



An Anthology of Selected Papers of APQN Annual Academic Conference

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Nov 25, 2021, Singapore
(Virtual Event)



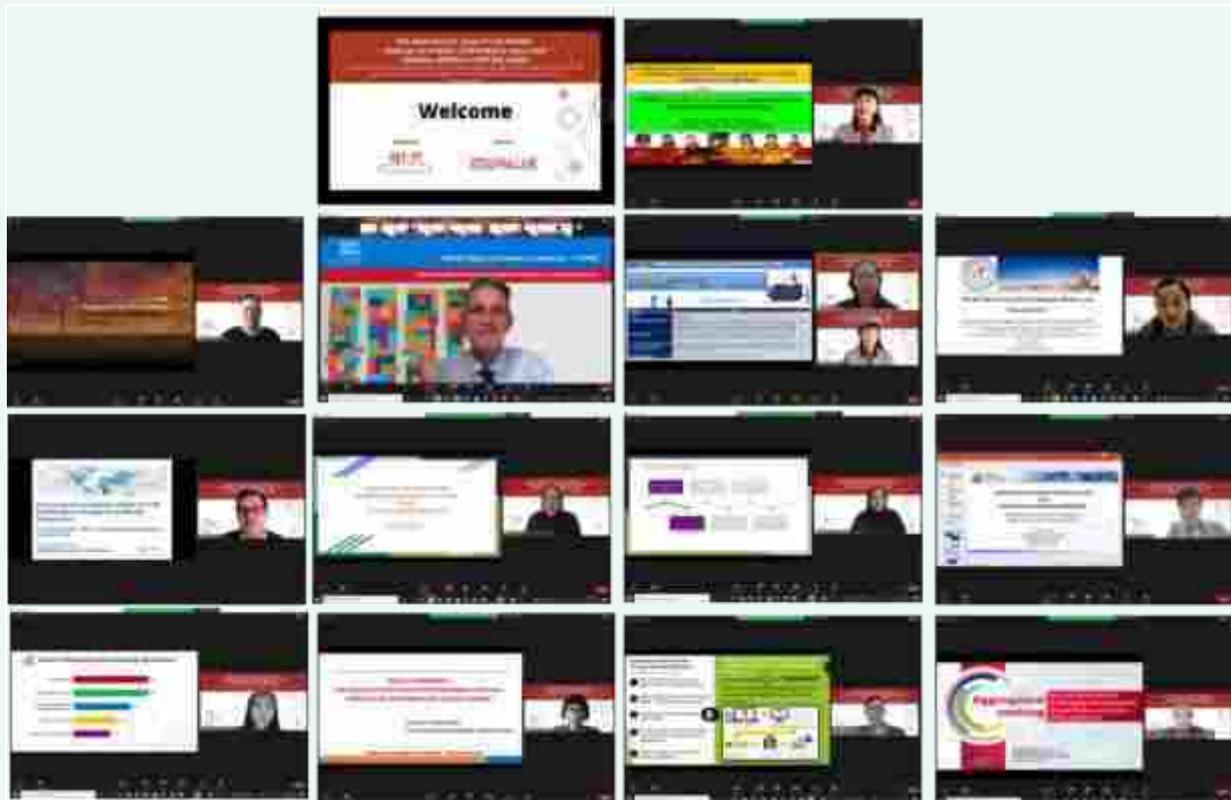
Asia-Pacific Quality Network (APQN)

Dissolving Boundaries for a Quality Region

Founded in 2003, the Asia-Pacific Quality Network (APQN) is a non-governmental and non-profit network who has been striving for “Enhancing the Quality of Higher Education in the Asia-Pacific Region” and "Dissolving Boundaries for a Quality Region". APQN has 250 members from 45 countries/territories, becomes the largest and the most influential international organization on higher education in this Region. APQN has played a crucial and unique role in improving the quality assurance mechanism, exchanging theory and practice experiences, promoting substantive co-operations, establishing Consultant Bank, reviewing Asia-Pacific Quality Register (APQR) and Asia-Pacific Quality Label (APQL) in this Region.

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New Dimension of International Reviewers to Promote Trust in External Quality Assurance in HEIs

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Abstract

The Quality Assurance Council (QAC) of the University Grants Commission in Sri Lanka took a creative initiative in their External Quality Assurance mechanism when they decided to include an international reviewer to the review panel of Institutional Reviews (IR), hitherto conducted by a panel comprising totally of local reviewers. The advantages are that the reviews become more transparent and objective offering potential for enhancing the quality of higher education to acceptable international standards. While it provides opportunities for the local reviewers and reviewed universities to learn from the international reviewers, the latter would be able to practice the fundamentals of QA in new settings which would be a challenge. The additional cost for this initiative could be justified by the benefits which are higher, while preserving the contextual basis of the review. While the QAC had all intentions of practicing this in future IR also, currently the effect of the pandemic has to be overcome and modifications to the QA procedure is being worked on to move forward on this important initiative.

I. Institutional Review (IR) in Sri Lanka

Background of QA system in Sri Lanka:

The QA system operational for the Sri Lankan State Universities under the aegis of the Quality Assurance Council (QAC) of the University Grants Commission (UGC) is with an External Quality Assurance (EQA) system and the Internal Quality Assurance (IQA) system in each University that works in tandem as shown in the figure below.

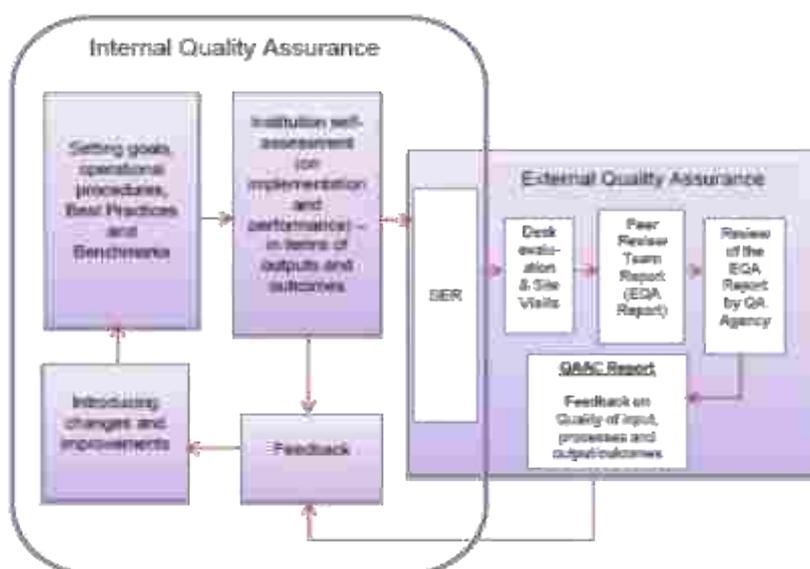


Figure 1 Functional link between the Internal Quality Assurance and the External Quality Assurance.

Summary of the First Cycle of IR:

The Institutional reviews (IR) was initiated in 2006 and the first cycle was completed with reviewer panels comprising totally of local reviewers. There was a guideline manual for the reviewers which evaluated Universities on 8 criteria.

II. New initiative in Second Cycle: Inclusion of International Reviewers

It is imperative that tertiary education provision and its quality assurance is an essential commodity to be ensured by any country that is aspiring to be in the global arena of higher education.

The UGC- the apex body in providing higher education and maintaining standards through its Quality Assurance Council (QAC), created a new dimension to the external quality assurance mechanism in its second cycle of IRs of Universities by the inclusion of an international reviewer to each reviewer panel. The primary objective of this initiative was to promote trust through transparency, enhance credibility and scope of the review and be accountable to all stakeholders in higher education.

While all local reviewers were professors and senior professors in the State University system and had the required credentials and experience to serve in the review panel, the QAC strongly believed that the inclusion of an international reviewer would heighten the trust of stakeholders in the IR which is conducted in a 6-year cycle.

International Reviewers:

Thus in 2018, two international reviewers successfully participated in 2 review panels of the IR of two of the State Universities together with the local reviewer panels while in 2019, 3 international reviewers successfully participated in the panels of 3 State Universities.

The reviewers were, Prof Jianxin Zhang from China (participated twice), Prof Oksana Matveeva from Russia, Prof. Karen Treloar from Australia and Dr. Tess Goodliffe from the UK. These reviewers possessed wide experience in quality assurance activities in their own countries as well as in the international QA arena.

IR Process in the New Cycle:

All reviewers (local and international) were provided with a self- evaluation report submitted by the University to be reviewed, written by them according to specific guidelines. All reviewers used the “Manual for Institutional Review of Universities and Higher Education Institutes in Sri Lanka” and submitted an individual desk evaluation report on a template provided by the QAC for this purpose before proceeding to the respective sites. The evaluation was on 10 criteria as specified by the review manual (shown below). The site evaluation was conducted under the guidance of the review panel chairman where the self- evaluation report submitted by the University on which the desk evaluation was done was validated by observing evidence provided by the University. The total site visit lasted six days.

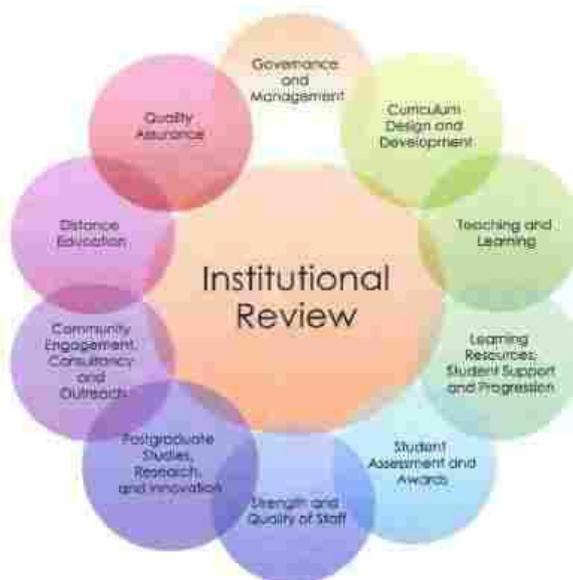


Figure 2: The Manual for External Review of Universities and Higher Education Institutes in Sri Lanka

A survey was conducted with local reviewers, international reviewers and the reviewed Universities of this review cycle, to determine the outcome and impact of the new initiative of including international reviewers. A sentiment shared by them is that, QAC, UGC, who took a bold decision to include international reviewers into the process of institutional review (IR), is one of the creative initiatives at this global and international era of higher education. Fewer countries in Asia-Pacific region do as Sri Lanka does in “*Thinking globally and acting locally*”

III. Beneficial Aspects of Inclusion of International Reviewers

The inclusion of international reviewers had the following beneficial aspects.

III a. They share experiences from their local context

- University education must have universal standards. If the Institutional review (IR) committee comprises only local members no comparison could be done with other universities in the world. Since the international reviewers do not know the local context adequately, they would be able to provide input in comparison with good universities overseas.
- Foreign members invited for the IR review panels are conversant with quality assurance processes of their own country. The feedback for the improvement of quality assurance process itself and best practices are also important for the improvement of the quality-the reviewers from China, Russia, UK and Australia shared their experiences as reviewers from countries where the QA mechanism has advanced to a stage higher than in Sri Lanka.
- The observation of facilities for teaching/learning/assessment also gave them opportunity to express their view on possible interventions that could be made to “modernize” learner and outcome-based education with new technology.
- It provided exchange of knowledge regarding international benchmarks, qualification frameworks and codes of practices and constructive mechanisms for the function of internal quality assurance units of universities
- Future trends in higher education are dynamic and recommendations for new directions for development of programs or orientation of existing programs are important to improve

competitiveness of local programs. Therefore, external feedback from foreign expertise is gainful.

- For example, as reported by the international reviewer on Open Education “Open learning (OL) is an educational philosophy in which particular value is attached to certain underlying principles such as openness; learner centeredness; flexibility in learning with respect to pace, time, place of study etc.; removal of unnecessary barriers to access; recognition of prior learning; technology to mediate learning; Industrial process; and Curriculum and courses in the public domain. The OL principles are quite different from those in conventional universities. Hence one cannot fit all reviews in to one format and it is not proper and even wrong to use the same criteria”. Thus, it was commended that the 10 criteria for OL covered all aspects of the university, and especially focused on open and distance learning.
- The views of the visitor may be important to have in a reviewer training also. Listening to views from a couple of international expert reviewers would be useful.

III b. Provide opinions in a more objective manner and advice the reviewed University

Sri Lanka being a small island nation where the academics serving as reviewers are known to each other well, this initiative was hoped to eliminate even the smallest bias in judgments and build sustainable stakeholder relationships while developing partnerships and working together in the important endeavor of providing higher education of acceptable international quality to students of diverse backgrounds and varied expectations.

- The expertise and experience of the international reviewers assisted to conduct the review more objectively since they would be reviewing a system which was less known to them but one where they were yet able to practice the fundamental principles of quality assurance.
- The review schedule included meetings with all potential stakeholders of the University and the visiting of university facilities which enabled it to serve as a higher education provider for the State. The international reviewer was able to provide feedback on the adequacy of manner in which the meetings were conducted –in order to obtain the “real picture” of the situation of the myriad of aspects that contribute to a total educational experience of students.
- In 2019, one of the IR was for the single Non -Conventional University in Sri Lanka which engages in Open Education. This too was of much value since it provided insight to this different mode of education delivery also.
- Experienced international reviewers help to build the confidence in the evaluation team by the university been evaluated. They lack any personal prejudice and hence they are most welcome by the University being reviewed.
- It also blends the international level quality expectation in to local reviews and improves the quality of local reviewers by sharing international expectations with respect to local standards.
- If local standards are good, this will be a good medium of propaganda.

III c. Contribute to the improvement of the standards of the QAC

- It provided the QAC, local reviewers and reviewed University to gain insight in to their views/comments on the types of documents that were expected to be shown – their appropriateness, and potential documents that could be provided for each criterion and the standards therein.

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- The following recommendations were also made by the international reviewers.
 - To reduce the repeated standards: At present, there are 10 criteria in 373 standards in OL. Among the 373 standards, there are quite a few which are repeated. For example, there are 5 standards which deal with internationalization (1.14; 2.24; 6.9; 8.1; 9.21), and hence in a future revision of the manual this aspect needs consideration.
 - To reduce the meetings and add more review methods:

The IR has over 30 meetings with different persons. It is true that “meetings” are one of the good methods. A look at the Manual of the IR (conventional universities), show that there are 7 types of the meetings which serve the 7 standards. The problems and limitations of the meetings are that time is limited: only 30 minutes; too many participants at a meeting - at one meeting participated there was 53 persons; lack of privacy: facing such a crowd of people, the interviewees are reluctant to speak out their minds; inefficiency and extra workload for the staff members: they came to the meeting but do not have any chance to speak which would be a waste of time.
 - Since now we have entered the fourth generation of evaluation, which means that reviews are “not to criticize”, “not to show off”, but “to negotiate” and “to reach the review objectives by proper methods” several suggestions were made such as to reduce the numbers of the meetings and add more creative methods. For example, the review methods of Asia-Pacific Quality Label adopt the qualitative review method, which mainly emphasizes the achievement of the following eight qualitative review techniques: (1) desk review with text analysis; (2) listening to report presentation; (3) field investigations and visits; (4) in-depth interviews; (5) focus groups; (6) listening to the lectures and observing teachers and students; (7) comparative analysis; and (8) problem diagnosis.
 - The reviewer also commended that the “*Manual for Institutional Review of Sri Lankan Distance Higher Education Institutions*” was well organized and served as a good guide for universities and other Higher Education Institutions to adopt and internalize good practices and standards in respect of quality assurance.
 - International reviewers commended certain practices adopted by the QAC which improved efficiency such as the pre-formatted Excel file that was provided before the site visit began, for each reviewer to assess the SER and assign scores for each standard, based on what is given in the SER and which was automatically calculated.
 - International reviewers also commended that the review process took place in a timely manner without any obstacles or conflicts. That the team members showed much enthusiasm, devotion and commitment and served as objective and impartial peers, maintaining high transparency and confidentiality of the procedure to all persons involved.
 - It also provided the opportunity to gain valuable insight regarding QA mechanisms in other countries. Hopefully it provided this opportunity to the administrative hierarchy, academics, support staff, alumni, industry partners and most importantly to students – the primary beneficiaries of QA reviews.
 - Assisted to formulate a list of recommendations that will be helpful for the further enhancement of the University and strengthen its reputation locally and abroad. Such recommendations as above would truly assist the QAC to orient better their focus regarding reviews.

IV. Challenges and Way Forward for the Inclusion of International Reviewers

IV a. Effect of the Pandemic

From 2020 when 5 international reviewers were scheduled to visit the country for the remaining Institutional reviews, the pandemic hit hard this innovative feature of the inclusion of international reviewers due to the restriction of all international travel. No reviews were able to be held even with the local reviewers due to the countrywide lockdowns.

Thus, it is imperative that the QAC needs to formulate a modified mechanism to obtain the services of international reviewers. This the QAC hopes to achieve by conducting the reviews in an online mode. Already all documentation – Self-evaluation report, marking templates for desk reviews, instructions on the provision of evidence as e-documents have been proposed and worked on. The possibility of virtual tours in the observing of facilities that would have to be factored in which the reviewed Universities would have to work on too to provide a realistic and fair “view” of their Institute since a site visit would not be possible. All meetings of course would need to be conducted in an online mode which is now realized as totally possible in an efficient and effective manner.

IV b. Financial Issues for the QAC

- The cost of having institutional reviewers is significant and has to be justifiable. In future online reviews this would be reduced as international travel and accommodation costs would not occur.

IV c. Unfamiliarity of the local QA system to the international reviewers

- Stakeholder engagement like many other aspects of education and quality assurance is context and culture specific. Hence extreme care had to be exercised in the selection of international reviewers who had to be experts in evaluation of Universities/Institutes, appreciated the diversity of students and staff and respected the values and norms of the culture and country at large.
- The arrival of the international reviewers very close to the site visit and driven straight to the University under review, gives them minimal time and inadequate information to understand the local context. In an online review since even this is not possible the local University would need to prepare documentation which provides the reviewers with adequate and realistic exposure to the context and surroundings.
- There should be discussions between local IR panel and the foreign expert before commencing the site visit process during the desk review time. Otherwise, it makes them depend on what the other reviewers inform them and hence guided by them rather than they be able to guide the locals in situations where their expertise would be important. The QAC would have to ensure adequate “discussion times” with international reviewers in future so that they are conversant with local university procedures and other QA matters.
- The persons should be well aware of the system operative in Sri Lanka and possess adequate experience in relation to international reviews.

IV d. Local reviewers dominate the review

A review is not the destination, but a process for quality enhancement, which needs endless improvements. Hence the following aspects would be worth of concern.

- When the team comprises 5 local and 1 international, the opinions of the visitor is not well heard, especially since a majority of the team are experienced persons.

-
- However, it is very important to select and appoint experienced and flexible reviewers, who would not try to impose or dominate.

IV e. Capability of the international reviewers

- Their profile had to be made available to the university to be reviewed in order to maintain transparency and to request their acceptance of the proposed reviewer.
- QAC should maintain a database of such reviewers who are willing to and work in Sri Lanka at a reasonable honorarium.

The QAC would continue to include international reviewers in future IRs too considering the positive responses received from local reviewers and reviewed Universities. In the future this would have to be continued in a modified atmosphere of online review due to the effects of the pandemic now and in future.

V. Conclusion

In an era where student mobility in higher education is ever increasing and recognition of qualifications and benchmarks have to go global, the QAC sincerely believe that this initiative marked an important milestone in QA of higher education in Sri Lanka and that it would also be an incentive to other nations who have yet not embarked on internationalizing their external review process so that trust could be ensured and promoted in a globalized context. The QAC is taking necessary actions to retain this feature in a pandemic affected world for the continuity of this good practice for the betterment of quality in higher education.

Author's Bio



Prof Deepthi Bandara is a senior professor at the University of Peradeniya, Sri Lanka. An Agricultural Biologist by discipline, in addition to her teaching and research, she has been a champion on teaching methodology, curriculum development, quality assurance and staff development, contributing immensely to the enhancement of Higher Education in Sri Lanka. She has served as a workshop leader in over 100 workshops for a range of audiences throughout Sri Lanka. She has been a consultant on World Bank assisted projects on higher education in Sri Lanka in the past 14 years working on innovations in teaching, learning and assessment, and fostering University-Industry partnerships for commercializing and dissemination of research.



Professor Jianxin Zhang is the 5th and 6th President (2016-2019; 2019-2022) of APQN, the largest and most influential non-profit/non-government organization in quality assurance of higher education in the Asia-Pacific Region. She is the Chief Expert of Yunnan Higher Education Evaluation Center (YHEEC), tenured professor of Yunnan University and Advisor of Council for CHEA/CIQG in USA (2012-2017). She obtained her PhD degree at Peking University in China, her Master degree at the Swiss Federal Institute of Technology (EPFL) in Switzerland. She was the visiting scholar in Asia-Pacific Program of Educational Innovation for Development (APEID) of UNESCO in 2008.

Academic Integrity in A Post-COVID World

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Abstract

Threats to academic integrity arising from academic misconduct are a serious concern in global higher education. Academic misconduct can take a variety of forms, one of the most significant is the use of essay mills. Typically, these are online platforms that sell bespoke work to students who will then submit this as their own. Essay mills operate from most nations and are used by students in every jurisdiction.

While concerns arising from the use of essay mills existed before COVID-19, moves to online and remote learning have exacerbated these. Essay mills have also targeted students through their preferred communications channels, exploiting their anxieties and vulnerabilities. This proposal looks at three initiatives put into effect by QAA to support the UK higher education sector take action against academic misconduct. While implemented in the UK, they have global applicability and relevance. They are enhancement based rather than regulatory approaches, focusing on student support and staff education, as well as considering areas such as assessment design and the use of technology. Members of the Asia-Pacific Quality Network will be able to use the suggested approaches when considering how best to protect and promote academic integrity in their own jurisdiction.

1. Introduction

The protection and promotion of academic integrity presents challenges for higher education providers, quality assurance agencies and governments across the globe. A particular threat to academic integrity arises from academic misconduct.

Academic integrity is a code of practice generally adopted and accepted by higher education institutions, systems and stakeholders. It is largely understood worldwide and encompasses a range of values relating to honesty and rigour in academic activities. The International Centre for Academic Integrity in the USA, defines academic integrity as 'a commitment, even in the face of adversity, to six fundamental values: honesty, trust, fairness, respect, responsibility, and courage'

Academic misconduct refers to practices that are not in keeping with these values and this commitment. It can manifest in a variety of forms including:

Fake certification and diploma mills - these have been around for more than 20 years. Some of the typical examples are fake institutions, often with names similar to reputable institutions, issuing awards for 'life experience' to outright forged certificates and qualifications and so called 'novelty degrees'.

Inappropriate or fraudulent degree validation - HE providers that have validation arrangements with dubious or even illegal overseas partner institutions. This problem has led to high-profile abolitions of universities in a number of countries.

Admissions fraud - this can include misrepresentation of required credentials, forged recommendation letters, and fraudulent transcripts. These issues can be exacerbated by lax or inappropriate admissions practices.

Exam fraud - this can include fake identity or impersonation, the use of smuggled notes, and using new technologies - for example, hidden cameras and radio earpieces to record or transmit live assessments for sale. Moves towards remote examinations following the COVID-19 Pandemic have seen an increase in concerns that students can use real-time tuition services to assist them in exams.

Essay mills – essay mills are a form of contract cheating, where a third party is commissioned, or service purchased, to produce an essay which the student subsequently submits as their own work. This type of ghost-writing is not new. However, in the last two decades a massive growth of online availability of essay mill services has made their use a serious concern regarding the protection of quality and standards in global higher education.

QAA works extensively across the UK higher education sector, and with global partners, to protect and promote academic integrity. While all of the forms of academic misconduct listed above raise significant concerns, our focus has primarily been on the use of essay mills. We see this as the most significant current threat to academic integrity, one that has grown as a consequence of COVID-19. This proposal sets out some of the work that QAA has undertaken in the UK, and which has direct relevance to the Asia-Pacific region and across the globe.

2. How widespread is the use of essay mills?

Due to the nature of academic misconduct, it is impossible to state with accuracy how many students use essay mills. There is published research, which is indicative of scale, but this is acknowledged by the authors to require some level of assumption.

A 2018 study by Professor Phil Newton of Swansea University in the UK indicated that between 2014 and 2018 the percentage of students internationally admitting to paying someone else to undertake their work was estimated at 15.7%.¹

More recently, research led by Dr Guy Curtis from the University of Western Australia published in 2021, estimated that around 8% of students in Australia buy ghost written assignments.²

Although not based on academic research, essay mill comparison sites offer indications of both scale and demand. As at November 2021 the site UK Top Writers³ listed 1020 separate essay mill writing services. This number is increasing by approximately 15-20 each month. Even this figure is likely to be conservative, with estimates of the true number of sites around double this figure.

Essay Mills often operate sophisticated marketing functions, targeting students through their preferred social media channels. Essay mills will even seek to embed themselves on institutional websites, so that students will believe that they are accessing a site that has been endorsed by their

¹ Frontiers | How Common Is Commercial Contract Cheating in Higher Education and Is It Increasing? A Systematic Review | Education (frontiersin.org)

² Self-confessed cheats ‘the tip of the iceberg’ | Times Higher Education (THE)

³ Best Essay Writing Services (September 2021) | UK Top Writers

institution. Earlier this year QAA and Jisc⁴ issued joint guidance for the UK higher education sector to support them defend against such intrusions into their cyber security.⁵

3. What action can be taken to protect academic integrity?

One of the many consequences of COVID-19 has been to increase threats to academic integrity.⁶ The pandemic has left students in all countries vulnerable and isolated. Vulnerable and anxious students are more likely to be susceptible to marketing by essay writing services. They are also more likely to be removed from their peer and academic service support.

QAA's campaign to protect academic integrity has seen us call for legislation to criminalise essay mills. This would not only make it possible to prosecute UK based companies, but will make it more difficult for essay mills from any nation to use Google, Facebook, YouTube, PayPal or other common online platforms for their marketing. In addition, criminalisation will help prevent internet service providers hosting essay mill sites.

In October 2021, the UK Government announced it was to take action to criminalise essay mills in England. Provisions to do so have been introduced to the Skills and Post-16 Education Bill currently before the UK Parliament.⁷

While this is a positive step, essay mills remain a threat in other jurisdictions such as Australian and Ireland, which also have criminal legislation. QAA maintains that the most effective way to combat academic misconduct is at institutional level, and has undertaken a range of activity to support the UK higher education sector adapt to this threat during COVID-19.

The section below sets out some of the key activities undertaken during this period, primarily relevant to the conference subtheme-2 'Academic Quality: Shift in Pedagogy and Frameworks'.

The resources listed below were published specifically to assist the UK higher education sector. However, they have applicability across higher education systems and jurisdictions. The guidance and principles will be as relevant to counties in the Asia-Pacific region as they are in Europe.

The proposed presentation at APQN 2021 would look at some of the common themes, practices and guidance, and suggest ways in which they could be practically applied in the Asia-Pacific region.

The three examples listed are not a comprehensive overview of the work QAA has undertaken in this area since the arrival of COVID -19. However, with a 15-minute slot available for presentations, we have selected three initiatives that we feel demonstrate how approaches to enhancement frameworks and pedagogy have adapted.

1) Supporting the sector following moves to online assessment

⁴ <https://www.jisc.ac.uk/>

⁵ <https://www.qaa.ac.uk/news-events/news/qaa-and-jisc-join-forces-to-advise-heis-how-to-counter-cyber-security-threat>

⁶ <https://www.theguardian.com/education/2021/feb/10/cheating-on-the-rise-in-uk-universities-during-COVID-say-researchers>

⁷ <https://www.gov.uk/government/news/essay-mills-to-be-banned-under-plans-to-reform-post-16-education>

In early Spring 2020, there was rapid pivot to online provision and assessment as a consequence of COVID-19. Campuses emptied and students had to quickly adapt to remote learning. Shortly after this in May 2020, QAA published ‘Assessing with Integrity in Digital Delivery’.⁸

The study looked at the potential for increased risk of contract cheating and the use of essay mills during online study. It considered actions higher education providers could take to reduce opportunities to cheat, particularly looking at ways in which students could be supported. Other areas covered in the guidance included the promotion of positive academic practices, whistleblowing policies and the use of technology.

2) Guidance for higher education providers to help them address essay mills and contract cheating

In June 2020, QAA published guidance for UK higher education providers ‘Contracting to Cheat in Higher Education: How to Address Essay Mills and Contact Cheating’.⁹

Work to produce the guidance began in late 2019, before the global impact of COVID-19 had been felt. It was an update of earlier guidance published in 2017. An updated edition was considered necessary as there had been significant changes in the way essay mills operated, and an evolution of the threats they offered. The guidance was updated following a survey of QAA members and students, with input from expert academics. The content was then adapted to allow for the impact of COVID-19.

The contents were designed to be applicable to all types of higher education provider, and to have applicability in all jurisdictions. When published the guidance was endorsed by Government Ministers from countries across the UK

The areas covered in the guidance covered; education and training for staff, education for students, how to reduce opportunities to cheat, detecting academic misconduct and the use of regulations and policies.

The key findings and recommendations of the guidance were that:

- Essay mills operate effective marketing techniques that use the channels preferred by students. QAA is increasingly hearing of practices such as blackmail and extortion.
- Identifying a strategic lead with responsibility for staff training and institutional coordination can help improve detection of essay mill use.
- Assessment design can help reduce opportunities to cheat, but no assessment should ever be considered cheat proof.
- Technology can help detect the use of essay mills, but is most effective when used by experienced staff with knowledge of the student.
- Essay mills have sought to exploit students who are feeling vulnerable or anxious, particularly during the COVID-19 pandemic. Effective institutional and peer support can help.
- Staff and students should be aware of, or be able to easily access, information and procedures to follow to report a suspicion of academic misconduct.

⁸ <https://www.qaa.ac.uk/docs/qaa/guidance/assessing-with-integrity-in-digital-delivery.pdf>

⁹ <https://www.qaa.ac.uk/docs/qaa/guidance/contracting-to-cheat-in-higher-education-2nd-edition.pdf>

3) The Academic Integrity Charter

Following the publication of the ‘Contracting to Cheat in Higher Education’, QAA used the content as the basis for developing an Academic Integrity Charter.¹⁰ All UK higher education providers have been invited to sign up to the Charter, as a demonstration of their commitment to the protection and promotion of academic integrity. The Charter was launched in October 2020 and currently has 176 signatories.

The Charter has no regulatory remit, and compliance by signatories is not assessed. Instead institutions are free to determine how they wish to meet the principles, subject to such factors as their size and available resource. It contains seven principles that signatories commit to. These are:

- All members of a higher education providers community are responsible for upholding academic integrity.
- Taking a holistic ‘whole community’ approach covering all aspects of provision.
- Making a commitment to working together as a sector.
- Engaging with and empowering students.
- Engaging with and empowering staff .
- Having consistent and effective institutional policies and practices.
- As autonomous institutions, UK higher education providers are the first line of defence to protect academic integrity.

4. Conclusion

There is no simple or single approach or solution to protect and promote academic integrity. Ensuring that students are supported, and that staff are well trained is as important as assessment design and effective use of plagiarism software.

The principles and proposals contained in the three initiatives in this proposal have been shaped by COVID, but will continue to have relevance in a post-COVID world.

The general enhancement based, and non-regulatory nature, of these projects means that they can be more easily applied in all jurisdictions. They would provide significant benefit in supporting higher education stakeholders in the Asia-Pacific region to manage threats arising from academic misconduct.



Author’s Bio

Gareth joined QAA in October 2016. He is responsible for QAA’s policy, public affairs and media relations. He originally practiced as a solicitor specializing in criminal defense advocacy. In 2002 he was appointed as Policy Director at Liberty, the UK’s leading human rights and civil liberties campaigning organization. In 2009 Gareth joined TACT, the UK’s largest fostering and adoption children’s charity as Executive Director of Policy, Communications and Fundraising. Gareth leads QAA’s work to protect and promote academic integrity. He is Chair of the UK Academic Integrity Advisory Group, and also Chairs ENQA’s recently formed working group on Academic Integrity..

¹⁰ <https://www.qaa.ac.uk/about-us/what-we-do/academic-integrity/charter>

Aggregated Ranking as a Tool for Quality Evaluation and Positioning of Asia-Pacific Universities at the Global Level

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Abstract

The paper presents the results of research into eleven most famous global institutional rankings and the analysis of their key characteristics. The authors suggest a new results aggregation method of education evaluation (rankings, accreditation), i.e., the method of league analysis, which is used to build the Global aggregated university ranking. The method relies on a variety of approaches used for the evaluation of university achievements, reduces subjectivity in evaluation and presents a position a university occupies at the global, regional and national levels. Such information may be used to shape the national educational policy, and to monitor the progress of the world's leading universities and national educational systems.

1. Introduction

Building global rankings of higher education institutions is a relatively new trend in globalization and internationalization of higher education. Due to the growing interest of the academic community in this issue the number of global rankings is increasing, primarily as a result of the emergence of new rankings in the developing countries, and the expanding activity of the existing ranking agencies, which include more and more higher education institutions in ranking procedures.

According to the IREG Observatory on Academic Ranking and Excellence (IREG), there are currently more than 100 academic rankings in the world: international, national, regional. The first national university ranking emerged in the United States in 1983 as a response to image and economic challenges. The first global ranking is considered to be the ranking released by Shanghai Jiao Tong University and called the Academic Ranking of World Universities (ARWU) or the Shanghai Ranking. The development team aimed to identify the world's best practices in higher education in order to study and apply them at the national level and thus to raise the quality and competitiveness of the Chinese educational system. China used the benchmarking for political purposes in order to strengthen the reputation branding of the country at the international level. The developing countries (Russia, the UAE, Turkey, etc.) are following the same path at the moment and are beginning to release their global rankings, which include HEIs from the developing countries in addition to elite American and European universities.

The IREG listing contains 17 Global University Rankings, which are developed and maintained by various organizations, mostly by specialized university laboratories.

The terms "global ranking" and "world ranking" have not been clearly defined yet. But they are actively used in the system of education. Neither there is a clear definition of the concept of "world university" (all universities have national affiliation) and in most cases the established concept of "world-class universities" is meant (Salmi J., 2016) As a rule, global and world rankings are understood as rankings which include higher education institutions from different countries. In the absence of a global (supranational) organization to conduct comparative studies of universities from different countries, the subjects of the rankings are organizations that have their national identity and promote their national interests. However, it must be recognized that the same universities

objectively occupy different positions in different global rankings, since the agencies offer different methods of ranking construction.

The purpose of this research is to analyze the goals and principles of building global rankings, to develop the methodology for building a uniform aggregated global ranking, and to identify the position of Asia Pacific Universities at the global level.

2. Analysis of goals and principles of building global assessment systems

Eleven global academic rankings were selected for the research. All these rankings were to meet the following criteria: stability (the ranking has existed for more than three years), frequency (the ranking is published annually), mass character (over a thousand universities from all the continents are included in the ranking), publicity (all information is publicly available).

Along with the economic and image goals of ranking compilation, the political goal to increase the competitiveness and attractiveness of the national education system as a whole, rather than that of individual universities is becoming more and more pervasive. Accordingly, the more universities in the country are included in the global rankings, the more competitive the national educational system is. This explains why the state education authorities of individual countries (especially those of the developing countries) urge their universities to participate in the rankings.

The analysis of the number and share of national universities located in the country where the ranking agency is located clearly shows there is an emphasis on national interests. This may be due to a lack of awareness or interest on behalf of universities themselves to participate in the rankings built by other countries.

Rankings use statistical information from databases and an expert assessment of the university's reputation. Both require sufficient financial and human resources from ranking agencies. The analysis showed that these agencies, as a rule, are not state organizations, they are usually funded by publishing companies or universities, including through the provision of additional consulting services. At the same time, the example of ARWU with obvious political and financial support of the Chinese Government, as well as the example of Moscow Ranking MosIUR show how quickly and on what scale the launch of a new global ranking can be carried out.

Most of the existing ranking companies that take into account scientometric data, with the exception of ARWU, actually use one of the two databases: Web of Science (WoS), owned and developed by Clarivate Analytics (until 2016 – Thomson Reuters), or Scopus, owned and developed by Elsevier Publishing Corporation. WoS mainly uses English-language texts in biology, psychology, medicine, physics, astronomy, economics, to a lesser extent in law, political science, mathematics and computer science. The Scopus bibliographic and abstract database was developed in 2004 on the basis of the Science Direct platform of Elsevier Publishing Corporation (founded in 1880 in Amsterdam), one of the four system-forming scientific publishing houses in the world along with Springer, Wiley, Informa. It publishes about a quarter of all scientific journals.

Thus, academic rankings focus primarily on the scientific activities of universities, evaluating research outcomes (publications, their citations, patents), outstanding achievements of teachers and students. Much less attention is paid to the third mission (service to society), and most often through the prism of the impact of scientific research on the regional (national, international) labor markets and economic sectors. There is practically no assessment of the quality of education. For example, the results of comparative studies of students' achievements (academic contests, competitions, grants, etc.) are not included in the evaluation due to the obvious insufficiency of such studies at the

global level, few participating countries and the lack of databases on the results of achievement assessment. At the same time, it is the quality of education that should be the main indicator of the effectiveness and the quality of a university's performance.

Ranking agencies are reluctant to disclose information about their activities, particularly concerning organizational and financial operation, as well as information about the methods of calculating and the indicators used. In most cases the calculations use weight coefficients for indicators that are subjectively selected by the agency. The conclusion is obvious: with some general approaches to evaluation the reputation and activity of a university, the calculation methods vary from ranking to ranking, therefore, the results for a particular university may also vary significantly. That is why the same university can take completely different positions in different rankings. As a rule, the same 10% of all higher education institutions are found in most global rankings. It is not only because they are the best, but rather because they are more active.

Another important criticism of the existing rankings is that these evaluation systems lack an important element – the site visit, which verifies the documented data and above all, gives a holistic three-dimensional picture of the university's activities: educational, research, international, and others. The site visit is an essential component of any accreditation procedure.

Given certain limitations of rankings in terms of evaluating universities, the International Partnership Issues Groundbreaking Principles on Ranking of Higher Education Institutions, the agreement officially adopted at the second conference of the International Association IREG (Berlin, May 18-20, 2006) states: "when correctly understood and interpreted, they (rankings) contribute to the definition of "quality" of higher education institutions within a particular country, complementing the rigorous work conducted in the context of quality assessment and review performed by public and independent accrediting agencies" . If the objective is set to evaluate and improve the quality of education, then even the most reputable rankings cannot be considered as the only indicator of quality, moreover, they act as a supporting indicator. But such a remark is valid provided the two conditions are met: accreditation agencies are recognized at the international level, and these agencies have open databases of their accreditation procedures (Motova, Navodnov, 2019).

There is only one international database of higher education institutions and programs accredited by agencies recognized at the European level - the Database of External Quality Assurance Results (DEQAR) which is supported by the European Union's Erasmus+ program through different projects. This database includes only those universities and programs that have been accredited by an accreditation agency included in the European Quality Assurance Register EQAR. It means that the agency has undergone international review and proved its compliance with the European standards (ESG) and as a result of this recognition, was granted the right to carry out international accreditation procedures regardless of the location of a higher education institution. The international recognition of the agency is an important condition to ensure the consistency of its activities and the quality of the accredited universities and educational programs.

Despite the fact that DEQAR is a European project, and currently contains information on universities from 43 countries of the European higher education area, it can still be called global. The DEQAR database (as of September 1, 2021) contains information about 2,797 accredited universities from the European Higher Education Area (EHEA) and about 119 universities from 39 countries that have been accredited by the agencies recognized by EQAR, including 43 universities from 13 countries of the Asia-Pacific region.

It is important to mention that accreditation procedures, unlike rankings, include site-visits, and thus validate documented findings in all the key areas of a university's activity.

3. Methodology. Principles for building a global aggregated ranking

Rankings have recently gained in popularity for obvious reasons: they provide users with information which is clear, simple, and easily accessed, and they help users make decisions regarding their studies, work, investments or political ambitions. However, the question of how to get a more objective picture using a variety of different approaches and taking into consideration a number of subjective opinions in the assessment still remains unanswered. Is it possible to build a "consolidated ranking" that could act as a reference ranking scale? A new method of league analysis "MetALeague" could be a feasible solution. The main principles of the ranking aggregation methodology are as follows:

- There are definite criteria for selecting global rankings used to build an aggregated ranking: stability, publicity, frequency, mass character. For our research we have selected eleven global rankings included in the listing of IREG Observatory on Academic Ranking and Excellence. The methodology could be extended to other rankings, and most importantly, other global assessment systems if any. For the purpose of our research, we have also used the Database of External Quality Assurance Results (DEQAR).
- Rankings are converted into league tables. This approach makes it possible to consolidate totally different ways of university assessment and take a comprehensive look at the system from different perspectives. The rating scale is designated by letters: A, B, C, D, ...
- The McKinsey-Abel vector approach is used for aggregation. According to this approach, the position of the university in various rankings is characterized by vector assessment.
- In order to build a consolidated league table, we use the mathematical apparatus of the Theory of voting in small groups, i.e., Borda's convolution (Emerson, 2013), plurality, etc., rather than linear combination with weighting factors.
- We introduce new "weak" convolutions, i.e., we do not use all the ranking results, but only a certain number of the best ones. In our research we have used 7 out of 12.

According to Webometrics.info data, there are at least 25 thousand higher education institutions in the world. Taking into account all the universities represented in the sample of eleven rankings, their number comprised 2,930 higher education institutions from 120 countries, i.e., a little over 10% of the total number. The fact that these 10 global academic rankings are included in the 10 % is a significant accomplishment. We can call this sample TOP 10, i.e., 10% of the best world-class universities.

When building an aggregated ranking, it is important to determine the number of leagues into which all higher education institutions will be divided. There is a well-established practice of dividing scientific journals into four quartiles. In the case of global ranking, we divided higher education institutions into seven leagues:

- TOP-1 (1% of the best universities in the world) includes about 250 universities;
- TOP-2 (2% of the best universities in the world) includes 500 universities with 250 universities from TOP-1;
- TOP-3 (3% of the best universities in the world) includes 750 universities;
- TOP 4 includes 1,000 best universities in the world;

- TOP-5 includes 1,250 best universities in the world;
- TOP-10 (10% of the best universities in the world) included in the global rankings;
- TOP-15 (15% of the best universities in the world) included in the global rankings.

The choice of one percent of the best universities as the leaders at the global level is as prestigious as the choice of top 100, moreover, it is more accurate if we take into account the number of universities under consideration. We argue that this is a more justified scale to analyze the positioning of universities in global and/or other rankings. And a more correct strategic objective for universities is on being included in the top 1% of the best universities in the world rather than top 100.

The TOP group can rank universities in descending order of the Board index. Based on this method we assessed 2,930 higher educational institutions included in the global aggregated ranking. The Global Aggregated Ranking (GAR), built on the basis of the league analysis methodology, provides ample opportunities for analytical research. One of its possible applications is to analyze the positioning of universities in certain countries: the number of universities in the country included in the ranking and their distribution by leagues (Table 1).

	TOP distribution								No of HEIs in the country ¹	Percentage in the GAR (%)
	Total in GAR	TOP-1%	TOP-2%	TOP-3%	TOP-4%	TOP-5%	TOP-10%	TOP-15%		
China	399	23	28	36	28	27	251	6	1,062	37.5%
United States	383	72	56	38	31	17	169	0	2,120	18%
Japan	153	8	7	7	13	14	103	1	765	20%
France	139	12	8	7	17	21	73	1	408	34%
India	137	0	4	6	5	11	108	3	812	17%
United Kingdom	109	26	14	18	14	11	26	0	248	44%
Russian Federation	108	1	8	6	5	8	78	2	578	18.5%
Germany	93	19	25	10	4	8	27	0	359	26%
Turkey	82	0	0	6	7	4	65	0	173	47%
South Korea	78	7	6	10	6	6	42	1	248	31.5%
Brazil	74	1	5	2	8	7	50	1	1,048	7%
Italy	68	9	16	10	10	4	19	0	100	68%
Spain	66	5	12	9	14	6	20	0	112	59%
Poland	64	0	2	5	11	10	36	0	349	18%
Iran	56	0	2	5	7	5	37	0	263	21%
Chinese Taipei	55	1	4	9	1	3	36	1	142	39%
Canada	53	10	9	5	3	2	24	0	141	37.5%
Australia	39	8	16	5	3	5	2	0	94	41.5%
Egypt	28	0	1	0	4	2	21	0	55	51%
Pakistan	28	0	0	1	2	1	24	0	154	18%

(Table 1. Ranking of countries/territories by the number of universities listed in the Global Aggregated Ranking-2021 (as of 2020). Top-20 countries are listed below. The results for other countries are available on www.best-edu.ru. (1. according to the World Higher Education Database <https://whed.net/home.php>)

Through the use of specially developed software the suggested ranking allows sampling and comparative analysis of two or more countries. For example, let us take HEIs in the Asian region (Table 2).

Country/territory	Total	TOP 1%	TOP 2%	TOP 3%	TOP 4%	TOP 5%	TOP 10%	TOP 15%	No of HEIs in the country	%
China	399	23	28	36	28	27	251	6	1,062	37.6
Japan	153	8	7	7	13	14	103	1	765	20.0
India	137	0	4	6	5	11	108	3	812	16.9
Russia	108	1	8	6	5	8	78	2	578	18.5
Turkey	82	0	0	6	7	4	65	0	173	47.4
South Korea	78	7	6	10	6	6	42	1	248	31.5
Iran	56	0	2	5	7	5	37	0	263	21.3
Chinese Taipei	55	1	4	9	1	3	36	1	142	38.7

Pakistan	28	0	0	1	2	1	24	0	154	18.2
Malaysia	26	1	3	1	1	1	19	0	81	32.1
Saudi Arabia	23	2	1	1	0	1	18	0	71	32.4
Kazakhstan	19	0	0	1	2	3	13	0	112	17.0
Thailand	17	0	2	0	2	3	10	0	146	11.6
Iraq	14	0	0	0	0	1	13	0	94	14.9
Indonesia	13	0	0	0	2	2	9	0	1,258	1.0
Israel	10	4	1	2	0	0	3	0	58	17.2
Lebanon	8	0	1	0	0	2	5	0	39	20.5
Jordan	8	0	0	1	0	1	6	0	31	25.8
UAE	8	0	0	1	1	1	5	0	53	15.1
Vietnam	8	0	0	0	0	0	8	0	172	4.7
Philippines	7	0	0	0	0	1	6	0	1,332	0.5
Singapore	6	2	0	0	0	2	2	0	9	66.7

(Table 2. Ranking of countries/territories by the number of Asian universities listed in the Global Aggregated Ranking-2021, as of 2020)

Table 3 shows the leading universities worldwide distributed by their locations

Continent	Total	TOP 1%	TOP 2%	TOP 3%	TOP 4%	TOP 5%	TOP 10%	TOP 15%
Asia	1,302	54	67	97	84	101	884	15
Europe	1,061	118	119	98	115	105	502	4
North America	472	83	65	45	35	21	223	0
South America	256	1	8	6	12	13	115	1
Africa	118	2	4	1	8	10	93	0
Oceania	48	9	19	8	4	5	3	0

(Table 3. Ranking of countries by the number of universities located in different continents and listed in the Global Aggregated Ranking-2021 (as of 2020)

4. Conclusions

The construction of the Global Aggregated Ranking (GAR) makes it possible to understand how universities are positioned at the international level. The use of generalized results of several different rankings can significantly enhance the credibility of quality assessment of every university and provide a more comprehensive picture of its achievements.

The results of various global rankings and quality assessment systems consolidated into one database make it possible to carry out a comparative analysis of a country's universities and national educational systems, to follow the dynamics of their achievements, to monitor the effectiveness of financial contributions, to make forecasts and strategic planning of higher education development (Bolotov et al., 2019).

The paper may be of interest to national education authorities and national governments responsible for the strategic planning of higher education development.

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Online Teaching Survey of Southeast Asian Students in Kunming Medical University during the COVID-19 Pandemic

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Abstract

The COVID-19 pandemic has changed the way of medical education is delivered worldwide. This paper investigates the online teaching situation of Southeast Asian students in Kunming Medical University, and gives incorporated teaching and learning strategies for these students. In order to ensure the quality of network teaching, some suggestions on the development of medical education were put forward.

According to the World Health Organization, the COVID-19 has caused a global pandemic since 2020, with outbreaks occurring in more than 200 countries. The pandemic affected all areas of life, including education and health services (Al Samarae A, 2020). There are currently 110 foreign students in Chinese teaching in Kunming Medical University (KMU). Before the COVID-19 outbreak, these students were assigned to different majors to study with Chinese students. As the COVID-19 outbreak, these students could not return to Chinese campus, they have to do online learning. This paper investigates the online teaching situation of Southeast Asian students in KMU, and gives suggestions on network teaching quality assurance.

1. Network teaching process and implementation of the questionnaire

The teaching platform mainly used Dingding, Xuexi Tong and Dui Fenyi for Southeast Asian students in KMU. They study by online teaching or Video recording learning. The student's attendance is supervised through the teaching platform. The teachers release homework on the teaching platform. At the end of each unit, there will be tests to evaluate students' learning.

In the final of 2020, the anonymous questionnaires were conducted among pre-clinical stage foreign students in Kunming Medical University by using wechat program "Questionnaire Star".

2. Results of the survey

2.1 Study participants characteristics

The respondents include 90 foreign students, and more than half of the participants were male (59%; n=53). The sample participants were between 18 and 20 years old. Most of participants were from Laos (58%), Myanmar (14%), Vietnam (13%) and Chinese Taipei (13%). More detail in table 1.

Characteristics	Frequency (n)	Percentage (%)
Gender		
male	53	59
female	37	41
Pre-clinical Years		
Year 1	25	27
Year 2	32	36
Year 3	33	37
Nationality		
Laos	51	58
Myanmar	13	14
Vietnam	12	13
Bangladesh	1	1
Chinese Taipei	12	13
Thailand	1	1

Table 1 Characteristics of the questionnaire respondents (N=90)

2.2 Network teaching opinions of the respondents

During the analysis, sub-themes were identified and classified under four major themes, which are summarized below with results analyse from the participants. Four core themes included the following: teaching platform, learning methods, teaching duration and preferences for teaching methods, as indicated in table 2.

Items	Frequency (n)	Percentage (%)
Favorite teaching platform		
Ding Ding	75	83
Dui Fenyi	10	11
Rain class	2	2
Xuexi Tong	3	3
Favorite learning methods		
Online learning	14	15
Video recording learning	18	20
PPT or videos and do exercises	56	62
Flipped classroom learning	2	2
Most suitable teaching duration		
2 hours	16	18
1 hour	44	49
30-15 minutes	10	11
The duration is changeable	20	22
Prefer of teaching modes		
Online teaching	11	12
Traditional classroom teaching	40	44
Blended teaching (online and offline)	39	43

Table 2 Network teaching opinions of the questionnaire respondents (N=90)

As table 2 results show that students prefer traditional face-to-face teaching (44%) or online and offline mixed teaching (43%), whereas only 12% of the students think online teaching is the best. This result indicates that some students lack self-control ability and are easily disturbed by surrounding factors, so they cannot devote themselves to online classroom learning on time. Even a small number of students are limited by family environment, such as lack of internet or unstable network signal, resulting in poor online learning effect. On the other hand, in order to improve online teaching, teachers should adjust the online teaching content according to the course syllabus, mainly teach the key points and difficulties of the course, and after class should reserve sometime to interact with students or answer questions. In a word, teachers should make full use of all kinds of teaching methods to stimulate students' interest in autonomous learning and guide them to consolidate knowledge points from simple to profound, so as to achieve effective mastery of knowledge points.

3. Strategies and suggestions of online teaching

According to the survey results (table 2), we suggest online teaching for Southeast Asian students should consider the learning ability of different students, and the operation mode of online teaching

should match the learning ability of students as much as possible. At the same time, a single online video should not be too long for avoiding visual fatigue. The duration of each online teaching should be limited to less than one hour. To improve teaching effect, it is necessary learning supervision and teaching interaction should be strengthened during online teaching.

Blended teaching (online and offline) has become the mainstream of global higher education, as the COVID-19 pandemic has accelerated the growth of online teaching (Sandars J and Patel R, 2020). In order to ensure the educational quality, we should innovate online teaching modes and improve the online evaluation mechanism in the future.

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Professor YU Jianyun studied Trauma Brain Injury (TBI) at the Brain Trauma Research Center of Pittsburgh University in USA from 1997 to 2000, gained his Ph.D in 2007 from Kunming Medical University (KMU). He has worked in KMU since 1984. His research interests are behavioral disorder of TBI in animal model and Higher Education Quality Evaluation (HEQE). He has published more than 160 papers on the two fields. As a key member, he took part in the establishment of Forensic Medicine Department of KMU and was the Director of Department of Forensic Pathology Teaching and Research, the Vice Director of the Science and Technology Department and the Vice Dean of Kunming Medical College. Now he is the Director of the Education Quality Assurance and Evaluation Center of KMU, the Director of the Higher Education Research Institution of KMU, the expert of HEQE and the Director of The Higher Medical Education Evaluation committee in Yunnan Province.



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Application and Exploration of Information Digitization Technology in the Quality Assurance Project of Improving Postgraduate Dissertation

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Abstract:

With the continuous development of information digitization in all walks of life, Shanghai is also actively exploring and optimizing the evaluation process and evaluation methods of supervisory control of anonymous evaluation before replying and postgraduate dissertation sampling inspection after graduation in the process of building a multiple link postgraduate training quality assurance system, so as to realize the function orientation of evaluation and its transformation in the improvement of information digitization technology. Therefore, taking the postgraduate dissertation sampling inspection as a typical example, studying and exploring the reform measures and the development and application of value-added evaluation methods of Graduate Dissertations quality assurance project in the process of information digitization transformation have a practical significance to promote the all-round development of Graduate Dissertations quality assurance system.

Key words:

Digitalization of Information; Postgraduate Training Quality Assurance System; Postgraduate Dissertation Sampling Inspection; Value-added Evaluation

The information digitization of education industry is not only the digitization process of educational resources and information, but also the continuous transformation process of education industry. At the national level, the overall plan of evaluation reform puts forward the principles and policies of making full use of information technology, exploring value-added evaluation and promoting the reform of key areas of education evaluation to achieve substantive breakthroughs; At the level of Shanghai, encourage and guide third-party evaluation institutions to actively adopting information-based means, organically combine the quality of dissertations with discipline evaluation, and build a closed-loop quality assurance system for postgraduates.¹¹ This paper will explore the evaluation process, the development and application of evaluation methods, the orientation and transformation of evaluation functions of postgraduate dissertation sampling inspection in Shanghai which is a solid force to promote postgraduate training quality assurance system which is driven by the development of information digitization technology. In order to provide some opinions and suggestions for the construction of postgraduate training quality assurance system in the future.

¹¹ Circular of Shanghai Municipal Commission of education on Further Strengthening the construction of quality assurance system for postgraduate training and effectively improving the quality of academic degrees., Hu Jiao Wei Gao (2018) No. 76.

The development and challenge of Shanghai postgraduate dissertation sampling inspection project under the background of information digitization.

Over the years, Shanghai has continuously optimized the evaluation workflow and developed an independent software system which is applied to the evaluation process of Graduate Dissertation Quality assurance project. Based on the support and ability provided by information technology, postgraduate dissertation sampling inspection project has been constantly changing in the development of new generation information technology, making the evaluation business and evaluation technology interact for the first time, which has changed the traditional sampling operation mode.

Since the establishment of an independent website for Two-way anonymous dissertation sampling inspection in 2005, two-way anonymous evaluation system has been upgraded in phase II in 2009 which has realized evaluate classification and online communication evaluation. Phase II of the system has solved the problems of sampling probability, evaluate classification, limit of the server, expert database and professional database import through improving the sampling method, evaluation standard and evaluation method of the dissertation sampling inspection system in phase I, so as to combine the external mechanism with review of internal objection papers and disposal mechanism of the school which ensures the quality of Shanghai postgraduate dissertations.

In 2014, the provincial management department launched the postgraduate (the students are those who has been graduated for one year) dissertation sampling inspection which adopted the combination of key sampling inspection and random sampling inspection and increased the sampling probability for the units with high Two-way anonymous objection rate before replying. In 2018, with the standardization of the school's quality assurance awareness and process, the municipal level aims to control the results of the quality assurance system of graduate training units and no longer carry out the uniformly required sampling inspection of pre graduation papers. Each department, college and other secondary units of the University began to formulate their own quality review standards for dissertations, and gradually established their own blind review and sampling system to realize self-diagnosis, self-construction and self-optimization by purchasing service platforms (Wusiyun, www.cikn.et, etc.). In 2020, the Ministry of education further revised the new implementation plan, further strictly standardized the quality management of degree and graduate education, and adopted the method of classified evaluation to improve standardization, evaluation rules and verification methods of dissertations in different disciplines or interdisciplinary disciplines. At the same time, it is clearly pointed out that the results of the random inspection of papers after graduation are the key indicators to judge the qualification of degree programs and the quality of talent training in the future.¹² This change is also due to the continuous optimization and upgrading of information technology means, and the implementation mode has been changed from external monitoring to self-inspection by the school information management platform. This is the last step to establish the quality assurance of Graduate Dissertations based on the higher level of the national academic management institution, which is also a new challenge to the digitization of evaluation business information.

¹² Opinions of the Academic Degrees Committee of the State Council and the Ministry of education on further standardizing the quality management of academic degrees and graduate education. Academic degrees (2020) No. 19.

Implementation effectiveness of Information digitization in Shanghai postgraduate dissertation sampling inspection project.

On the basis of fully learning from the experience of Two-way anonymous evaluation websites, Shanghai established the "Shanghai Degree and Graduate Education Information Platform" (hereinafter referred to as the "Education Information Platform") in 2015 applied to expert communication review in postgraduate dissertation sampling inspection project. The information platform solves many problems such as the electronic transmission of graduate dissertation and the matching of tutors, and better realizes the combination of external supervision and the internal dissertation quality assurance system of the University.

Procedurally, the educational information platform adopts a certain matching method to integrate the whole process digitize information of the evaluation with the human operation of the evaluation project director effectively. Enter every expert, every paper, every evaluation rule and every sampling process method as data and input the data into the information system, The evaluation elements of the paper are transformed into the structural text description of the digital world, and then the needs of the paper evaluation are matched according to the design rules, so as to realize the platform sampling principle of random selection, key monitoring, science and justice.

In addition, the educational information platform can also summarize and analyze the data in the whole process of evaluation. Before random inspection, the thesis awarded the master's degree in the previous academic year is directly retrieved from the degree database, and the digital technology is comprehensively used to match the thesis with the research direction of experts, and finally the evaluation results and data are formed for storage. From the three dimensions of academic degree, professional degree and equivalent education, the sampling proportion of the number of papers submitted by the university to general sampling inspection and key sampling inspection is obtained; Make statistics on the review results of suspected academic misconduct papers and the voting results of "existing problems" master's thesis; Analyze the manual results of the first-class disciplines and professional degree categories of academic degrees, and finally form the annual work report of sampling inspection of master's thesis in Shanghai.

The platform sampling inspection realizes the information process of transforming the evaluation method into data, which lays a foundation for digitizing the whole process of dissertation sampling inspection in the future, and finally for the modeling and visualization of evaluation results.

The function and transformation of evaluation methods of the project driven by information digitization. Driven by the digitization of information, it brings a series of changes in evaluation methods and evaluation technologies. In order to meet the requirements of sampling inspection methods, evaluation elements and evaluation principles, and the evaluation experience expected by multiple operators such as evaluation experts, it is not only necessary to support information technology, but also to consider the value-added requirements for education and teaching quality from the top-level design level of information platform, This is not only a simple digital transformation of the evaluation business process and its evaluation function positioning, but also a transformation and even subversion of the way of thinking¹³. Therefore, the application and reform

¹³ <https://www.linkedin.com/pulse/What-is-the-essence-of-informatization,-digitization-and-digital-transformation-kevin-tang-phd>.

of the project need to constantly adapt to the national postgraduate training guidelines, policies and development trends, and match the educational practice, teaching and research training scheme and educational concept of the training unit. It is more necessary to provide continuous and effective data evidence and comparable efficiency indicators for the development of postgraduate training quality of school.

1. The transformation of evaluation function orientation of the project

The self-inspection of dissertation before graduation organize and by school and the sampling inspection of dissertation after graduation by external quality institutions entrusted by the provincial education administrative department, In terms of function orientation, the function of the project has been transformed from single function of monitoring and evaluation to value-added evaluation; In terms of policy, it shows the transformation of the state to the graduate training from leading to guiding ;In terms of government functions, it reflects the transformation of content governance results of university to provide ideas and directions ;In the role orientation of service subject, it has realized the transformation from heteronomy to self-discipline. In addition, based on the theory of supervision mechanism, as one of the "heteronomy" methods, the random sampling function realized by its platform ensures the unity and comparability of data collection and the fairness, efficiency and relative science of evaluation procedures. As a third-party evaluation institution, through the comprehensive comparison and analysis of large-scale data over the years, we can understand the quality of postgraduate training in Shanghai from the quality of postgraduate dissertation. This transformation is the requirement of the times that we should constantly strengthen the methods and technologies of educational evaluation, comply with the national educational policies, let the education methods improve teaching, let the government understand, and provide the basis for decision-making.¹⁴

2. Selection and innovation of evaluation process and method

Although the standards of the two projects and the use and processing of the two evaluation results have their own emphases, we can learn from the multi-level project response theoretical model in value-added evaluation to establish relevant statistical analysis. Through direct and indirect correlation analysis, we can further reflect that in the process of the two projects, different tutors, different academic organizations (degree program), the output status of students' learning efficiency in different schools, as well as the situation or deletion of learning support conditions and quality assurance. Therefore, the information platform will bring a lot of convenience and innovation to the two projects. In terms of evaluation methods and processes, the information platform provides convenience in determining the sampling scope, formulating evaluation standards, agreeing on the submission method, selecting the evaluation method and determining the grade of evaluation results with the client; In the operation process, randomization based on Two-way anonymous evaluation principle and object-based key monitoring have been achieved; Standardization of evaluation indicators has also been realized , the characteristics of postgraduate training objectives, the humanization and simplicity of serving different subjects have been highlighted and we also retained the autonomy of graduate training unit.

¹⁴ Feng Hui, Liu Pingping, Chen Taohong. Research on educational evaluation procedures. Higher Education Press. October 2010. Page I .

3. Expand the utilization value of the project and information digitization platform

Establish a "Trinity" dissertation platform system which integrating Two-way anonymous evaluation before replying, postgraduate dissertation sampling inspection after graduation and excellent evaluation on dissertation. Through the timely feedback and disclosure of evaluation data, better integrate data in the whole city, in order to meet the needs of different levels, so as to maximize the utilization value of the existing information digitization platform.

Firstly, taking the Two-way anonymous sampling inspection as a means of diagnosis and early warning of the quality of papers before graduation ,in order to realize the docking function of Two-way anonymous sampling inspection in the educational information platform; meanwhile, in the postgraduate dissertation sampling inspection after graduation, establish indicators with comparative, differential and characteristic, such as excellence rate, qualification rate and objection rate of dissertation in different research directions, in order to strengthen authorizable organization and academic discipline, guarantee scientific research condition and academic atmosphere. We should promote the final implementation of these elements; Finally, promote the development of excellent postgraduate dissertation at the level of colleges and municipal, ensure the sinking of key point of academic management of the project, better motivate excellent papers and excellent tutors, and improve the quality of postgraduate training. The more perfect and scientific the evaluation mechanism is, the more conducive it is to improve the service quality of the education information platform, and make full use of guiding, incentive and supervision role of the evaluation mechanism and its functions.¹⁵

It can be seen that this project is a case that external quality institutions can be a helper and supervisor intervene in the micro field to evaluate the learning achievements of postgraduates under the information digitization technology,¹⁶ Through the information learners, based on visible evidence and centered on education process, achievement and performance. This evaluation method reflects that the postgraduate dissertation evaluation project in Shanghai is a project which is focuses on the comprehensive level of the ability which is based on discipline cognition and innovative problem-solving. The government, research institutions, universities and other evaluation subjects have benefited from the development of information digitization platform and played a positive role in the evaluation function, which has laid a foundation and led the transformation of the current higher education evaluation model and the concept of education quality.

¹⁵ Yong Wenjuan. Digital information service strategy of Comprehensive Archives in Colleges and universities [J]. Office automation, 2021,26 (13): 53-55.

¹⁶ Meng Jie. Analysis on optimizing the random sampling system of Graduate Dissertations in Shanghai [J]. Research on education evaluation, 2013 (4): 59.

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Application of Information Technology in Teaching and Learning Improvement at the Lahore School of Economics

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Abstract

This paper shows the impact that Application of Information Technology has on Learning Improvement using the example of Lahore School of Economics application of the Learning Management System (LMS). The paper emphasizes on the role of Quality Assurance Department in creating a more transparent system to improve quality of education. This also shows that incorporating more Information Technology practices leads to the creation of an environment where learning is given more importance and quality of education increases. This also shows the importance of the faculty having adequate IT related knowledge as the shift to Online Education has proved the usefulness of having the right technological knowledge. Information Technology application proves to be beneficial in the education sector as it creates a more conducive learning environment, increases participation, more access to information and makes the dissemination of information easy.

Keywords: Information Technology, Teaching Methods, Online Teaching Methods, Learning Management System (LMS), Quality Assurance, COVID-19.

1. Introduction

This paper focusses on the Implementation of Information Technology in order to make Online Education better at the Lahore School of Economics (LSE). Currently ranked in the top five business schools of Pakistan, LSE has always made top quality education a priority. The main objective of this paper is to imply the impact that Information Technology has on improving learning in the education sector post the COVID-19 pandemic.

In the Year 2020, the pandemic caused a complete closure of all educational institutes, leading to a complete turmoil and caused a shift towards the Online Education system. In these times turning towards the usage of Information Technology seemed to be the most viable solution, which helped revive the education sector back despite many problems. Information Technology has made its way into every aspect of our lives, this has led to a more open knowledge sharing platform and has transformed learning and teaching methods (Sarkar, 2012). With more advancements in Information Technology there has been a revolution in the classroom learning and has also evolved teaching methods, with more access to information and the creation of online libraries knowledge sharing has been made easier (Farid et al. 2015). In today's time Information Technology is a vital key that helps in promoting knowledge creation and dissemination (Altamony et al.2012).

The use of technology in educational institutes creates more opportunities for students to study and work together, leading to more open exchange of ideas, vast experiences and also is a vital source in improving problem solving skills (Shatri, 2020). Use of Information Technology proves to be beneficial in the development of a variety of skills such as better communication skills, improved critical thinking, better research skills and teamwork (Reinhold et al. 2020).

Implementation of Information Technology has also brought forth the Learning Management Systems that not only provide students with up-to-date academic information but are also very useful in aligning many other educational activities such as course allocations, enrollment data, sharing of timetable, fee management, classroom allocation and many more (Tolley et al. 2009). To make every academic year a success the above-mentioned educational activities play a crucial role for the smooth operation of any educational institute, this not only proves to be beneficial for the students but also help in creating a more coordinated environment and creates fruitful interactions between the students, faculty and the administrative staff (Agbatogun,2013).

Higher Education Institutes all over Pakistan and other parts of the world are moving towards more Information Technology usage in the education sector. More technology-based initiatives are proving to increase the quality of education, making it more effective and providing access to quality education to all (Amasoma et al. 2010). Many believe that technology is the solution to all problems in the education sector and the Pandemic has proved that implementation of technology in the education sector is a need in this era of globalization. Technology is well adapted by students and in turn helps them to prepare for future challenges and to be well equipped with the adequate knowledge (Grimus, 2000).

2. Literature Review

Information Technology is an important phenomenon in this era and is an active part of our everyday life. With the use of technology, tasks have become more efficient, effective and relatively take very less time to perform. In the education sector, technology has proved to be a blessing as it has eased the process of communication and made the dissemination of information more effective which has made learning more approachable and easy. This has brought up more innovative ways of learning new concepts in a way that were never thought of before.

The use of hybrid learning to improve online teaching and learning is beneficial. The utilization of information systems and programming in the development of online learning systems is driving the expansion in online teaching methods. Students may be more engaged in attending lectures online if they use learning media such as video, audio, and intriguing course material, this will also improve learning patterns. This hybrid learning strategy can be carried out continually according to the online teaching schedule. Teachers and students can benefit from feedback in online teaching setting while using the hybrid learning strategy in turn this will help in developing a more innovative approach in designing new teaching methods and to improve communication. The typical student who uses an e-learning program has a positive impact and can bring about changes needed to improve the online teaching system (Sutiah & Supriyono, 2020).

Previous study has found evidence that technology may produce favorable outcome in teaching and learning. According to Ma and Runyon (2004), effective implementation of information technology can raise academic output and improve quality in higher education institutions. The usage of technology has also considerably improved educational quality (Inoue and Bell, 2006). Furthermore, the implementation of IT network systems significantly increased academic opportunities and enhanced teaching outcomes (Selwyn and Brown, 2000). Because of the widespread availability of computers, multimedia-assisted teaching has become an appropriate method and medium of instruction and teaching in current times (Li and He, 2010). Although the benefits of technologies in

education were evident, there were a number of barriers that prevented teachers from incorporating it into their curriculum. The disparity in digital views and experiences between faculty and students, in particular, seemed to be pertinent to the issue.

There are two opposing viewpoints on the distinctions between instructors and learners. On the one hand, Prensky's (2001) concepts of "Digital Natives" and "Digital Immigrants" seemed to imply a rather permanent digital gap between teachers and pupils. Young people that spend the majority of their time using technologically linked hardware such as computers, videogames, and cell phones are known as "Digital Natives" (Prensky, 2001). They might easily adopt technology in learning since they are so comfortable with it (Bennett et al, 2008). Teachers, on the other hand, are categorized as 'Digital immigrants,' meaning they were not born into the realm of technology but learned new features of it as they went along (Prensky,2001). As a result, it was believed that teachers would be slower to adopt technology as a teaching aid.

In order to operate effectively and productively in the expanding global Higher Education industry, all universities must reassess their mission and respond to shifting industry needs and make a shift change to online/hybrid learning. The homogenous requirements of academic institutions (in comparison to several other industries), merged with a strong motivation to react quickly to a raft of widely accepted influences throughout the Higher Education industry globally, point to the possibility of sharing similar processes and resources via shared services (Miskon et al., 2011). Growth in student enrollment, changes in the composition of academic work, growing competition between academic institutions and other higher education providers, government continuously pressurizing to excel in operational efficiency, and generally varied and changing stakeholder expectations are three environmental drivers that impact desire to participate in shared services from academic institutions (Deloitte Touché Tohmatsu et al., 2001). These significant and ongoing transformations in the industry necessitate more efficient and enhanced operations.

As a result, universities are looking for ways to discover services that may be handled at a reduced cost and find the most efficient and effective way to supply such services. Academic Institutions are considering cooperating or collaborating in a wide range of fields in order to save money and increase performance. Furthermore, academic institutions are increasingly eager and willing to share knowledge, solutions, and expertise with one another (Boyle and Brown, 2010). Universities are major users of information technology; "development, convergence, and incorporation of IT in institutions have caused massive shift in the digital technology professors, students, schools, and universities have and may be required to obtain," and this trend will continue (Jackson, 2012). Higher Education Institution Administrators "continue to strategize for improvements in information technology to guarantee that the institutes' information needs are safely met" despite budget cuts (Zastrocky, 2012). Information technology plays a critical role in enabling and driving shared services.

3. Online Teaching at the Lahore School of Economics

Lahore School of Economics is ranked amongst the top business schools of Pakistan. Established in 1993, the institution received a charter in 1997 by the Punjab Government. The Lahore School has currently employed 102 full time faculty and 56 visiting faculty and 3100 graduate and undergraduate students. The Lahore School has made quality education a priority and each policy is made keeping

in mind the best interests of the faculty, administration and students. The Lahore School has divided their academic programs in six main divisions: Business Administration and Finance, Economics, Social Sciences, Mathematics and Statistics, Media Studies and Environmental Studies.

In the March of 2020, Lahore School made a swift change towards Online Education, making sure that all students and faculty are aligned in every way possible. Rules, Policy and standards setup by the Higher Education Commission were implemented and made sure that the Online Teaching methods were implemented smoothly. Faculty and students were given extensive training to make them familiar with Zoom Software and the Lahore School Learning Management System (LMS) (See Appendix 1).

The Lahore School Learning Management System (LMS) was a portal developed to create fruitful interactions between the instructors and students. The LMS system connects the students with all the required academic material. The LMS consists of all the required materials such as online video lectures, online course content, quiz and assignment submissions, grading system, attendance data and fee management.

Initially the Online system was developed in such a way where students were divided in two groups among each section, where each group consisted of 25-26 students, classes were divided among discussion and lecture sessions. The lecture session consisted of a larger group, whereas, the discussion session group was smaller and consisted of 25-26 students each. This division was made in order to facilitate more learning and to make sure students got individual attention in the discussion sessions and any confusions could be cleared out.

With the post pandemic era and the COVID-19 situation getting better, Lahore School shifted towards a hybrid system where each section was divided into groups and Group 1 had to attend classes in person in the first week and Group 2 took classes online for the same week and the same pattern was followed in the subsequent weeks to make sure each student interacts with the instructor in person and online. This method proved to be very beneficial in promoting learning and also helped in limiting the spread of COVID-19 among the on-campus students.

4. Impact of Applying Information Technology at the Lahore School of Economics

The Quality Assurance Department at the Lahore School of Economics has played a pivotal role in the implementation of Information Technology Practices at the Lahore School of Economics. The Quality Assurance Department made sure that the quality of education is maintained in every way possible. Faculty Development Workshops and Mentoring Programs are arranged in order to equip the faculty with the latest technological knowledge and to clear out any ambiguities regarding any problems they might be facing. Fifteen Faculty Development Workshops are arranged every year, to provide instructors with a platform to interact with each other, to come up with innovative learning practices that involve the usage of IT systems and to improve their teaching styles and methods. This proves beneficial and plays a pivotal role in creating more innovative teaching practices. Peer Evaluations are carried out each semester, this proves to be helpful in a way that as Senior most faculty members assess the teaching methodology of the junior faculty and make sure that any problems are sorted out and quality of education is maintained.

The Online LMS system is the perfect example of application of Information Technology to maintain quality of Online Education. The benefit that LMS provides to the Quality Assurance Department is that systems have become more transparent and each and every individual is now more responsible for their actions and this in turn creates an environment where everyone works to make their teaching methodology better and to bring in more innovations to cater to the Online students' demand. The LMS has also proved to be very beneficial for the instructors as they can manage students easily, update course content in real time and cater to students need and solve any problems. Also, the application of Information Technology has proved to be very beneficial for students in a way as they have more time to spend on studying available course material, they have more access to information which helps in learning new concepts and also this proves to be beneficial in learning new skills such as analytical skills, more emphasis on teamwork and also equips them with the required skills needed for the job market in future.

The availability of Online Libraries also proves to be very beneficial as both the faculty and students have constant access to a huge variety of books, which in turn helps more information to be acquired and disseminated to the students and increase innovation and learning capabilities.

5. Conclusion

Teachers and students can now work together in the teaching-learning process owing to the developments in information technology. It helps to broaden their horizons, increases their knowledge, improves learning and allows them to participate in a variety of academic activities in the educational sector. The use of a wide range of technologies, both software and hardware, enhances the teaching and learning process. The use of modern technology has a huge potential for improving educational practices and systems. Customization of teaching methods, use of multi-sensory and multi-media technology resources, and efficient and productive management of various academic institutions are only a few of the requirements of today's age in the field of teaching and learning. Information technology aids the teaching - learning process in a more efficient manner. Now, the teacher acts as a facilitator to the students, guiding them through their studies.

In traditional classrooms, the teacher's responsibility was to be the center of instruction. The teacher now selects the material, experiences, and educational activities, navigates the resources, and instructs students on how to access and use information technology to achieve the desired academic results. Today information technology will not determine the future of education; rather, how we design the place of technology will dictate the outcome and future of education. It was discovered that instructors still require assistance in order to properly employ technology for the benefit of their students. Institutions should be the ones to supply this assistance. Today, the internet is a valuable resource for millions of students, instructors, and administrations seeking global information. As a result, applying technology in lectures and administrative areas significantly increases modern education opportunities and allows people to access online database resources with ease to improve learning and aid in the dissemination of information.

Appendix A: Learning Management System (LMS)



Figure A: Lahore School of Economics Learning Management System



Figure A: Lahore School of Economics Learning Management System Courses and Teaching Material

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Current State of Internal Quality Assurance in Mongolian Accredited Higher Education Institutions

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Abstract:

Globally, the internal quality assurance (IQA) of higher education has become an important agenda for enhancing the quality of education. It has been 8 years since the IQA system was introduced and established in Mongolian HEIs. The main body overseeing QA in Mongolia, the Mongolian National Council for Education Accreditation (MNCEA) revised its accreditation criteria to align with international standards in 2016. This paper evaluates the progress and development of the IQA in Mongolia after MNCEA has added an IQA criterion to its standards, to identify which cycle of IQA is Mongolian HE Sector in. The level of IQA development is expected to be very high in Mongolian HEIs. Because most Mongolian HEIs are required to satisfy an IQA criterion as a part of their national accreditations, policy makers might expect that the level of IQA in Mongolian HEIs is quite high. However, many institutions do not meet this expectation in practice.

However, HEIs do not meet this high expectation on the ground. A recent study revealed that there is a gap between the accreditation results and the current reality. Therefore, this paper will address the common problems and challenges of IQA faced by HEIs and develop policy recommendations for improving IQA at the institutional level. This paper also raises awareness of the reality of IQA as currently practiced in Mongolian HEIs, so that it may help HEIs proactively develop better strategies and approaches to address current and emerging challenges.

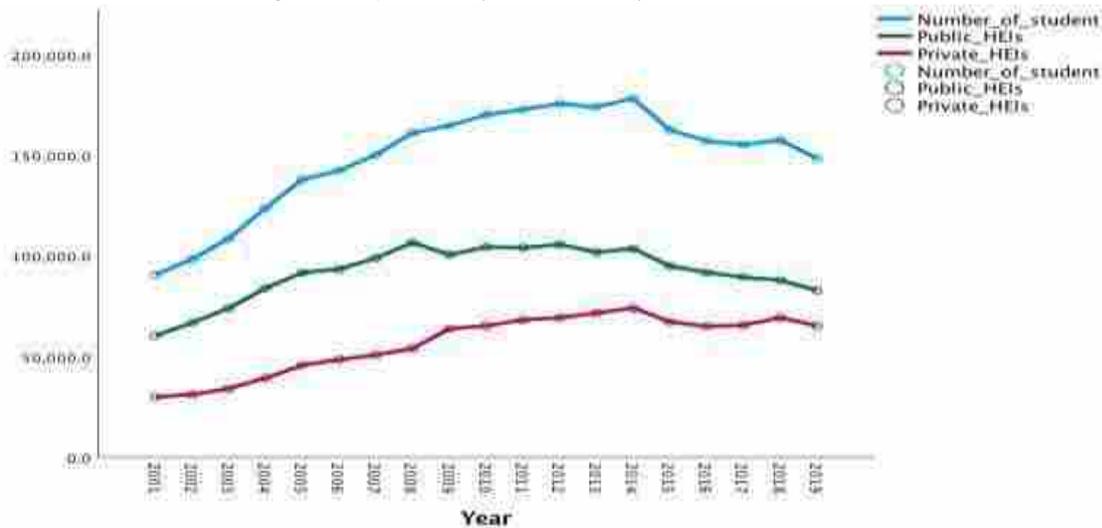
Keywords:

Higher education; quality assurance; internal quality assurance

1. Introduction:

Quality assurance ensures that input, process, and outcomes of an HEI comply with threshold standards and stakeholders' expectations. It includes external and internal review, assessment, monitoring and control (Aerden, 2013). The internal quality assurance of higher education has become an important agenda for enhancing the quality of education (Martin, 2018). Increasingly, HEIs realize the need to emphasize and strengthen academic quality and organizational excellence in mass and universal higher education (Trow, 2006). According to the UNESCO Institute for Statistics (UIS), the global demand for higher education could reach 332 million in 2030. An increase of 176% from the 2015 figure of 120 million. Like many other countries, over the past two decades, the Mongolian higher education sector has gone through tremendous transformation. According to the educational statistics of the Ministry of Education and Science (2019), from 2001 to 2019, the number of students increased from 90.664 to 148.466 representing a growth in the gross enrollment ratio (GER) to 66%. The total number of higher education institutions also drastically expanded. By 2002, the number of HEIs skyrocketed to 185 from 55. Today there are 95 HEIs that consist of 21 public, 71 private, and 3 branches of foreign HEIs.

Figure 1: Dynamics of the number of students enrolled in HEIs



This accelerated growth of HE was not supported by public opinion. The unemployment rate among tertiary graduates reached 40% (Employability research report 2018 of the Ministry of the Labor and Social Protection). The debate on and criticism of the quality of HEIs, versus the increasing number of HEIs, remains very lively. Employers criticize HEIs for not providing the industry relevant skills to its students. Also, the content of the academic programs does not reflect and meet the society's needs. A systematic curriculum review and revision process is missing. In response, the Mongolian higher education sector is undergoing a reform, implemented by a project called HERP (Higher Education Reform Project) funded by ADB since 2012. The project focused on quality assurance of HEIs, academic staff development, research capacity, governance, and financing of higher education. Quality assurance and accreditation has been one of the key areas of reform of higher education.

Within this context, internal quality assurance has become a critical means to improve the quality of HEI practices and outcomes. The internal quality assurance system should be developed to ensure the strategies are achieved. Thus, the definition of quality that the Mongolian HEIs adopted is “fitness for purpose,” which entails a mission-based approach to internal quality assurance in general, and accreditation in particular. In the case of a mission-based accreditation, ideally, an HEI sets a clear mission, and drawing on the mission statement defines its strategies for development and implementation of the mission. Along with a comprehensive and well-designed strategic plan, it also devises a quality assurance system that ensures smooth and effective implementation of the set strategies. (Karakhanyan, 2014)

Mongolian National Council for Education Accreditation (MNCEA), the main body of quality assurance in Mongolia, was established 22 years ago under the Ministry of Education. This central agency has engaged in the quality assurance and accreditation of HEIs through periodic external reviews since 1998. The history of accreditation in Mongolia can be divided into three stages (Evaluator's manual of MNCEA, 2019). The first stage was a self-evaluation of quality assurance which covered the year of 1999-2005. During this stage, the credit system was introduced in Mongolia. Second stage was quality reform which covered the year of 2005-2012. That period highlighted outcome-based measurement of learning. Third stage was focused on internal quality assurance: IQA in Mongolian higher education began to emerge in 2012 and the first initiative

entailed the provision of guidelines for IQA in Mongolian HEIs, by global QA expert, Dr. Susanna Karakhanyan, and national expert, Dr. Bat-Erdene Regsuren., supported by HERP.

Under the HERP project, MNCEA revised the criteria and procedures for institutional and academic program accreditation in 2016. To revise the criteria and procedures by aligning them to the major international standards, MNCEA implemented a two-year Twinning Project partnering with a German nonprofit Quality Assurance Agency called ASIIN. As a result of the project, MNCEA revised the national QA and accreditation system and developed new standards and procedures for institutional, program and initial accreditation, which were 85% aligned with the ESG (European Standards and Guidelines). Development of new criteria and procedures aligned with international best practices is considered the most important milestone of QA. The major revision of the accreditation criteria was the IQA part. For the first time, MNCEA added IQA to its institutional, program, and initial accreditation criteria.

According to MNCEA report, in 2019, 77 institutions and 130 academic programs have been accredited so far. 43 of those 77 HEIs and 93 of the 130 academic programs were accredited by the new criteria which include IQA. Around 84,6% of accredited programs and institutions fully met the IQA criterion, 15,6% of them partially met, which means no HEI or program failed to meet the IQA criterion. This result implies that performance of IQA in Mongolian HEIs is quite high, even though the IQA criterion has been introduced only recently. However, this performance is not consistent with the results of the international accreditation of Mongolian HEIs. When the nationally accredited programs which met the IQA criterion fully went through the international accreditation, they usually only partially met the IQA criterion even through international and national accreditation criterion is ostensibly the same. Moreover, studies by Orkhon (2018) and Chantsaldulam (2019) found that the IQA level of Mongolia is inadequate based on their research. Thus, there is a need to evaluate the current state of IQA in Mongolian HEIs and find out the issues and solutions.

In Mongolia, most HEIs have established IQA units but they seem to remain a small administrative unit, rather isolated from the faculty. In contrast, the international best practices entail that a quality culture be spread through the IQA system, rather than concentrated in a single IQA unit. International HEIs establish Quality Assurance Committees at the institutional level, sub committees at the departmental level, and establish an IQA unit as a hub. All departments appoint faculty members responsible for IQA who report to the IQA unit regularly. This demonstrates that IQA is spread throughout the institution and that the IQA system works effectively and does all its functions properly. However, this kind of IQA system is not yet in place in Mongolia.

According to the Japan University Accreditation Association (JUAA, 2019), IQA development can be divided into 2 parts: establishment of IQA and effectiveness of IQA. Normally, it takes 4-5 years to reach the next part of transition. It has been 8 years that MNCEA officially introduced and developed IQA in the Mongolian HE sectors, which means, IQA in Mongolian should have reached the stage of effectiveness of the IQA. But the reality is that the system is not yet at that stage.

2. Aim and objectives:

Therefore, this study aims to evaluate the progress and development of the IQA in Mongolia after MNCEA added IQA criteria to its standards, identifying which cycle of IQA the Mongolian HE

Sector is in. Moreover, it will address the common challenges of IQA faced by HEIs and make policy recommendations to improve IQA in Mongolian HE.

3. Method:

I used a quantitative survey. The primary data was a questionnaire with 10 questions involving 70 participants from 29 HEIs as shown in Table 1. The number of institutions accounted for 70% of the total number of 43 accredited HEIs in Mongolia. The random sample of 29 universities and colleges represent public and private sectors. The survey questions are attached to this study. The survey was administered online, using Google Forms.

I also conducted in-depth, semi-structured qualitative interviews with 12 participants from 7 HEIs. The interviews focused on 10 specific questions as shown in Table 2. Topics included participants` own interpretation of the IQA, common problems they encountered, and their feedback on the implementation of IQA. Participants were evaluators and coordinators of MNCEA, IQA specialists working in HEIs, and program directors and faculty members who led their teams to write self-assessment reports for accreditation (SARs).

Additionally, I conducted document analysis on how HEIs met the IQA criteria in accreditation evaluation reports. The document analysis covers review of the following documents related to IQA: (1) development policy of the University 2014-2024; (2) Strategic planning of universities 2014-2024; (3) Student procedures; (4) Online course procedure; (5) Finance procedures; (6) Internal rules and regulations; (7) Academic regulations; (8) Assessment policy; (9) The Quality Enhancement Framework Policy; (10) Benchmarking for QA Procedure; (11) Faculty and Staff Handbook; (12) Procedures on evaluation of QA; (13) Guidelines for study program curriculum; (14) Guidelines and requirements for course curriculum development; (15) Requirements for textbooks and manuals; (16) Guidelines for developing and preparing an online class; and (17) Requirements for online classes.

Based on a multi-stakeholder approach, the questionnaire was administered both to external assessment teams and to self-assessment teams. Likewise, in-depth interviewees included participants in multiple roles to highlight stakeholders` similarities and differences across various roles. A Total 82 respondents, including 69 from 29 HEIs and 13 from MNCEA, have participated in the questionnaire. Interviews were conducted with a total of 12 participants.

Table 1. Informants

Questionnaire				
1	IQA specialist	HEIs	25	Public HEIs - 10 Private HEIs - 15
2	Academic staff	HEIs	10	Program director - 3 Faculty member - 3 Lecturer - 4
3	Evaluator of accreditation	MNCEA	25	A level reviewer - 7 B level reviewer - 7 C level reviewer - 6
4	Accreditation coordinator	MNCEA	10	Advisor level - 2 Senior specialist - 4 Specialist - 4
Total - 70 participants from 29 HEIs and MNCEA				

Table 2. Informants and system of coding.

Qualitative - In depth interview					System of coding
1	IQA specialist	HEIs	3	Public HEIs - 1 Private HEIs - 2	IS1 IS2 IS3
2	Academic staff	HEIs	3	Program director - 1 Faculty member - 1 Lecturer - 1	AS1 AS2 AS3
3	Evaluator of accreditation	MNCEA	3	A level reviewer - 1 B level reviewer - 1 C level reviewer - 1	EA1 EA2 EA3
4	Accreditation coordinator	MNCEA	3	Advisor level - 1 Senior specialist - 1 Specialist - 1	AC1 AC2 AC3
Total - 12 participants of 7 HEIs and MNCEA					

4. Findings:

1. Findings of questionnaires

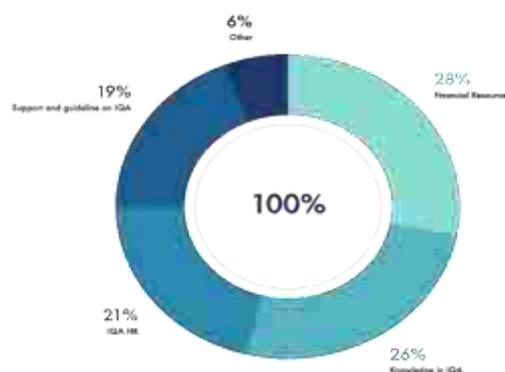
To the question of “which criterion is the most difficult to fulfill and collect the evidence for in developing the SER?”, 79% of the participants indicated the criterion on IQA. 16% of participants indicated the criterion on resources, and 5% of them the criterion on mission and strategy.

To the question on the existing IQA function, 78% of the HEIs participating in the study have set their IQA policies, structures, manuals and other related documents. 85% of them have assigned IQA specialists and units. Survey results revealed that most HEIs have already established an IQA structure and policy, and provide human resources to support them.

To the question asking respondents to identify pressing challenges, results highlighted (1) the financial resources to maintain IQA, (2) the lack of IQA knowledge and (3) skills and the shortage of human resources as shown in Figure 1.

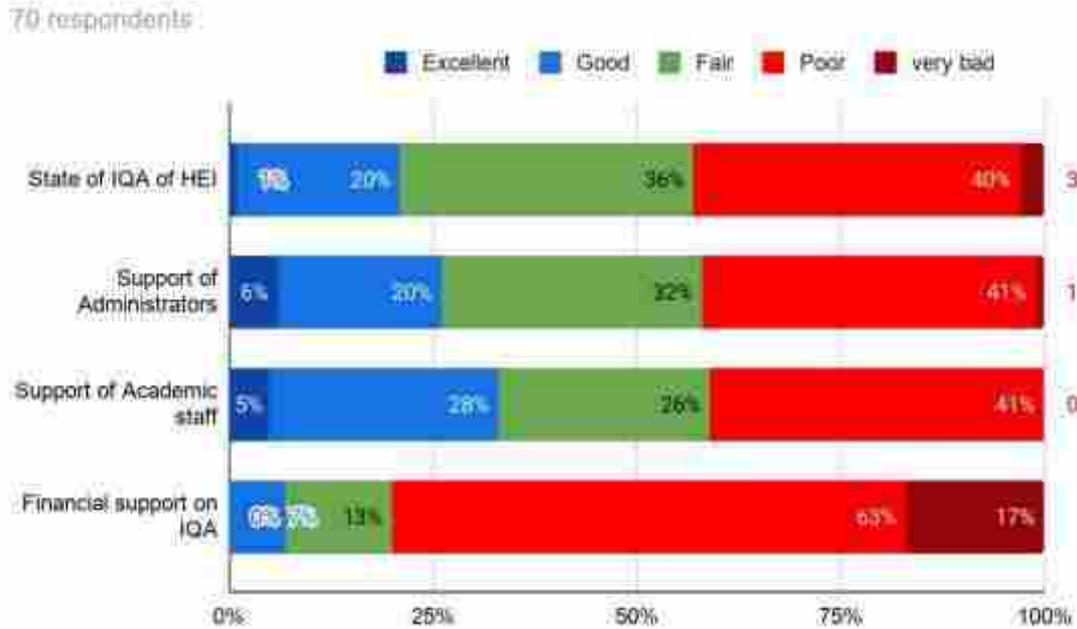
Figure 1

The most challenging problems regarding IQA facing HEIs



4. To the question on adequate support for IQA, interestingly, large proportions of participants (ranging from 41 to 80 percent) responded that they lack support in each of the categories included, as specified in Figure 2.

Figure 2



5. To the question on belief in IQA, 14% of the participants were not sure whether IQA enhances the overall quality of HE.

Do you believe that IQA system/unit of your HEI improve the quality of HEI?

all respondents

May be
14.3%

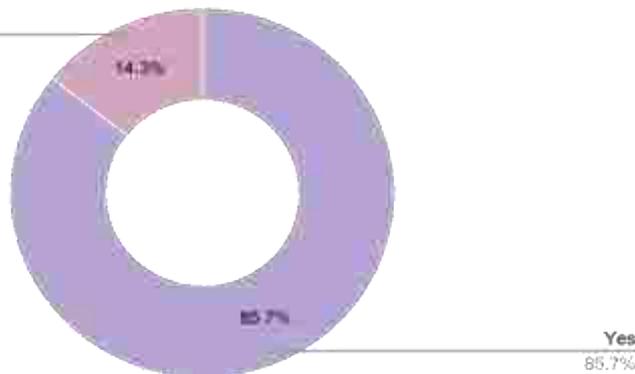


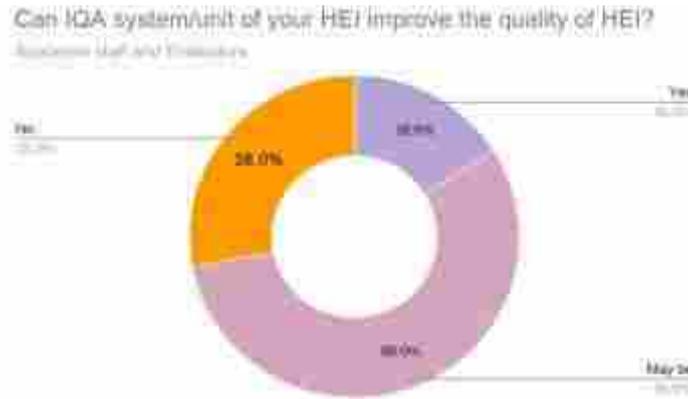
Figure 3

Generally, 85% of the participants believe that the IQA system/unit will improve and enhance the quality of HEIs.

6. Results on this question show telling differences in perceptions, when broken out by respondents' roles. Only 16% of the academic staff and evaluators (mainly professors) agreed that IQA can improve their institution, while 28% reported that they disagreed (see Figure 4). A majority (56%) of the respondents in this group responded "not sure" to this question. In contrast, 80% of the IQA

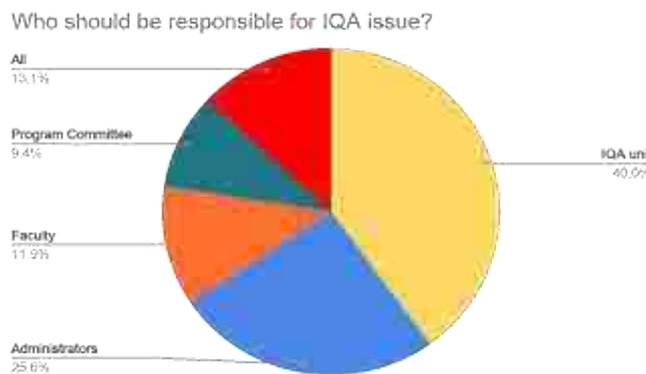
specialists and accreditation coordinators agreed that the IQA system/unit/specialists can improve the quality of HEIs.

Figure 4



7. To the question on who holds the responsibility for IQA, as shown in Figure 5, 13% of the participants responded that IQA is the responsibility of all members, units and levels of the university. 40% of them indicated the IQA unit, and 26% identified HEI administrators as the body responsible for IQA.

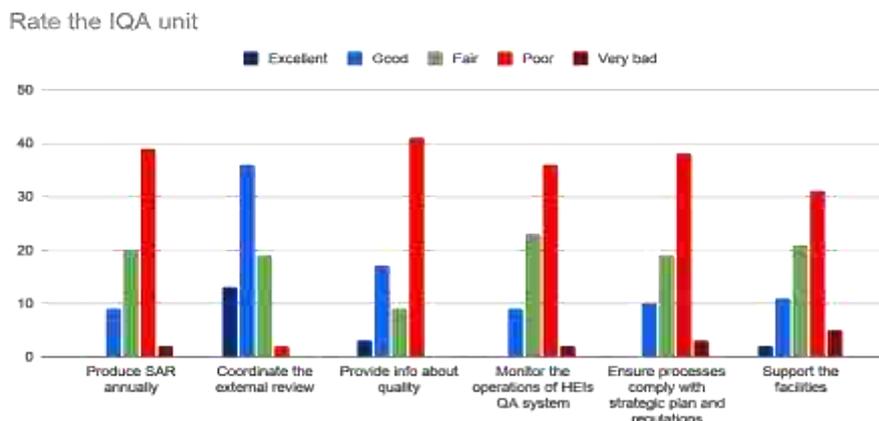
Figure 5



8. To the question on identification of the development stage of IQA, 88% of the respondents stated that HEIs in Mongolia are still at the level of “Establishment of IQA”. It will take another 2-4 years to move to the next level “Effectiveness of IQA”.

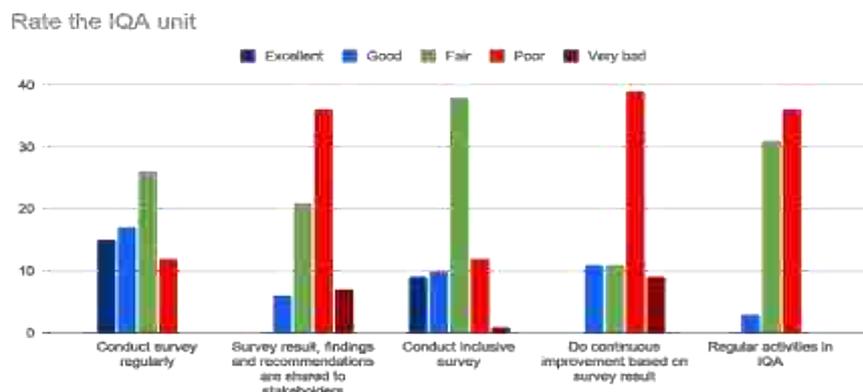
9. To the question rating the functions of the IQA unit, respondents predominately marked “poor” in most tasks, except “coordinating the external review and conducting surveys.” For example, ratings of poor or very poor were selected by over 40% of respondents regarding the IQA unit’s performance in producing the SAR and providing information about quality. This suggests that IQA units are not meeting the expectations of stakeholders within their respective HEIs.

Figure 6



10. Similarly, in ratings on the performance of the IQA unit, the modal response was “poor” in most tasks, except conducting inclusive surveys and conducting surveys regularly.

Figure 7



2. Findings of interviews

1. In response to the question “Why is the IQA criterion the most difficult to fulfill?”

Most of the academics interviewed identified one particular challenge. It is related to the low level of IQA implementation:

As the IQA level of HEI is so low, there are very few things to write in the SAR. Especially for program accreditation, there is no specific IQA evidence or facts for the academic program [to include], so we wrote very generic text like “institutional level IQA issue.” (IS2)

If there is no IQA specialist or IQA unit in HEIs, it is very challenging and [we have] nothing to write down on the IQA part of the SAR. (AS3)

I usually asked the SAR team of HEIs to show IQA as part of SAR of other schools. (AC3)

2. Feedback from participants on the question “What should administrations of HEIs do to support IQA?” include:

Top level managers and administrators should make proper legal frameworks and IQA policy; build capacity building of IQA specialists; provide working environment that IQA specialist can work independently; Provide enough resources and budget for IQA unit; and develop Quality Assurance Framework to ensure the alignment of planning, resources behind the achievement of university goals.

I think IQA is the most neglected issue in HEIs. Administrators do not realize the importance of IQA so they set a very small amount of budget for the IQA unit. So no money, no development (IS2)

3. How do you rate the participation of academic staff in IQA?

Very bad. Unless academic staff understand that the quality is all stakeholders` issue, we`ll never be able to expect them to collaborate with IQA specialists. (IS1)

4. Why do you think that level of IQA is very low? In order to improve policy what should we do?

Most interviewees of the low level of IQA to a fundamental policy issue. Participants suggested that it should be compulsory for every HEI to have an IQA unit.. Under current policies, only MNCEA requires this, through its accreditation criterion.

5. Do you agree that MNCEA`s assessment is lenient, especially criterion IQA?

A majority of interview participants agreed.

The average IQA level of Mongolian HEIs very low, so evaluators usually do not assess the criterion on IQA seriously. (EA1)

There are cases in which nationally accredited programs subsequently went through international QAA and received a rating of “partially met,” even though the criteria were ostensibly the same.

I would say MNCEA`s accreditation assessment is lenient and easy to pass. 2 years ago, our academic program was nationally accredited successfully. Just after we received the national accreditation, we went through international accreditation. Unfortunately, we received the mark ‘partially met’ and a 1-year accreditation. I must mention that the accreditation criteria of MNCEA and the international QAA were the same. (AS2)

MNCEA`s evaluation reports of HEIs should be transparent and published on its website. Then we could prevent the lenient approach. (EA2)

6. To respond to the what IQA specialists should do, many of participants suggested that they should explain the significance of IQA to all stakeholders and work closely with academic staff

‘IQA specialists should share survey results, findings and recommendations with all stakeholders (AC1)’.

7. In terms of MNCEA`s performance on IQA, most interviewees rated it as weak.

As the main organization of quality assurance, MNCEA should provide standard training and workshops on IQA regularly. As an evaluator of MNCEA for 4 years, MNCEA has not provided me any training on IQA. (EA1)

Now, it is all about big data and digital platforms. MNCEA should create the platform that can help the exchange of ideas and best practices of IQA. (EA3)

There are no specialists who specialize in IQA in MNCEA. (AC3)

As an accreditation coordinator, I do feel that MNCEA should make an IQA sample/template procedure. (AC2)

8. During in-depth interviews, professors and lecturers stated that IQA units and specialists cannot improve the quality of HEIs unless they work more effectively. An IQA unit consisting of 2-3 people cannot make any change at all, they said. On a positive note, some participants highlighted that their institution`s IQA unit started to conduct surveys and assessments regularly and tried to build a quality culture. However, the results of the survey were never shared with stakeholders. Results and findings obtained through surveys and self-reflection did not become input for a further review of Strategy and Policy. Indeed, their steps completed only half of a standard Plan-Do-Check-Act (PDCA) quality cycle.

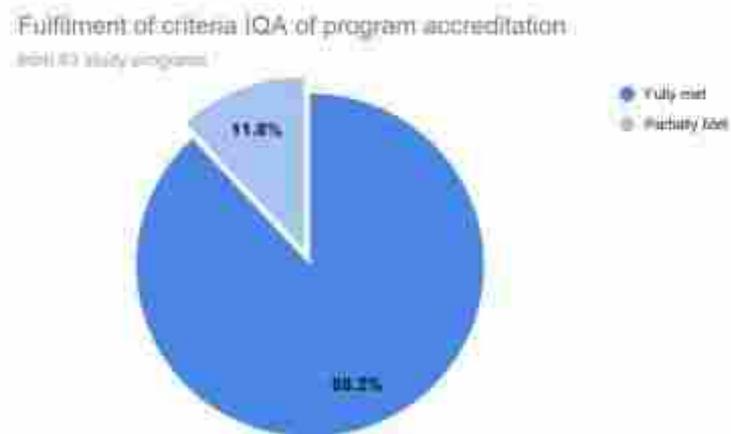
3. Findings of document analysis

In order to create statistics on programs and institutions' fulfillment of the IQA criterion for accreditation, I conducted document analysis of evaluation reports of program and institutional accreditation of the last 2 years. Descriptive statistics are shown in Figure 8 and Figure 9.

Fulfilment of 7th criterion IQA of program accreditation from 93 accredited programs:

Fully met	Provisionally met	Not met
82	11	0

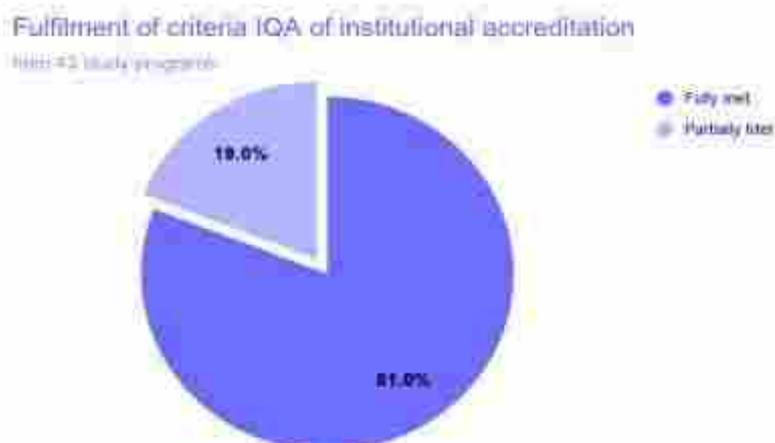
Figure 8



2. Fulfilment of 9th criterion IQA of institutional accreditation from 43 accredited HEIs:

Fully met	Provisionally met	Not met
34	8	0

Figure 9



5. Document analysis on international accreditation

In total, 16 programs from Mongolian HEIs went through international accreditation by Germany's QAA, ASIIN. Between 2018 and 2020, 10 of these decisions were made and all received the mark of "partially met" on the criterion for IQA. Four of these institutions had previously been successfully accredited by MNCEA. We can see that there may be a gap between the accreditation assessment and the real state of IQA at Mongolian institutions.

6. Document analysis on part of IQA in evaluation report and SARs

The IQA criterion usually accounts for the smallest part of reports, typically amounting to 1-2 pages. The repeatable recommendation of the evaluation report from evaluators was to establish the systemic IQA and develop the continuous improvement cycle. According to the SARs reviewed for this study, HEIs included details on the establishment of the IQA unit, the appointment of IQA specialists, the approval order of IQA policies and manuals, stakeholder surveys, and some events regarding IQA. In response to this criterion, HEIs are required to show that they have regular internal quality assurance mechanisms directed at continuous development with the involvement of stakeholders. According to the SARs reviewed for this study, very few of the HEIs included analyses of program-level outcomes, evidence of implementation of IQA results, or and input by stakeholders in IQA procedures. Most HEIs stated that these steps have not yet been implemented. Martin (2018) notes that employer surveys can be conducted to collect information from employers on their assessment of graduates, concerning, in particular, the extent to which they think they fulfil the requirements of the labor market. In this review of SARs, I found that many HEIs reported regularly conducting stakeholder surveys and trying to involve relevant stakeholders in quality mechanisms. However, there was little evidence to support the idea that the evaluation results of HEIs were used for continuous improvement. Also, measures and indicators described for program quality improvement were vague. It appeared uncertain whether HEIs were ensuring that quality assurance results were actually used for program improvement. Identification of responsible units and individuals involved in taking and implementing decisions was similarly unclear.

7. Comparing private and public HEIs through accreditation evaluation reports

The IQA function of public HEIs is more developed than private HEIs in many respects, such as budgets, professional human resources, and performance. In particular, HEIs under the Ministry of Defense, Justice and Internal Affairs and Health have IQA units with adequate HR and budget. Usually, in private universities, IQA specialists' job duties are added on as extra duties.

8. MNCEA's IQA activities

2018 marks the year of IQA in Mongolian higher education. MNCEA invited Dr. Michaela Martin, a Program Specialist at IIEP-UNESCO to conduct a series of IQA capacity-development workshops for representatives of HEIs. Moreover, MNCEA translated her book *'Internal quality assurance: Enhancing higher education quality and graduate employability'* into Mongolian language in 2018. In May, 2020 MNCEA organized workshops on the IQA criterion of assuring research excellence in higher education. The keynote speakers included IQA experts from Chinese Taipei, Russia and Armenia. For the last two years, MNCEA organized seminars on best practices in IQA for Mongolian HEIs. Each year, 6 HEIs shared their best practices with other HEIs. All this activity notwithstanding,

there are 20 officials in MNCEA, but none of them is specialized in IQA. According to their job descriptions, none of them is in charge of IQA.

9. Discussion and conclusion:

Mismatch between the accreditation assessment and reality

The results of a questionnaire and in-depth interviews of stakeholders representing 29 HEIs, including academic staff, IQA specialists, coordinators and evaluators of MNCEA, indicated that participants viewed their institutions as not fully satisfying internationally based IQA criteria. Respondents predominately perceived the IQA level of Mongolian HEIs to be very low. Counterintuitively, 65% of the survey's participants were the evaluators who assessed the HEIs and made a decision that criterion IQA was fully met. (85% of the accredited programs and institutions were fully passed with the IQA criterion).

To sum up, the result of accreditation assessments (fully met, partially met, not met) did not match with the results of the survey. Why is there such a difference? I worked to clarify this issue in the interview portion of the study. According to the responses on open-ended interview questions, study participants stated that as the average IQA level of Mongolian HEIs is very low, evaluators usually do not assess the IQA criterion very seriously. They only check whether they have an IQA unit and activities in place, basically more on input rather than on process and outcome. Due to the low level of IQA in Mongolian HEIs, accreditation evaluators may tend to be lenient in grading the IQA criterion. In the future, this could affect the performance of HEIs. Giving all HEIs grade as would also hurt the job market specially for the matter of whether university graduates are well prepared to meet employers' needs. Evaluators tend to assess only the input aspect of IQA but not the outcomes.

Same criterion but different results of international accreditation agency and National accreditation agency.

One of the interviewees mentioned that his faculty's study program received the mark of "partially met" on the IQA criterion from an international accreditor, but was successfully accredited in the national accreditation, even though they have the same criterion. This shows that MNCEA's accreditation assessment is not reliable on the IQA criterion. In the last 2 years, none of programs and HEIs have received the mark of "not met" on the IQA criterion. According to MNCEA accreditation results, around 85% of the accredited programs and HEIs fully satisfied the criterion IQA. This sounds good on paper, but it does not seem to be true in reality. This inconsistency raises questions about the effectiveness of current IQA processes, policies, and manuals. Illusory successes and unreliable evaluations will impact negatively on the development of IQA in Mongolian HEIs. As the main body responsible for quality assurance, MNCEA should address this issue more seriously and take actions to improve immediately.

Findings from both the interviews and the document analysis showed evidence of negative experiences associated with national accreditation results. Last year, four nationally accredited programs received an IQA mark of "partially met" from ASIIN. This reveals a gap between the accreditation judgement at the national and international levels. Even if MNCEA's accreditation

criterion is aligned with the international standards, the assessment and evaluation judgement is not consistent with the international standards as applied by ASIIN, for example.

IQA of Public HEIs are better than private HEIs

The IQA performance in public HEIs is more fully implemented than one in private HEIs. The budget for IQA is relatively low in private HEIs and IQA specialist job duties often added onto existing (already full-time) roles. Finally, many private HEIs do have not established IQA units, but instead have only one IQA specialist, suggesting as they may not attribute as much significance to the IQA function.

Most of academic staff hesitate in agreeing that “IQA unit improves the quality of the program”

Significant percentages of survey respondents and interviewees stated that, given the current situation and capacity of IQA units, IQA cannot improve the quality of HEIs. The findings suggest that the HEI community does not currently believe in the benefits of IQA. They do not see the tangible effect of IQA in their improvement efforts.

IQA is only IQA unit`s task

An analysis of existing literature revealed that methods of evaluating IQA effectiveness have relied too heavily on the experiences of quality officials, while neglecting the perspectives of other relevant stakeholders. (Westerheijden et al., 2007).

Most people including evaluators, coordinators, academic staff do not agree that IQA is accountable to everyone. The quality improvement should be both bottom-up and top-down including involvement from high-level managers, administrators, and academic staff. However, this is not the case in Mongolian HEIs. The HE community will need to change its mindset, increase the inclusiveness of IQA processes, and work more closely with IQA units.

IQA units only do few of its expected functions

The findings show that many functions and tasks of the IQA unit are missing, according to the perceptions of participants in this study. Of course, this is likely because of the lack of financial resources and professional human resources. Mongolian HEIs have not yet established an IQA system, which successfully involves all HE stakeholders channeled through relevant administrative units and individuals. To date, it seems, most institutions have established isolated IQA units instead, and have expected them to perform all of the complex functions entailed in IQA.

IQA units put emphasis on conducting surveys. However, little attention is given to using the results and findings to improve follow-up actions. Units may conduct surveys regularly and perform data collection very well. Nevertheless, the key steps of a PDCA quality approach, such as analyzing the data, reporting findings and recommendations to all stakeholders, and prioritizing actions, are missing. Survey respondents rated the IQA level of their respective HEIs as very low. It seems advisable, therefore, that the current structures of IQA units, financial resources, and human resources that HEIs devote to IQA should be examined and improved. In order to implement comprehensive IQA systems at Mongolian HEIs, the IQA unit should be reconceived to expand its authority and power. The most effective solution would be the establishment of branches at all levels

of the HEI such as department level, faculty level and institutional level. At the institutional level, the umbrella unit would be the QA Directorate which would report directly to the President of HEI.

MNCEA

Since MNCEA added the IQA criterion to its accreditation standards, 85% of accredited HEIs have added IQA specialists or IQA established units and 78% of them have policies and other related documents. Even so, there is no valid confirmation that the current state of IQA has actually improved the quality of education offered in Mongolian HEIs. The main findings on current IQA practices raised questions about the effectiveness of units, policies and manuals. Current practices are missing a clear model for IQA processes and procedures. Study findings confirm that the progress and effectiveness of the IQA system is currently perceived by stakeholders to be very low.

Mongolian HEIs have worked for 8 years to establish and implement IQA. Ideally 8 years would be a sufficient period for moving to the next level of implementation, called “effectiveness of IQA.” According to stakeholders' responses, however, HEIs still lack proper effective IQA systems, processes, and units. A most urgently needed first step forward will be to initiate a broad discussion among HEIs and stakeholders regarding the issues identified above. Implications of this study also call for further research on IQA including case studies of IQA practices at Mongolian HEIs.

10. Recommendations:

Recommendations for the national QAA

As the National QAA, MNCEA should prepare manuals, templates, and standard training on IQA for Mongolian HEIs. Evaluators need to be trained, to improve their assessment methods, especially regarding the IQA criterion. International evaluators who assessed the Mongolian HEIs should be invited to share their experience with Mongolian accreditation evaluators, in order to build their capacity. Guidelines should be developed explicitly for the current context of Mongolian HEIs considering elaborate needs assessment and extensive review of international best practices. Also, MNCEA should establish a platform for Mongolian HEIs to share and exchange promising practices and information on IQA. MNCEA should research trends in IQA internationally and advise HEIs accordingly.

Recommendations for HEIs

HEIs' IQA processes do not appear to be inclusive of all relevant stakeholders. Quality assurance is the responsibility of all members, units and levels of university. Quality improvement is both a bottom-up and top-down process of change. Thus, administrators should encourage academic staff and other stakeholders to play an active role in quality assurance. The need for participatory processes should be clear in QA policies. Moreover, clear and explicit performance indicators of IQA should be set via QA policies. HEIs could give more authority and power to the IQA unit and establish a QA Directorate reporting directly to the HEI President. Parallel to the understanding of IQA, there has been a financial problem in IQA. There should be enough budget for IQA support and develop IQA specialists' capacity to conduct surveys, perform analyses, share findings, and promote action. HEI administrators should ensure that the IQA unit can work independently and transparently. Also, the IQA survey findings and recommendations should be reflected in administrators' decisions and follow-up actions. IQA units should complete analyses of self-evaluation reports and survey results,

to identify issues that need attention or improvement. Survey reports of findings with recommendations should be developed and introduced to all stakeholders, in order to inform and improve the quality and processes of HEIs.

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Designing and Implementation of Outcome-Based Education in Bangladesh HEIs: Evaluation of Quality Assurance Aspects during COVID-19 Period

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Abstract

Improving the quality of tertiary education of Bangladesh is vitally necessary to spur the country to a higher growth trajectory for attaining vision 2021-2041. For achieving the target of quality education, the GOB and the World Bank has generously funded the project “Higher Education Quality Enhancement Project (HEQEP)” in which self-assessment programs were done first time in in Higher Educational Institutes of Bangladesh. From this, it was observed that there is wide variation on evaluation aspects into the universities regarding quality assurance criteria. Recognizing the urgency of establishing a quality assurance system, Bangladesh Accreditation Council (BAC) was established in March 2017 and started functioning from May 2020. Because of the increasing interest in student learning outcomes in recent years, the University Grants Committee (UGC) of Bangladesh decided to promote the adaptation of outcome-based approaches among its funded institutions in 2020. But due to COVID-19 pandemic, activities of accreditation process have been disturbed abruptly. Although COVID-19 boosts digitization of higher education in Bangladesh, a need of development of blended learning strategies has been created in order to assure the quality in higher education institutes of Bangladesh. In this study, a model was proposed for designing and implementation of OBE in HEIs of Bangladesh.

Key Words: Outcome Base Education, Quality Assurance, COVID-19, and HEIs of Bangladesh

1. Introduction

Bangladesh has made remarkable progress in poverty reduction, supported by sustained economic growth. It has been among the fastest growing economies in the world over the past decade maintaining the stable macroeconomic conditions. Country has made remarkable gains in ensuring access to basic and secondary education in the past two decades. In 2018, the country’s net enrollment rate at the primary school level reached above 97 percent and that at secondary school level, around 69 percent. Improving the quality of education remains the largest challenge for Bangladesh at all levels (World Bank, 2021 & 2019). Improving the quality of its tertiary education is vitally necessary to spur the country to a higher growth trajectory for attaining vision 2021-2041 of the Country (IQAC Manual, 2015). The ‘Vision 2041’ has been adopted in line of ‘Vision 2021’ to provide impetus to the development dream of the nation. Its aim is to end absolute poverty and to be graduated into higher middle-income status by 2031, and eradicate poverty on way to becoming a developed nation by 2041. According to the higher education strategies of this vision, accreditation process will be strengthened to pay due attention to quality aspects of private colleges and universities in terms of physical facilities and staffing quality (GED, Bangladesh Planning Commission, March 2020). Tertiary education in Bangladesh, currently, has been facing many deeply rooted and intertwined challenges. These include, inadequate enabling environment for improving the quality of education

and research, weak governance and accountability, poor planning, monitoring capacities, and insufficient funding. These drawbacks can only be mitigated by developing a quality culture and ensuring good practices in higher education institutes (HEIs). Until 2017, there was no recognized quality assurance (QA) mechanism for public and private universities in Bangladesh. The deficiency was recognized in the UGC, University Grants Commission as the intermediary between the Government and universities for regulating the affairs of all the universities, and Government of Bangladesh National Education Policy published in 2010. Improving the quality of higher education entails improving curriculum, faculty, physical resources, academic facilities, and research opportunities. The curriculum of Higher Education study should be outcome based, driving by the global achievement of bridging the gap between job market demand and supply of skilled graduates passing out from the universities. To ensure the target objective, universities should adopt and practice outcome-based education model. OBE methods have been adopted in education system around the world at multiple levels. Because of the increasing interest in student learning outcomes in recent years, the University Grants Committee (UGC) of Bangladesh decided to promote the adaptation of outcome-based approaches among its funded institutions to judge whether the processes and deployment of resources are effective in enabling students to achieve the intended student learning outcomes (UGC Bulletin, 2020). Implementation of OBE processes has been endorsed by many countries such as Hong Kong, China (Hong Kong University Grants Committee, 2008) many years ago. Clear understanding and articulation of intended learning outcomes facilitates the design of an effective curriculum and appropriate assessments to measure achievement, and to plan the learning process for individual students (City University of Hong Kong, 2010).

2. Quality Assurance Practice in Bangladesh

A quality Assurance Unit (QAU) within the organizational structure of university Grants Commission (UGC) of Bangladesh was created under HEQEP project to initiate the QA mechanism. The QAU functioned as a temporary council until the formation of the national Quality Assurance and Accreditation Council, Bangladesh (QAACB) from 2016. Later on Bangladesh Accreditation Council (BAC) was established in March 2017 and started functioning from May 2020, with the responsibility to promote and ensure quality assurance in higher education in Bangladesh through implementing qualification framework and accredit the academic programs and higher education institutes. After the formulation of National Qualification Framework of Bangladesh for Higher Education (NQFBHE) which was approved on 04 March 2021 by Ministry of Education, GoB, which is an essential tool for BAC to accredit any program and/or institute. Bangladesh Accreditation Council (BAC) Standards for Accreditation of Academic Program has been approved by the 4th BAC meeting on 2021.

3. Outcome Based Education: Theory and Practice

- Outcomes-Based Education is an “educational model in which
- curriculum
 - pedagogy and
 - assessment

are all focused on student learning outcomes” (Driscoll & Wood 2007 p.4). Outcomes are “not the score, label, grade, or percentage that someone attaches to the demonstration, but the substance and actions of the demonstration itself” (Spady, 1998, p.25). Williams (cited in Tavner, 2005) defines the characteristics of outcomes:

- should be achievable and assessable;
- instruction should make a difference;
- should be transparent and fair;
- should indicate where learners have not achieved; and
- reflect the result of learning, not process.

Meanwhile, Spady (1998) is very clear that outcomes should state what students can do when they exit the system. Learning outcomes are stated expectations of what someone will have learned, which inform curriculum, teaching and assessment. They are designed to promote more effective learning at all levels (Driscoll & Wood, 2007). In fact, OBL is a “designing down” approach (Spady, 1994) to curriculum development, which means that, once the long-term significant outcomes have been defined, they become the starting point for curriculum design (Killen, 2009). In this way, the outcomes define the curriculum, which means the learning outcomes have become the guiding principles in curriculum design. In a word, the curriculum design starts with what learners are expected to learn, followed by the design of teaching and learning activities that will assist learners to achieve the intended learning outcomes, and ends with the use of assessment that can provide feedback about the level of learning that has been achieved. In OBE, the outcomes are first defined and then the design of the curriculum including the teaching/learning activities (TLAs) and assessment tasks (ATs) follow.

4. Designing and Implementing of OBE

OBE implementation is to ensure the academic programs, the delivery systems and methods of valuation will produce capable and high-quality graduates. There are three main objectives needed to be achieved in the implementation of the OBE. The objectives are the results of the Course Outcomes (COs), the Program Outcomes (POs) and the Program Educational Objectives (PEOs). The objectives should be measured to determine the level of knowledge, skills and abilities of all students after completing their courses.

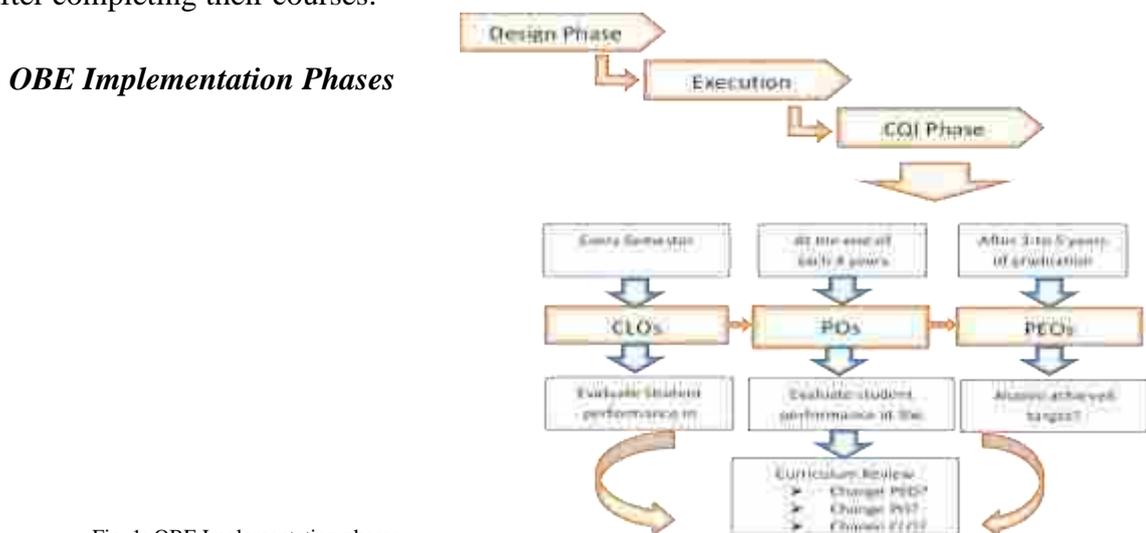


Fig. 1: OBE Implementation phases

- Design Phase starts from university vision and mission then design PEO’s/PA’s from it. Then Program Outcomes (POs)/Learning Outcomes (LOs) are designed from PEO’s/PA’s and then Course Learning Outcomes (CLOs) are designed from POs/Los.
- Execution phase consists with measurements of CLOs, POs and PEOs
- Continuous Quality Improvement phases comprised with curriculum review (if any) after evaluation of student performance and alumni feedback.

4.1 Background: Higher Education Quality Enhancement Project (HEQEP) Project

The present government is committed to change the landscape of higher education through enhancement of quality of higher education and research in the country. For achieving the target of quality education, the GOB and the World Bank has generously funded the project which is known as Higher Education Quality Enhancement Project (HEQEP). Establishment of Quality Assurance Mechanism is one of the major components of HEQEP.

Evaluation of Self-Assessment Criteria for QA

In order to assess the programs offered by the entity (Department/Institute/Faculty) nine criteria were considered with setting standards. These include governance, curriculum content design & review, physical facilities, teaching-learning & assessment, student support service, staff & facilities, research & extension and process management & continuous improvement. For collecting information regarding standards of specific criteria five survey questionnaire for stake holders (employer, student, alumni, academic and non-academic staff) were developed (Annexures: Questionnaires) (Self-Assessment Manual, 2016). Among these, curriculum design and teaching-learning are considered here.

Samples

Self-assessment of the programs of HEIs in Bangladesh during the period 2015 to 2018 was the first attempt in order to evaluate whether quality standards are being met or not. Among the public and private universities of Bangladesh, 28 public universities and 48 private universities were considered for funding. I reviewed more than twenty (20) self-assessment programs in different universities of Bangladesh as external quality assurance resource personnel. In this study, five (05) universities are taken as samples in the context of different discipline and universities located in five divisional cities of Bangladesh.

Data Analysis

Stakeholders' responses were collected in numeric scale (Likert) ranges 1-5, as stated in different questionnaires (Appendix: Sample Questionnaires). These responses were converted to score, which is actually a weighted average/mean. Firstly, the numeric weight of any response was multiplied by total number of responses for any aspect to get weighted sum index value. Then, weighted sum index value was divided by total number of respondents of that aspect to calculate the score.

Curriculum Content Design & Review

For QA criteria-2, curriculum design and review, 05 standards were considered and to evaluate whether quality standards are being met or not, 05 aspects for alumni, 04 aspects for student and 08 aspects for academics were considered. Among aspects, courses in the curriculum from lower to higher levels are consistently arranged, teaching strategies are clearly stated in the curriculum, assessment strategies are explicit in the curriculum and curriculum load is optimum and exerts no pressure are noteworthy.

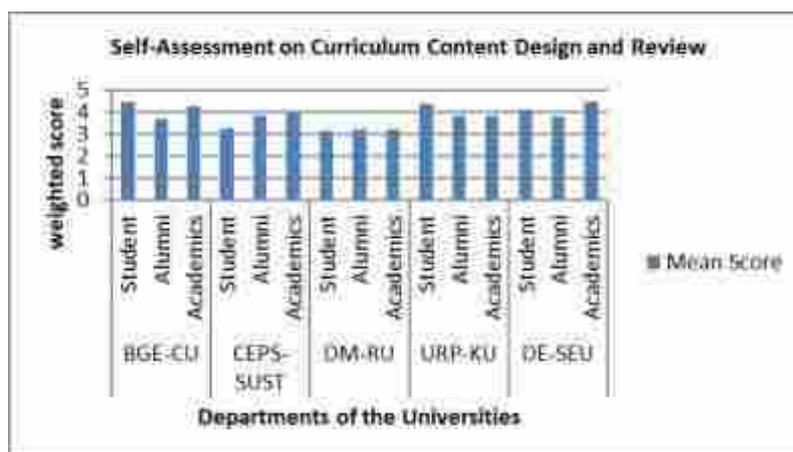


Fig. 2: Evaluation of self-assessment on curriculum content design and review

Teaching-Learning & Assessment

For QA criteria-5, teaching-learning and assessment, 10 standards were considered and to evaluate whether quality standards are being met or not, 12 aspects for alumni, 11 aspects for students, 14 aspects for academics were considered. Among the aspects, teaching-learning is interactive and supportive, entity provides adequate opportunities for practical exercises to apply in real life situation, modern devices are used to improve teaching-learning process, diverse methods are practiced to achieve learning objectives and Lesson plans/course outlines are provided to the students in advance are noteworthy.

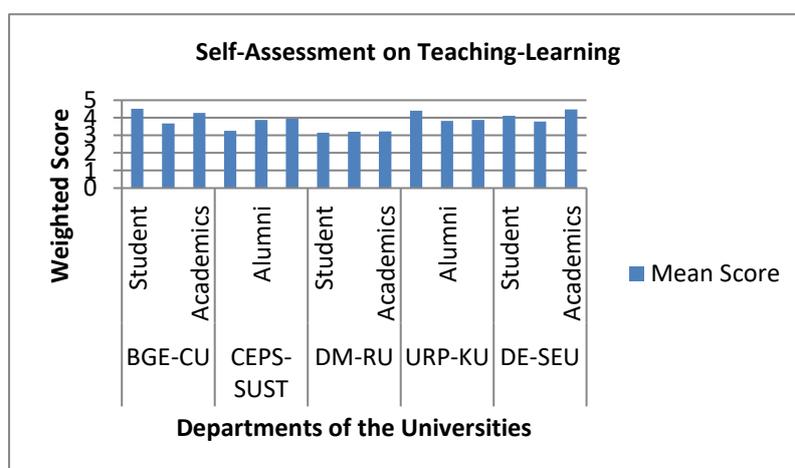


Fig. 3: Evaluation of self-assessment on teaching-learning

From these data it was observed that there is wide variation on evaluation aspects of the perception of stakeholders and universities. However, it was first attempt to get a scenario on quality assurance aspects of public universities of Bangladesh.

4.2 Proposed Model for Designing and Implementation of OBE

Identification of Employer's need is prerequisite for selecting the graduate attributes from which programs outcomes are developed (Fig.4). Course learning outcomes are developed with alignment of POs and assessment matrices are developed for attainment of POs. Implementation is completed through measurement of COs, POs and PEO followed by development of Continuous Quality Improvement (CQI) strategies.

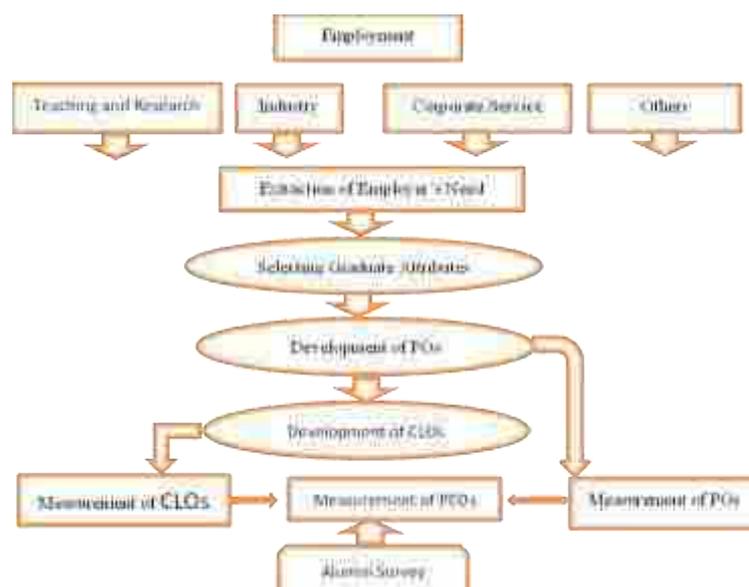


Fig. 4: Proposed Model for Designing and Implementation of OBE

4.3 Designing the Course Learning Outcomes (CLOs)

In the past, courses of the program were described according to the content to be covered. The focus was on what the teacher would do, while learning goals were expressed in terms of the content the teacher would present to the students. The OBL approach which is a learner-centered model places students at the heart of the educational process. One of the key features of this model is that courses are described in terms of what it is that the students should be able to do on exit. The statements that describe this are called ‘intended learning outcomes.’ When drafting the course intended learning outcomes, we need to keep in mind that ‘intended learning outcomes’ clarify what the student should be able to perform after completing a course (Biggs & Tang, 2007), which emphasize that what the student has to learn is more important than what the teacher has to teach. When designing the Course Learning Outcomes (CLOs), it is crucial to

- (1) decide what kind of knowledge is to be involved, and
- (2) select the topics to teach and decide the level of understanding desirable for students to achieve and how it is to be displayed (Biggs & Tang, 2007).

In other words, the CLOs determine the teaching and assessment strategies and consequently need to be designed with a view to the kind of knowledge and the level of understanding intended. Baume (2005) points out that the ILOs must have the following characteristics:

- Attractive – students want to achieve them
- Comprehensible – students know the meaning
- Attainable – students can learn to achieve them
- Coherent – they clearly fit into their Program

Before piloting the course using the OBL approach, the author reviewed the old course outline and converted it into OBL format using an OBL course outline template provided by University Grants Commissions (UGC), Bangladesh. Table 1 shows how the old course contents were converted into CLO based pilot course ‘Chemistry Research Methodologies’. Having designed the CLOs, the next task was to check if the Program Learning Outcomes (PLOs) and the CLOs were aligned. When aligning CLOs with the PLOs, it was ensured that the CLOs address the PLOs properly. It is not necessary for one individual course to address all the POs, but it is important that all the courses offered in the program collectively address all the PLOs. In this way, after students have completed all the courses successfully, they should have achieved all the PLOs as well. Once the alignment between the PLOs and CLOs was confirmed, the next step was to align CLOs with (a) the

teaching/learning activities (TLAs) and (b) the assessment tasks (TAs), which are the critical tasks for the design of a constructively aligned curriculum.

Table-1: Comparing CLOs based curriculum with traditional content-based syllabus

<i>Traditional content-based Syllabus</i>	<i>CLOs based curriculum</i>
<p>In traditional system, only contents are presented into syllabus.</p> <p>Program outcomes are not mentioned</p> <p>Objectives of the study and course learning outcome were not mentioned.</p> <p>There was no reported alignment of learning outcomes with program outcomes.</p> <p>There was no declared assessment matrix into the curriculum.</p> <p>Aligned assessment scheme with learning outcomes were not reported.</p>	<p>Course Learning Outcomes (CLOs) <i>Upon successful completion of the course, students will be able to</i></p> <p>CLO1: Demonstrate the overview concepts of research and its importance in chemistry</p> <p>CLO2: Explain the types of research applicable to chemical science</p> <p>CLO3: Identify research question and state research problem</p> <p>CLO4: Formulate research hypothesis and test the hypothesis</p> <p>CLO5: Describe data collection methods and analyze the data</p> <p>CLO6: Develop Design of Experiments (DoE) with different methods for chemical research</p> <p>CLO7: To write and demonstrate research synopsis, research proposal, research report, and impact of research</p> <ul style="list-style-type: none"> • CLOs are mapped with PLOs and assessment schemes are aligned with CLOs.

4.4 Design of Teaching and Learning Activities

In order to implement effective teaching and learning activities (TLAs), there are certain criteria to meet such as: (1) Does the task build on previous relevant knowledge? (2) Does it require the learner to be relevantly active? (3) Does it allow for the learner to be reflective as learning progresses (Biggs & Tang, 2009)? If the task falls short on any of these criteria, it should be redesigned. Whatever the TLA, it should pave the way for students' achievement in lifelong learning by encouraging their awareness of their own knowledge construction, largely by placing them in situations that require them to self-monitor and self-direct their own learning. After finalizing the course 'Intended Learning Outcomes', it is crucial that the TLAs are designed in a way to help the students to achieve these outcomes. For example, if one of the learning outcomes of a course is collaborative learning, it is necessary to design activities such as group projects and group oral presentations. Likewise, if another learning outcome is to demonstrate high level of academic literacy, then it is crucial to ask students to carry out online and offline academic reading, write literature reviews, and carry out other activities related to academic writing, such as studying referencing rules.

4.5 Design of Assessment Strategies

Other than the TLAs, the assessing strategies (AS) must also be revisited and if necessary revised so that they are aligned with the learning outcomes. In the past, when lecturers took the objective-oriented approach, it was often found that some of the learning objectives were not addressed by any of the assessment tasks. When taking the OBL approach, we need to ensure that all the learning outcomes have been addressed by the assessment tasks to some extent. Without doing so, it will be highly problematic to show whether students have achieved certain learning outcomes by the end of a course. Therefore, we need to select assessment tasks that will tell us whether and how well each student can demonstrate the course intended learning outcomes. Earlier there were no prescribed formative and summative assessment strategies. The limited assessment tasks without rubrics in the old course outline failed to totally reflect the key knowledge and skills the students would obtain in

the course, while in the OBL course outline, the number of assessment tasks has increased to required numbers, which can help to assess all the CLOs.

Having designed or revised the assessment tasks, it is important to come up with a set of criteria which address the CLOs directly. It is also important that all the CLOs are addressed somewhere by the criteria designed for different assessment tasks. In the past, there was no rubric-based assessment. After adopting the OBL approach, three different sets of rubrics of assessment criteria were developed based on the following principles:

- The Assessment Criteria should map with the CILOs.
- The criteria should be articulated in a transparent way.
- The criteria need to be observable and easy to be measured with evidence.
- The criteria should demonstrate what our expectations on the students are.

These sorts of schemes can ensure that CILOs are assessed and evaluated in a proper manner.

4.6. Measurement of Learning Outcomes Achievement

Content knowledge is no longer sufficient for higher education and career success. In order measure learning outcome measurement, it is important to solve the following questions: How valuable does an organization/institution think generic skills are? What assessment are currently using or recommending (if any) to measure students' generic skills as part of quality assurance? Learning outcome achievement measurement tools can measure students' essential higher education and career readiness skills, providing valid and reliable insights into students' preparedness for their next step. One of the essential skills is critical thinking and problem-solving skill. These skills are predictive of positive higher education and career outcomes. Performance-based and custom assessments authentically measure students' essential higher education and career readiness skills and identify opportunities for student growth. Students who lack essential higher education and career skills of critical thinking, problem solving, and effective written communication are the ones at risk for not completing higher education (Venezia *et al.*, 2005). While content knowledge is a requisite part of a student's education, it alone is insufficient for a student to thrive academically and professionally (Rios *et al.*, 2020). Before doing this, first step is course learning outcome measurement. In Bangladesh's HEIs, there are no formal templates regarding the learning outcomes achievements measurement.

Piloting, Evaluating and Reflection of the Course

In 2020, the author piloted OBL in the course "Chemistry Research Methodology" with reference to the newly designed OBL course outline which had been reviewed and revised based on the advice from the External Peer Reviewers during program self-assessment. At the beginning of the course, the author explained the course outline to the students thoroughly, emphasizing the CLOs of the course. When assigning assessment tasks to students, the author emphasized the alignment between the assessment tasks and the CILOs. In order to find out whether the CLOs, TLAs and ATs were properly aligned with each other, and whether the teaching of the course was effective, the author carried continuous assessment (quiz, assignment and presentation) as formative assessment and two Mid-Term exams and semester final examinations as summative assessment for evaluation of the course on OBL. Also, self-reflection was carried out for further improvement of the course. Schon (Cited in Killen, 2007) suggests two approaches to reflection: 'reflection-on-action' and 'reflection-in-action'. The former approach is the typical self-evaluative thinking that teachers engage in after most lessons. It is a deliberate attempt to understand past events in order to shape future action. While the latter occurs "on the run", teachers simultaneously teach and analyze what they are doing, why

they are doing it and how the learners are reacting. The author, being a reflective teacher, adopted the two approaches in reflection. I followed a cycle of monitoring, evaluating and revising his practice continuously and this could be evidenced by his revising the assessment tasks again after piloting the course

‘Chemistry Research Methodology’

Table 2: Measurement of course learning outcomes achievement

CLOs	Components	Assessment Contribution (C)	Weightage(W)*	Average Marks % (M)	CLO Average ** (A)	CLO Attainment
CLO1	CA	4.0	0.11	74.0	73.91	Attained
	MTE	7.0	0.20	78.0		
	SFE	24.0	0.69	66.0		
	Total					
CLO2	CA	2.0	0.05	63.5	68.45	Attained
		5.0	0.14	75.3		
	MTE	6.0	0.16	71.0		
	SFE	24.0	0.65	64.0		
	Total					
CLO3	CA	5.0	0.18	78.3	72.02	Attained
		4.0	0.14	64.3		
	MTE	7.0	0.25	77.0		
	SFE	12.0	0.43	69.0		
	Total					

Note: * $W=C/T$; ** $A = \sum(MXW)$

Course Evaluation by Indirect Method:

Students were asked to fill in the mid-course evaluation form in the middle of the course. Indeed, almost all of them agreed or strongly agreed that: the CILOs are clear (Item 1); the teaching & learning activities help them to achieve the learning outcomes (Item 2); the assessment tasks are relevant to the learning outcomes (Item 3); and the assessment criteria of the activities are clear enough (Item 4). Item 5 (I feel confident about achieving the intended learning outcomes at the end of the course) has the lowest mean score of 3.52 among the five (which is still quite high), indicating that students were slightly uncertain about whether they could achieve the intended learning outcomes at the end of the course. Considering they were only half way through the course, such doubts are understandable and might change later in the course.

5. Evaluation on Progress of OBE during COVID19

In Bangladesh, from 17 March of 2020 all public and private universities have been closed till to date due to COVID-19 pandemic. Due to this, continuation of teaching learning activities into the universities was one of the great challenges. Online teaching has emerged onto the global higher education stage as a leading means of “adjusting to new normal environments” which suggests becoming a “disruptor” in higher education. Naturally, the definition of “quality” in higher education (HE) should be redefined amidst the rapidly changing expectations and conditions brought on by 2020. The question is how do internal quality assurance (IQA) and external quality assurance (EQA) monitor newly online teaching provision in higher education and develop future provision in a reliable and efficient manner? What is the quality of online courses and what are the outcomes of such training? Can we trust the quality of online education and the qualifications of graduates who have been trained online? The results of “APQN survey on COVID-19 impact in Higher Education Institutions” conducted from March to May in 2020, shows 68% of the respondents are “not satisfied” with online teaching, while “APQN Survey on Effectiveness of On-line Teaching” conducted in July in 2020, shows 34% respondents think online teaching is “inefficient”. At APQN 8th forum entitled “Influence of COVID-19 on Higher Education Quality Assurance” held on July 28 in 2020, an urgent demand made APQN decided to develop APQN Standard for Online-Teaching Quality Assurance.

After the key elements of standard for online-teaching quality assurance were developed by Delphi Method at the beginning of 2021. Based on the Survey on “APQN Standard for Online Teaching Quality Assurance” was conducted in April, here is the final version of “APQN Standard for Online-Teaching Quality Assurance”, endorsed by the 6th Board of APQN (APQN, 2021).

COVID-19 boasts digitization of higher education in Bangladesh and created a need of development of blended learning strategies through assurance of quality in higher education institutes of Bangladesh.

6. OBL Implementation: New Challenges to Teachers and Learners

6.1 Challenges to Teachers

Teachers are very familiar with content-based syllabus design which starts with identifying the content that the students have to study or learn because that content is considered to be important. However, there is a significant difference between outcome-based education and content-based education. OBE does not deny the importance of content, but OBE does require content to be used as a vehicle for helping students to achieve pre-specified outcomes – so the selection of content follows the selection of outcomes (Killen, 2007). Therefore, using outcomes to guide instructional planning is a very challenging task.

Well written outcome statements are not easy to design. It is because when writing outcome statements with action verbs, we have to force ourselves to think about the ways in which learners could possibly demonstrate their learning, and these must indicate the complexity of the learning that we are expecting. Also, we need to remember that outcomes must be clear and sensible. It is also true that developing an outcome-based system requires making tough decisions about learning outcomes that truly matter, and those outcomes must be distinguished clearly from the information that students have been exposed to superficially in the past (Fitzpatrick, 1994).

For OBE curriculum design, educators need to be well prepared and pay considerable attention to structuring learning experiences to help learners achieve the outcomes. Teachers need to be flexible in the way they present information to learners, give them diverse opportunities to learn, and be flexible in their approaches to assessment.

Capacity building that focuses on individual and organizational development is also challenging for the teachers (Fitzpatrick, 1994). To begin with, OBE requires that someone determines what things are “essential for all students to be able to do”. It also requires that these things be expressed in terms that will enable teachers to use them to guide their planning and instructional practices (Biggs & Tang, 2007).

While particular teaching/learning activities (TLAs) need to be aligned with the target verbs in the ILOs they are to facilitate, there are also general criteria all TLAs should meet, whatever verbs they employ. To Biggs & Tang (2007), good teaching was defined as ‘getting most students to use the level of cognitive processes needed to achieve the intended outcomes that the more academic students use spontaneously’. The challenge for teaching, then, is to select teaching activities that will encourage teachers to achieve the ILOs (Biggs & Tang, 2007).

Last but not the least, there are the ‘backwash’ effects of assessment on learning (Biggs & Tang, 2007), meaning we teachers might see the intended learning outcomes as the central pillar in an

aligned teaching system. This is backwash, a term coined by Lewis Elton (1987) to refer to the effects assessment has on student learning, to the extent that the modes of assessment may determine what and how students learn to a far greater extent than the curriculum. In brief, in OBL it is more appropriate to require outcome-related evidence of validity – that is, evidence that we are drawing valid inferences about the achievement of outcomes, rather than about the learning of content (Killen, 2007).

These challenges in establishing an outcome-based instructional system require a tremendous investment of time and energy by all who have a stake in the success of the OBL implementation. The return on that investment can yield significant dividends in terms of student learning and tremendous opportunities usually accompanying the great challenges. We can make a real difference in student learning by leading our Institute through the changes required to create genuine outcome-based systems for teaching and learning.

6.2 Challenges to Learners

OBE does require teachers to approach assessment differently from the way it is approached in a content-based curriculum that uses mainly norm-referenced assessment with emphasis placed on aligning assessment with the outcomes that the students should have achieved. OBL emphasizes creating a quality learning environment so that students could achieve the intended learning outcomes. Students are expected to engage in meaningful learning in a supportive environment which focuses on interactions and relationships between and among learners and teacher. Positive classroom environments motivate learners and create conditions in which learners can achieve their full potential. Students are also expected to achieve the significant learning outcomes to appropriately high standards, and this refers to high expectations, which is one of the basic principles of OBE (Spady, 1994). In this case, teachers will set challenging tasks for learners, try to build on learners' strengths, abilities and interests, and establish relationships that convey interests in the learners and their learning (Ayers, Sawyer & Dinham, 2004). The most important point here is that all learners should be engaged in challenging tasks that encourage them to achieve to the best of their ability (Killen, 2007). When compared to the traditional learning environment, learners now have to take risks and try harder to master challenging academic work than before (Killen, 2007). However, helping learners to achieve high standards is linked very closely with the idea that students require repeatedly experienced success i.e., that successful learning facilitates more successful learning. Students can achieve high standards if they are given appropriate learning opportunities and if they: have a good understanding of the learning outcomes.

Measures to taken:

- All faculty members of the concerned department have to be trained on to develop course learning outcomes and alignment with PLOs with specific activities.
- A project has to be developed by Program Offering Entity (POE) to measure CLOs (course wise), PLOs (program wise) and PEOs (cycle wise)
- Each program offering entity should declared defined Teaching-Learning Plan and Assessment strategies with learning outcome achievement measurement policy.
- Before formal implementation of OBE, piloting of individual course has to be started for learning outcomes measurement (direct measurement) and course evaluation by student (indirect measurement)

- Each program offering entity should have a clear Continuous Quality Improvement (CQI) policy

7. Conclusion

Implementation of OBE in Higher Education Institutes (HEIs) of Bangladesh is in initial state. Self-assessment programs were carried out under the HEQEP project which were not sufficient to promote and establish outcome-based quality education in HEIs in Bangladesh. What attracts the educators and the education policy makers is that OBL helps learners to focus on clearly defined learning outcomes, and they know what exactly they are able to do after completing a course. This makes learning more student-centered. For teachers, instead of focusing on what they want to teach, now they need to think from the learners' perspectives and focus on how they can help the learners to achieve the intended learning outcomes in an effective and efficient manner. To implement OBL successfully, it is essential to first come up with a set of generic outcomes at the institute level, and then develop a set of program learning outcomes which map onto the generic outcomes in a precise manner. At course level, it is important to design attractive, comprehensible, attainable, and coherent course intended learning outcomes based on the program learning outcomes, and ensure that the teaching and assessing strategies are closely aligned with these courses intended learning outcomes. Feedback from students and teachers' self-reflection are important for further adjustment and improvement of the whole practice. These are all crucial steps for us to implement OBL successfully.

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Digitalization of Higher Education from the Lens of Quality Assurance Mechanism in COVID-19 Environment

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Abstract

This research examines the digitalization of quality assurance mechanisms in teaching and learning at National Defence University (NDU) Islamabad-Pakistan influenced by 4.0 Industrial Revolution. At NDU, digitalization is internal process, as the use of digital technology in teaching and learning initiated on directions of senior university leadership. Before implementation of digitalization, there was only limited reported use of technology for teaching and learning, but through progressive trainings and hands on practices to faculty and supporting staff, NDU has successfully implemented the quality assurance processes to become a model smart university. The researchers collected data from a sample of 200 faculty and students using survey and analyzed through SPSS. The findings offer valuable insight that 61% faculty and 87% students prefer using digitalization of quality assurance for academic processes. This paper discusses possible challenges for these digitalization processes with reference to quality assurance and thus illuminates how processes of digitalization are being implemented and maintaining quality as well. The recommended processes of digitalization can also be improved by innovative ideas and good practices by researchers. Regional and global HEIs may take lead from this study while planning and undertaking new research initiatives for digitalization of quality assurance processes and their recognition.

Keywords: 4.0 IR, Digitalization, Quality Assurance, Capacity Building, Qualification, COVID-19

1. Introduction

We are now in the era of the industrial revolution 4.0 known as the era of digitalization or automation in various sectors of life (H. Suwardhana, 2017: 102-110). Digitalization as a foundation of 4.0 IR, is entering in Pakistan Higher Education Institutions (HEIs). Presently generation enrolled in HEIs is true digital natives: from early youth, they have been exposed to the internet, social networks, and mobile systems. These students are grown up with smartphones and other digital devices at their fingertips. An individual student can understand the fact that he can get a faster response from teachers by sending a text message or WhatsApp message rather actually trying to talk to them in person even if they are present in the same institution. According to Dorsey and Jason “Social media is the medium that connects the world, more than any other channel or communication option” (Dorsey, Jason, 2016). The phenomenon of quality assurance in higher education is widely used to signify the practices whereby academic standards, i.e., the level of academic accomplishment achieved by higher education students are improved and maintained. In today's digitized era, quality education is one of the Sustainable Development Goals (SDGs), where university's responsibility is to aim at the formation of personalities and intellectual abilities of the graduates through ensuring quality of education in rapidly changing world. There is a growing understanding that HEIs should developed a quality assurance mechanism for digitalization of academic processes for them, keeping in view students' competencies. World is now in the era of the industrial revolution 4.0, therefore, it is need for having an education which is relevant to this era. It is HEIs responsibility to educate

students to become valuable members of digitalized society, without omitting the essence of humanity.

2. Pedagogy

Sciences of education (pedagogic) in charge of investigating how to educate a child and young man reaches maturity, i.e. the extent particular developments in general terms to be accepted fully as citizens of the communities (W. Rasyidin, 2014). Practitioners of pedagogy, is expected to have an understanding of the development of education relevant to the era of the industrial revolution that now thrive. Mobile and computing, cloud, social network and big data are those innovations that created a lot of opportunities to design a learning environment that enhances unconditional personalized learning. With the help of this system of learning and student's preferences, there will be flexibility for students to design their indigenous educational modules. There is increasing demand of online learning, it will require the use of Massive Open Online Courses (MOOCs) for instance Coursera, virtual classroom, remote labs, virtual labs and experiential learning as important tools. With a rising level of complexity in digitized learning, it will be highly important to maintain quality and develop digitized processes for quality assurance. Innovation being key to success, HEIs should take guidance from I Pedagogy wheel (Figure-I characterized by open-source innovation and learning-by-doing), and utilize as an instrument to increase the capacity building of students for modern technologies and digital applications. With the increased use of these digital mediums of learning will also help to identify the areas for continuous improvement. Further, it will also help to develop QA mechanism for academic digitalization process.



Figure- 1 (i-Pedagogy Wheel)

Source: adopted from Allan Carrington, 20 June 2016

3. Innovative Methods for Digitalization at HEIs

Technology is a means to justify the end of composition outcomes and has become a seamless extension of the curriculum in the classroom. To most effectively teach technology, we must model that technology within our disciplines and classes (Naga PC, 2018). In higher education, digitalization process has its transformation into two broader steps: the new education products for development focused by services transformation and it is also focus on conversion of traditional transformation cycle into digital. Digital process includes videos of offline lectures which could be produced digitally, different kinds of question and content also retrieve digitally with the help of

service transformation the one of the main purposes to develop and build good relation between teachers and the students and try to overcome the communication gap through this service. For instance, it may include converting offline lectures into video ones, creating digital texts and quizzes. It also includes creating digital relationship for communication between students and teachers. On the flip side, Operations transformation mainly deals with processes related with academic management. It includes digitization of all kinds of education related activities in any Higher Education Institutions (HEI) like admission of students, registration of courses, induction of programs, examination and evaluation, assessment of courses and faculty. Quality assurance is also the vital part of operation transformation. Few digitized methods and technologies that are being used: -

- **E-Learning:** “E-learning involves the use of a computer or electronic device in some way to provide training, educational or learning material” (Maneschijn, M, 2005)
- **M-Learning:** “Smartphone allows you to do nearly anything: connect with your peers, work on homework online, play video games, use social media, search for information online and have access to a world of good and bad influences, as well as the latest entertainment” (Dorsey et al, 2016).
- **Blogging:** Blogging is content published as public post. Blogging is being practiced for study sessions.
- **Podcast in Classroom:** “Podcasts are serial recordings, posted regularly online. Basically, producing podcasts is the technology-based equivalent of oral lectures. Much as lectures and news have been shared with listeners, who download the files online. The advantages of podcast are its flexibility, reusability of your lecture”. (Naga PC, 2018).
- **Social Media:** “A social media where individuals are in communities that share ideas and interests. Some popular communities are: Facebook, WhatsApp, MySpace, YouTube, blogs, Twitter and delicious. Facebook and other social media have been hailed as delivering the promise of new, socially engaged educational experiences for students in undergraduate, self-directed and other educational sectors”. (Naga PC, 2018).
- **SMART Boards:** “SMART Board interactive whiteboards make learning a visual, engaging experience for students, which helps deepen understanding and promote retention of course material” (Naga PC, 2018).
- **Moodle:** “It is open-source system to help design your session. Moodle is Virtual Learning Environment which provides staff and students with access to electronic teaching and learning materials such as lecture notes and links to useful websites and activities such as discussion forums, group it is something that lets you capture your experience, note, website and photos”. (Naga PC, 2018).

In addition to that ‘Artificial Intelligence’ (AI) and ‘Internet of Things’ (IoT) are part of the digital transformation at world level and HEIs aren’t exception. Academic leadership and pedagogy experts are already making serious efforts to bring requisite change in response to these innovations. Around us we can see there are hundreds of smart things like but not limited to smartphones, cars and home appliances. These advanced data science and machine learning technologies can help to convert HEIs into a smart campus. The newly digitized innovative software applications are extremely helpful for teaching faculty (like Google Apps and Amazon smart devices), analysis of student’s performance, and much more.

It has been postulated that the industrial revolution 4.0 affects various sectors of life, including education. There has been also a variety of research related to the phenomenon of education in the era of the industrial revolution 4.0. However, such research needs to be enriched with the pedagogic phenomenon research in the era of the industrial revolution 4.0 based on the experiences of university students and faculty as well. As for the formulation of research problems in this research is, "How to digitize education and learning in the Era of the Industrial Revolution 4.0 while assuring the quality mechanism?". The problem formulation is focused into the research questions:

- 1) How is the influence of the industrial revolution era 4.0 and digitalization to education?
- 2) What is the challenge for digitizing education in the era of the industrial revolution 4.0?

- 3) Does faculty need training for digitized methods of education?
- 4) How quality assurance is the relevant to digitized education?

4. Development of Quality Assurance Mechanism for Digitalization

Quality Assurance in HEIs is referred to a planned and systematic process of review in an academic or research institution or program to ensure that quality standards of education, scholarships and infrastructure are being met, maintained and enhanced. Therefore, “standards of quality of higher education in Pakistan need to be improved significantly to achieve the goals of competitiveness with international standards and to create foundations of a knowledge economy and compatibility (Batool & Qureshi, 2006)”. The concept of quality at higher education came from industry and private sector (Newton, 2002). Initially, in the 1980s, quality assurance techniques were presented in UK as a component of the Teaching Quality Assessment (TQA). TQA reliant on an external analysis and evaluation at the institutional level and peer reviews (Cheng, 2010). Then during the period of 1995 – 2001, it was replaced with subject reviews. “Subject review was further replaced by the institutional audit by the Quality Assurance Agency (QAA) for higher education in England (Cheng, 2010)”. Quality Assurance Agency (QAA) was commissioned in 2004 under supervision of the Higher Education Commission-Pakistan as a specialized body to introduce and encourage the development of a quality culture in higher education (Batool & Qureshi, 2006).

Figure-1 Higher Education Commission Pakistan’s Internal and External Quality Assurance Mechanism Before COVID -19



Higher education commission of Pakistan had not been permitted Pakistan universities to offer online degree programs for several years because of concerns about quality and limited mechanisms for oversight and regulation. COVID-19 has paved a way for authorities to adopt e-learning for degree programs in Higher education to continue with the education. Now thanks to COVID-19, now restrictions on online learning have been lifted and first time HEC Pakistan is allowing universities to offer fully online degrees. In order not to become an obstacle for innovation and modernization, Quality assurance must respond to the changing higher education vision. Policy makers and QA practitioners at Higher Education Institutions (HEIs) should devise workable options and suggest way forward to adopt these changes. Addressing to these technological advancements, following is the proposed digitized processes for HEIs with quality assurance at each step as mentioned in table 1.

Table 1. Digitized Quality Assurance Processes (COVID-19 Environment) (Zia et al, 2021)

Sr.	Process	Digitalization	Quality Assurance
	Admission Process <ul style="list-style-type: none"> Admission Test e.g. Entry/ GRE/ GAT/ NAT/ SAT Interview on Skype/WhatsApp Course Registration Conduct of Classes through: <ul style="list-style-type: none"> CMS Zoom MS Team 	Availability of online session on Campus Management System (CMS)	<ul style="list-style-type: none"> Real-time conduct of aptitude test on PC with auto shuffling of questions Regional Centers connected to central interview panel HEC Attested Degrees Biometrics
	Assessment <ul style="list-style-type: none"> Quizzes Assignments Presentations Sessional Examination 	Availability of online session on CMS, Zoom and MS Team	<ul style="list-style-type: none"> Conduct in Computer labs or at home in COVID environment. Upload on student account and pop up when open account Student Teacher relation establish on CMS for exchange of assignment, quizzes etc. Marks update within 24 hours of conduct
	Feedback from stakeholders <ul style="list-style-type: none"> Students Faculty Employer Alumni 	Availability of Quality Enhancement Module on CMS	Emails to their respective accounts with mandatory check on their accounts (linked with final exam admit card for student and performance appraisal weightage for faculty)
	Post-Graduate Research <ul style="list-style-type: none"> PhD Comprehensive Exam PhD Bi-Annual Progress Review Public Defense 	Skype, Zoom, MS team WhatsApp or any video call-based Software	Examiners, Panels and students are virtually available at designated different locations
	Central Data Repository <ul style="list-style-type: none"> Faculty Folder Student Folder Course Folder Digital Library Software HR Module Examination Module Registration Module Executive view for Vice Chancellor & senior management. 	Availability on CMS	<ul style="list-style-type: none"> Monitoring of login activity regularly Incentive link with timely update of account More than 200,000 books available online Employee Management System

Keeping in view the significance of QA for the student's development and their career progression, faculty should acquaint with digitized procedures of evaluation and assessment. They also get IT

based infrastructure for enhancement of their technical skills in process. It is an evident that the Generation Z students are well versed with use of latest technology and technological gadgets. Students should also advise to give their valuable input for better learning of digitalization processes. Furthermore, to have a reliable and a valid academic review, it is recommended that digitalization assessment should be carried out for more than one evaluation method and/or examiner.

5. Method

A survey was conducted in National Defence University (NDU) Islamabad-Pakistan by incorporating faculty and students. Total strength was 200. Data collected was also analyzed using cross tabulation of relevant questions through the known computer software i.e Statistical Package for Social Sciences (SPSS). The research focuses on the experience of university students and faculty.

Data Analysis

Table 2 Gender Distribution of the Respondents (N=250)

Category	Frequency	Percent	Cumulative Percent
Male	119	59.5	59.5
Female	81	40.5	100.0
Total	200.0	100.0	

Table 2 demonstrated that Males (119) are higher in frequency than Females (81) at NDU.

Table 3 Designation Distribution of the Respondents (N=200)

Category	Frequency	Percent	Cumulative Percent
Faculty	85	42.5	42.5
Student	115	57.5	100.0
Total	200	100.0	

Table 3 demonstrated that sample consisted of 42.5% Faculty & 57.5% students.

Table 4 (% within Designation")

Research Question		Designation		Total %
		Faculty %	Student %	
Do you feel comfortable using social media for digital methods vs traditional methods	Strongly Disagree	16.7		7.1
	Disagree	22.2	8.3	14.3
	Neutral		4.2	2.4
	Agree	55.6	54.2	54.8
	Strongly Agree	5.6	33.3	21.4
Total		100	100	100

Table 4 demonstrated that 87% students and 61 % faculty were very interested to use "Social Media as digital tool".

Table 5

Research Question	Designation	
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		Faculty %	Student %	Total %
Do you feel that faculty requires training to use digital media for e-learning	Strongly Disagree	5.6		2.4
	Disagree	5.4		2.4
	Neutral	5.6	12	4.8
	Agree	66.7	45.8	54.8
	Strongly Agree	16.7	42.2	35.7
Total		100	100	100

Table 5 demonstrated that 83% faculty and 88% students were in favour of “capacity building for digitalization of academic process”.

Table 6

Research Question		Designation		Total %
		Faculty%	Student %	
Does future digitized academic process require quality assurance mechanism	Strongly Disagree		4.2	2.4
	Disagree	5.6	16.6	11.9
	Neutral		3.3	38.1
	Agree	44.4	41.7	45.2
	Strongly Agree	50	34.2	2.4
Total		100	100	100

Table 6 demonstrated that 94% faculty and 76% students are in favour of “use of academic digitalization in quality assurance mechanism”.

Table 7

Research Question		Designation		Total %
		Faculty %	Student %	
Does accreditation of digitized programs have quality assurance mechanism	Strongly Disagree		4.2%	2.4%
	Disagree	5.6%	16.7%	11.9%
	Neutral	44.4%	33.3%	38.1%
	Agree	50.0%	41.7%	45.2%
	Strongly Agree		4.2%	2.4%
Total		100	100.0%	100.0%

Table 7 demonstrated that 50% faculty and 46% students are of opinion that “accreditation of digitized programs have quality assurance mechanism”.

6. Discussion of Results

Keeping in view the results, quality assurance mechanism for digitalization of academic process, we need to develop strategy, train HEI faculty and students for adoption of digital processes, accreditation of digitized learning programs and maintain quality for higher employability. This will directly contribute to quantify and uplift of existing quality assurance mechanism in HEIs.

Strategy Development.

In present times, HEIs and HE system as a whole, are facing pressure due to technological advancements and some other issues including quality of graduates, a development of stepwise

strategy is the need of hour. In most of the countries, Quality Assurance processes and practices are not affordable, therefore, each country should keep in mind their resources and develop their indigenous digitized processes in HEIs.

Training of faculty and staff.

A necessary pre-requisite to keep pace with these advancements and adoption of strategy is training of faculty and staff. Involvement of academicians from internally and foreign institutions.

Accreditation and Recognition of Degrees among Global HEIs

“The accreditation agencies develop procedures to determine whether educational programs and institutions meet these standards (Hassan, 2014)”. A network of HEIs across the world with mutually agreed quality standards for digitized learning may provide an accreditation to students to work in other parts of the world. Another challenge is the growing trend of (international) student mobility. With greater number of students choosing to enroll in other countries as part of their degree program; their study plan must be evaluated and benchmarked with the academic work they might have completed in their home country or institution.

Employability

Employer involvement, either formally or informally, in the revision of study programs would help identify the knowledge, skills, and graduates’ attitude needs. Employers may be involved in revision of study programs for students who are under their supervision as interns. There is a need for students to attain variety of dimensions: communication skills- speaking and writing; quantitative abilities, problem solving, understanding of their own culture and of the cultures of others, development of a sense of civic responsibility, for achievement of future employment.

7. Recommendations

- Any country that wants to enhance the international competitiveness of their higher education needs to embrace international standards of assessment or evaluation for their national quality assurance mechanisms. International experts should be invited to participate in evaluation activities. Quality assurance mechanisms need to be more independent of government through a real third-party evaluation so that higher education can be more accountable and credible.
- Universities will need to re-think and re-design the way academic programs will be structured and digitized in the future.
- New approaches and models including examinations and other methods must be developed to test Gen Z students when they complete online degree programs.
- Some developmental work has to be conducted in view of developing new digitized assessment method for different online learning programs.
- To establish digitalized quality standards, there is need to develop regulations of e-learning, innovative teaching approaches and cross border delivery of education, where limited expertise are available.
- Capacity enhancement on digitalization of faculty and staff of HEIs is need of the hour because quality assurance depends on highly qualified faculty and staff and their expertise to learn new technologies.
- Students need to be comfortable with, and able to use, technology. To summarize, every student in the 21st century needs to be able to have a set of skills apart from their technical

know-how learnt in higher education institutions, which enable them to work in a global setting (*Sid Nair, 2013*).

- A system of regional and global collaboration should be involved which include peer reviewing for accreditation purposes, uniform QA system for standards and guidelines for digitized education at global level, recognition of qualification, credit transfer mechanisms and sharing of experiences.

8. Conclusion

Current students are soon going to become the part of the workforce, marketplace and adult society. They think differently from other generations about technology for different purposes like smart phones, social media, privacy and online shopping. “We know the challenges are only going to increase, but we are also hopeful that the opportunities they drive as employees, customers and citizens will increase as well (*Dorsey at el, 2016*)”. “The main challenge then is to ensure that faculty and staff are aware of these best practices, and institutions have processes in place to ensure that guidelines for quality teaching are implemented and followed (*Jung at el, 2102*)”. The recommended process of digitalization can also be improved by innovative ideas and good practices by researcher in other HEIs. There is a dire need to comprehend new technologies, develop innovative and digitized QA mechanism, accreditation and recognition of degrees for employment at national and international level. National and international Higher Education Institutions may take lead from this study while planning and undertaking new research initiatives for hybrid learning focusing on digitalization of academic process for teaching and its quality assurance mechanism

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Exploration of Online Teaching Evaluation Mechanism

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Abstract

With the advent of the post-pandemic era, online teaching has become a normalized teaching mode in Higher Education Institutes. As an important part of online teaching, online teaching evaluation can promote the development of students and improve teachers' professional abilities. However, the current online teaching evaluation mechanism lacks effective monitoring and timely feedback, which makes it difficult for teachers and students to obtain real-time guidance and recommendations. Therefore, based on the running process of online teaching evaluation mechanism, that is, the virtuous circle of online teaching evaluation data collection, analysis and effect presentation, this paper analyzes the process, steps, characteristics and effects of online teaching evaluation mechanism, so as to reflect for the construction of online teaching evaluation mechanism and the guarantee of teaching quality.

Key words: online teaching; evaluation mechanism; quality assurance

1. Introduction

The outbreak of the COVID-19 pandemic forced the world to carry out a large-scale experiment of online education. With the advent of the post-pandemic era, online teaching has become the normal teaching mode in HEIs. Relying on the technological superiority of "Internet Plus Education", online teaching has developed rapidly. However, due to the limitation of time and space and the characteristics of weak interactivity and depersonalization, online teaching has some defects, such as inadequate detection of "teaching" and "learning" behaviors, single evaluation results and superficial evaluation forms, which make it difficult for teachers and students to get timely evaluation and feedback. Therefore, based on the online teaching evaluation mechanism itself (refer to Fig.1), this paper starts from three stages: online teaching evaluation data collection, online teaching evaluation data analysis and online teaching evaluation effect, and analyzes from seven steps: object determination, data collection, data preprocessing, data transformation, data mining, learning analysis and result presentation, so as to present the virtuous cycle operation process of online teaching evaluation mechanism and provide feasible suggestions for the construction of online teaching evaluation mechanism and online teaching quality assurance.



Fig. 1 Online teaching evaluation mechanism model

The online teaching evaluation mechanism mainly includes two virtuous cycles of internal and external parts.^[1] External circulation refers to the process of online teaching evaluation, which promotes the circulation from data collection, data analysis to effect display. Internal circulation is the interactive process of concrete objects, including learning and goal, multiple evaluation methods combined with internal and external feedback, trinity of learning motivation, process and effect, and joint participation of evaluation subject and object. In the whole evaluation system, the internal and external circulation promote each other, combining the multi-dimensional angle with the subject, thus promoting the quality of online teaching.

2. Discussion on Online Teaching Evaluation

With the sudden outbreak of COVID-19 in 2020, HEIs have started online teaching. However, there are some problems in online teaching due to lack of experience and limitations of time and space.

2.1 The Quality of Online Teaching Evaluation

The quality of online teaching evaluation is the objective embodiment of online teaching and learning. As shown in the special survey of the Asia-Pacific Education Quality Assurance Organization (APQN), "The Impact of COVID-19 pandemic on Global Universities", online teaching is not very satisfied, with only 26.31% of teachers and students regard online teaching as effective.^[2] The main problems are the formal teaching and superficial learning.

2.1.1 Formal Teaching

Before launching online teaching, teachers are accustomed to paying more attention to students' learning status, imparting knowledge points under the traditional teaching methods and ignoring information-based teaching methods. Moreover, some teachers even move the offline curriculum online, which leads to boring content and formal teaching.

2.1.2 Superficial Learning

Committed to the student-centered principle, students are not only the object of teaching, but also the subject of learning. However, in practice, due to the space-time restriction, there is a lack of effective communication between teachers and students. Students' feedback in class is not positive, and learning efficiency is reduced, resulting in students' superficial learning. Especially in the online teaching, teachers and students have used cold electronic devices instead of enthusiastic face-to-face communication, as a result, teachers can't observe students' expressions and make eye contact with students, causing the real-time interaction and feedback lost.

2.2 The Online Teaching Evaluation Mechanism

Online teaching quality evaluation is the central link to ensure online teaching quality, and the evaluation of diversified achievements and multi-dimensional forms is conducive to the sound development of teaching. However, in online teaching practice, the evaluation results and forms tend to be homogeneous, failing to be diversified and multidimensional.

2.2.1 Simplification of Evaluation Results

Teaching achievements are the direct reflection of online teaching, but due to the space-time restriction, online teaching achievements are homogeneous and undiversified, which leads to the simplification of course assignments and the formalization of assessment contents. In the survey of

"Effectiveness of Online Teaching during the pandemic period" conducted by the Education Committee of Yunnan Democratic League, it was found that most teachers adopted the same evaluation method as used in the traditional classroom. The traditional evaluation method was "nested" in online teaching, and the evaluation contents were still about "attendance", "classroom participation" and "course papers", showing the characteristics of "following the rules". Students were not evaluated comprehensively and variously in combination with the characteristics of online teaching.

2.2.2 Homogenization of Evaluation Form

Multi-dimensional and multi-agent teaching evaluation is beneficial to the improvement and reflection of online teaching, but course evaluation tends to be superficial in online teaching for lacking assessment feedback mechanism. Different from traditional offline assessment methods, online assessment includes assessment of learning process and knowledge points.^[3] The content and operation of learning process assessment are complicated, including the progress of online courses, the attendance rate of classes, and the completion of homework. However, during the pandemic, the curriculum assessment mostly focused on the investigation of knowledge, that is, the original offline examinations turned to online examinations and papers, which ignored the achievements of students' learning process to a certain extent.

3. Exploration of Online Teaching Evaluation Mechanism

Online teaching evaluation mechanism is a virtuous circle model of internal and external interactive feedback. From data collection, data analysis and result display of online teaching evaluation, through the process evaluation, the multidimensional perspective and the main body are combined to promote the quality of online teaching.

3.1 Online Teaching Evaluation Data Collection

Online teaching evaluation data collection is the beginning of online teaching evaluation system, which mainly captures data and forms a valuable initial database through certain screening criteria. This stage consists of data acquisition and data processing, including four steps: object determination, data selection, data cleaning and data transformation.

3.1.1 Data Acquisition

Data collection refers to the data of activities related to online teaching and learning obtained by teachers through online education platform. For example, in the teaching process, online learners' resource use, learning works, self-evaluation, growth record and study reflection, etc., and online learners' resource sharing, platform utilization, interactive communication, student evaluation, etc. can all be obtained through the intermediary role of the network system. Among them, data collection mainly includes object determination and data selection (refer to Fig.2).

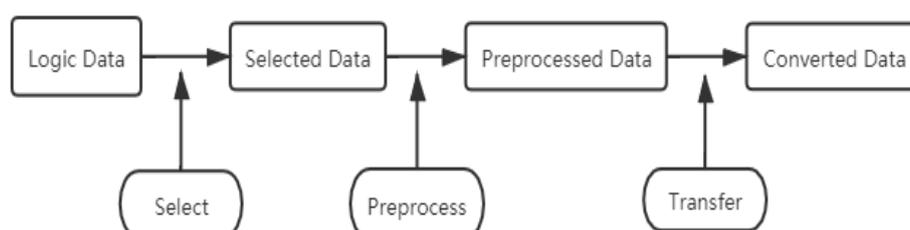


Fig. 2 General process of online teaching evaluation data collection

- (1) Object Determination. Determine the objects and characteristics of this online teaching evaluation, and formulate evaluation standards.
- (2) Data Selection. Select and collect the corresponding data according to the evaluation indexes and contents, and form a database. For example, the database of students' learning works and the database of teachers' interaction, search all the internal and external data about students' learning works and teachers' interaction. Based on this standard, the initial data suitable for mining is selected.

3.1.2 Data Processing

Data processing is based on certain screening criteria, eliminating useless data and sorting out the data on selected databases. Data processing mainly includes data preprocessing and data transformation (refer to Fig.2).

- (1) Data Preprocessing. Data preprocessing is the premise and foundation of data transformation, especially the function of data screening and filtering. Based on the evaluation indexes and rules, the junk information is filtered out and the valid data are screened out, so as to ensure the correctness of the incoming data. For example, in terms of the data processing of students' homework, we must first identify the originality of its content, the uniqueness of the style and the innovation of the results through the network, so as to avoid including a large number of plagiarized works in the analysis, thus ensuring the correctness of the database. This step can ensure the validity and reliability of the data so that the data content and format can be uniformly converted.
- (2) Data Transformation. Data transformation is about transforming the original data into a form suitable for fusion and mining, including the unification of data format and the classification of data content. The unification of data format is to unify the variable types and character widths presented by data in the database. Especially, in the setting of character space, because the original character space of each data is different, some data may not be displayed or lost when merging. Therefore, for the sake of data integrity, attention should be paid to ensuring the unity of character space. The classification of data content is based on different contents, which is reflected in the labels and values of data. Learning environment has changed from offline to online, and students' learning experience has also changed. Analyzing students' learning data can reflect and improve online teaching (as shown in Table 1).

Table 1 Content transformation of students' learning data

Classify	Evaluation content	Evaluation methodology	Evaluation purpose
Learning Attitude	Attention, emotion, will	Questionnaire, personal reflection report	Reflection on student participation
Learning Behavior	Question and answer, discussion and judgment	Evaluation questionnaire and discussion	Evaluation of interactive performance
Learning Effect	Knowledge, ability and emotion	Tests, works	Investigation of content mastery

Students' online learning data can be divided into learning attitude, learning behavior and learning method. (1) Learning attitude: it refers to the data of learners' seriousness in learning to measure the

completion of learning tasks and reflect on student participation. (2) Learning behavior data: it is mainly the operational knowledge data of learners to complete learning tasks to evaluate interactive performance. (3) Learning effect: the degree of knowledge and ability improvement of online learners after completing the course, so as to discuss the content mastery and ability improvement.

3.2 Analysis of online teaching evaluation

Data analysis is an intermediate link in online teaching evaluation mechanism, which emphasizes mining valuable information from multiple dimensions, thus providing feedback for online teaching. It mainly includes data mining and learning analysis.

3.2.1 Data Mining

Data mining is to analyze the correlation between learners' learning process, learning content, learning state and other variables by means of mathematical statistics, so as to provide feedback and guidance for teaching. According to the characteristics and purpose of mining objects, select the standard of mining analysis and analyze the transformed data (refer to Fig.3). Through data mining, we can find factors that affect students' learning and feedback in online teaching, and take measures to keep and promote students' learning enthusiasm.

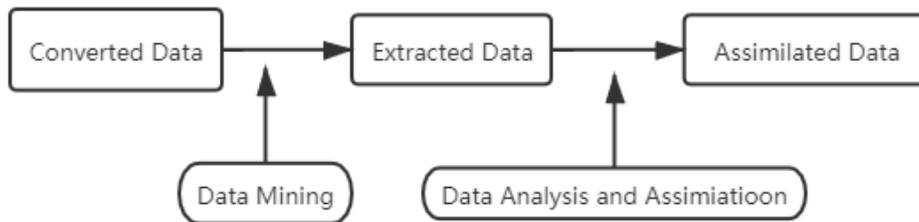


Fig.3 General process of online teaching evaluation data analysis

3.2.2 Learning Analysis

Learning analysis is a technology that measures, collects and analyzes relevant learning data in order to understand and optimize learning and its situation.^[4] According to the characteristics of teaching, online learning evaluation data analysis can be divided into three stages: before teaching, during teaching and after teaching (refer to Fig.4). Learning analysis technology can help teachers understand learners' learning situation at different stages, evaluate learners' learning effect and predict learners' development trend, thus providing timely feedback information for process evaluation.

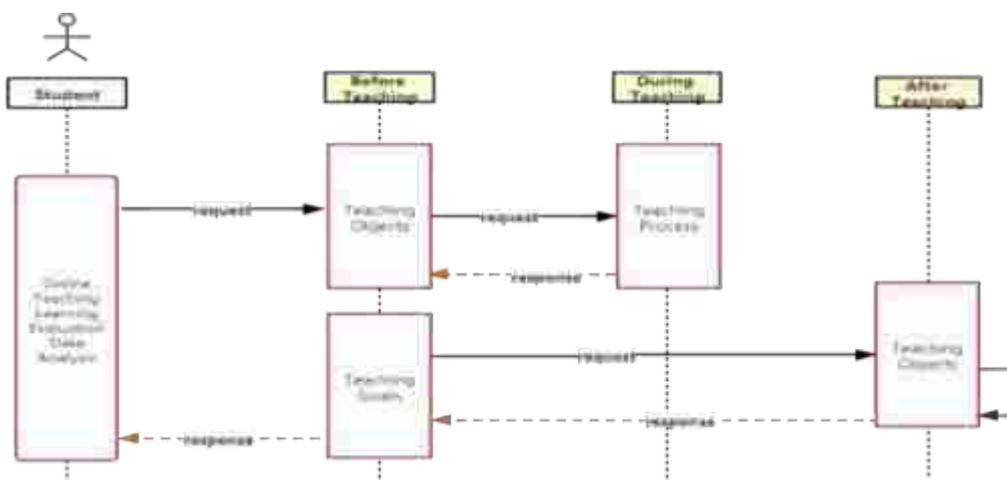


Fig. 4 Flow chart of online learning evaluation data analysis

(1) Before Teaching: Teaching Object as Prerequisite

Pre-teaching data analysis is the premise and foundation of the whole online learning analysis system, which aims to obtain the proficiency level of learners and the degree of teachers' preparation for the course content before teaching, so as to evaluate the rationality of teaching design. It mainly includes analysis of teaching object, teaching content and teaching goal. For example, the data of teaching objects include the analysis of learners' learning motivation, learning needs, learning styles and proficiency level. Teaching design based on the specific situation of teaching objects is necessary and beneficial to teaching in accordance with their aptitude.

(2) During Teaching: Teaching Process as Supplement

Data analysis in teaching focuses on teachers' teaching and students' learning. By analyzing the teaching process, it can provide supplement for online teaching improvement. On the one hand, the teaching process is guided by teachers, emphasizing the comprehensiveness of teaching content, the compliance of teaching methods and the effectiveness of teacher-student interaction. By reviewing teachers' teaching process, we can provide suggestions for effective online teaching. On the other hand, the learning process is student-centered, focusing on students' online learning content, learning results, learning initiative and self-consciousness, and homework completion. Analyze students' learning process, so as to provide their enthusiasm and consciousness of online learning, and thus improve the efficiency of online teaching.

(3) After teaching: Teaching Results for Reflection

Data analysis after teaching is mainly the presentation of teaching results, including presentation forms and presentation results. A variety of presentation forms are not only the direct embodiment of students' learning achievements, but also can promote the development of their creative thinking. Such as the display of outstanding students' learning achievements, teaching achievement awards and online excellent courses. It can not only promote students to learn from each other, but also promote the benign interaction and ideological collision between teachers and students. The teaching results is also the representation of teachers' teaching achievement, including the realization degree of expected teaching and learning achievement, the improvement of academic achievement and ability, etc. Through the achievement of these teaching objectives, teachers can reflect, adjust and improve teaching goals and methods in time.

4. Presentation of Online Teaching Evaluation Effect

Taylor believes that "continuous feedback evaluation can form a virtuous circle system between students and study, make both teaching and learning beneficial, and be closely related to future study and development".^[5] In the online teaching evaluation mechanism from data collection, data analysis to effect display, the teaching effect is based on the premise of paying equal attention to learning process and goal, emphasizing the joint participation of evaluation subject and object, the guarantee of multiple evaluation methods combined with internal and external feedback, so as to improve learning motivation, promote learning process and guarantee learning effect.

4.1 Pay Equal Attention to Learning Goal and Process

It is the premise of online teaching evaluation mechanism to insist on paying equal attention to learning process and goal. In the past, the evaluation emphasized the function of screening and selection too much, and paid no attention to individual characteristics and efforts, so the granularity of evaluation was relatively rough. Under the background of big data, the continuity and immediacy of online teaching make the process evaluation have fine-grained characteristics, which can be evaluated according to the progress of individual differences among students. In the online teaching evaluation mechanism, attention is paid to the dynamic growth of learners in the learning process, especially in the evaluation of unexpected results and the combination of goals and processes.

(1) Attach Importance to Unexpected Results

The evaluation content of unexpected results is not to test the students' final level by exams, but to aim at the progress that different individuals have made. For example, according to the horizontal comparison of learners before, during and after online teaching, including learning progress, and mastery of knowledge points, etc., we can know their learning situation and give learners real-time feedback and guidance.

(2) Combination of Objective and Process

Due to the richness of online teaching and the uncertainty of educational results, the evaluation of learning results pays more attention to the process results of students' development, emphasizes students' personal development, and focuses on the improvement of learners' dynamic thinking and ability. Through students' behavior performance and results in the learning process, students are measured from various aspects and angles. For example, we can design growth record bags, and learning file functions to record their learning process and encourage them to show their learning progress and achievements.

4.2 Joint Participation of Evaluation Subject and Object

In the online teaching evaluation mechanism, the evaluation subject and object are participants who participate and motivate together. Based on the background of online learning, through the process of mutual participation between teachers and students, the methods of mutual evaluation between teachers and students, teaching evaluation by supervision team, teaching evaluation by students and self-evaluation by students are promoted, which makes the evaluation process of online teaching more objective and comprehensive. For teachers, they can confirm students' learning methods and style, understand students' learning process and learning quality, and give appropriate encouragement to stimulate students' learning motivation. For students, they can adjust their learning objectives, plans and strategies in a timely manner, find their own shortcomings, and constantly transform the surface-based learning into deep learning methods such as cooperative learning and inquiry learning, so as to improve the effect and quality of online learning.

4.3 Multiple evaluation methods combined with internal and external feedback

The combination of internal and external evaluation methods is the significant features and guarantee of online teaching evaluation mechanism. From diagnostic evaluation before online teaching, process evaluation in online teaching, to final evaluation after online teaching, they run through the whole online teaching. Through different evaluation standards and methods, the development of online teaching is promoted to varying degrees (as shown in Table 2

Table 2 Online Teaching Evaluation Methods

Evaluation Types	Evaluation Content	Evaluation Methodology	Evaluation Purpose
Diagnostic assessment	Teaching objects, tasks and contents	Questionnaire and evaluation scale	Understand the teaching object and judge the teaching plan
Formative assessment	Teaching process and learning process	Mutual Evaluation between teachers and students, self-evaluate	Analyze the learning situation and reflect on classroom activities
Summative assessment	Teaching effect	Tests and questionnaires	Evaluate teaching objectives and satisfaction

(1) Diagnostic Assessment

Diagnostic evaluation is the pre-school diagnosis of online teaching, which is mainly evaluated from three aspects: teaching object, teaching task and teaching content. It can not only understand learners' cognitive level, learning style and interest, but also judge the rationality of teachers' curriculum preparation, curriculum design and teaching methods, thus providing a basis for teachers to understand teaching objects and improve teaching plans.

(1) Formative Assessment

Formative evaluation is the intermediary bridge of online teaching, which plays a leading and guiding role in both teaching and learning process. On the one hand, according to the personalized features in the database, analyze the learners' learning situation and course performance in the learning process, and provide timely feedback and guidance. On the other hand, we can review the content presentation, teacher-student interaction, teaching methods and other aspects in the teaching process, and make corresponding adjustments according to the students' learning situation, so as to improve the online teaching effect.

(2) Summative Assessment

The summative evaluation is the direct embodiment of the online teaching effect, which not only reflects the learning achievements, but also the teaching results. Through rich and varied presentation methods, students' enthusiasm can be aroused, and at the same time, their practical ability can be cultivated. The presentation of teachers' teaching results mainly includes the realization of online teaching expectations and learning achievements, grades and pass rate, and the promotion of students' ability to solve problems and develop themselves. The first two items belong to explicit goals, which can be roughly known through students' classroom performance and homework completion, but the latter item belongs to implicit goals and needs to be known through process evaluation. Therefore, the presentation of online teaching results is based on teachers and students, covering knowledge, process and ability.

4.4 Trinity of Learning Process, Motivation and Effect

The trinity of learning motivation, learning process and learning effect is inexhaustible motive impetus of online teaching mechanism, which runs through the whole online learning. It takes the development of learners as the fundamental starting point, pays attention to the scientific and humanistic nature of learning evaluation, and organically combines the learning process with the evaluation process, thus stimulating their learning motivation, promoting the learning process and improving the learning effect.

(1) Stimulate the Learning Motivation

Learning motivation is the intrinsic motivation to promote learners' learning. Based on learners' needs, online teaching conducts pre-school diagnosis on their existing knowledge level and learning style, and pushes the content that conforms to learners' cognitive level to stimulate their interest in learning. At the same time, in the process of learning, knowing the position of learners and the gap with the expected goal, and giving real-time feedback and guidance can stimulate and maintain learners' learning motivation to a certain extent.

(2) Promote the Learning Process

Learning process is concerned with the dynamic development process of learners in online learning. Maintaining and stimulating learners' learning motivation can promote their learning process. According to the results of data collection and analysis, students' learning situation can be reflected in time, and appropriate learning methods can be adjusted and applied.

(3) Improve the Learning Effect

Both learning motivation and learning process play a key role in learning effect. In the online teaching mechanism, real-time feedback can maintain and stimulate learners' learning motivation, so that they can keep their enthusiasm in learning. The adjustment and application in the learning process can also promote the improvement of learning efficiency, thus improving the effect of online learning.

5. Conclusion

With the advent of the post-pandemic era, online teaching will become a normal teaching mode, and online education in HEIs has ushered in a rare opportunity for development. As an important part of online teaching, online teaching evaluation mechanism can not only promote students' learning process, but also improve teachers' teaching process. Online teaching evaluation mechanism mainly consists of three major components: online teaching evaluation data collection, online teaching evaluation data analysis and online teaching evaluation effect presentation. First of all, online teaching evaluation data collection is the beginning, which mainly collects and screens the target data through certain screening criteria, and converts the data into the same format or content. Secondly, the analysis of online teaching evaluation data is an intermediate link. Through data mining, such as analyzing the relationship between learners' learning process, learning content, learning state and other variables, it can provide support and guidance for each stage of online teaching. Finally, the demonstration of online teaching evaluation effect is based on the premise of paying equal attention to learning process and goal, emphasizing the joint participation of evaluation subject and object, the guarantee of multiple evaluation methods combined with internal and external, so as to stimulate learning motivation, promote learning process and guarantee learning effect. In this way, online teaching evaluation forms a virtuous circle, which is based on data collection, relies on data analysis and takes effect display as feedback, in which promotes each other to guarantee and improve the quality of online teaching.

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Impact of COVID-19 on the Technical and Vocational Institutes (A Case Study of Pakistan TVET Institutes)

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Abstract

After the global financial crisis of 2008, the COVID-19 is a pandemic disease that hardly affected global public health, and in Educational, Economical, business etc. On February 26, 2020, in Pakistan special Assistant of Prime Minister Imran Khan, confirmed 2 cases of COVID-19 were diagnosed, both Patients came from the visit of Iran, both patients belonged to Sindh, Pakistan. Due to COVID-19, all the sectors are running abnormally, especially the educational sector. Globally all the countries announced lockdowns and ordered to closed the entire educational sector to prevent COVID-19, This research investigates the major challenges faced by TVET institutes of Pakistan during the crises of COVID-19 and Conducted a comparative analysis on TVET institutes of Pakistan during the COVID-19 crises. The data collected from the various reports of COVID-19 prepared by national and international agencies, regarding comparative analysis information collected from the national website of the (National vocational and technical training commission (NAVTTTC) of Pakistan and the Provincial websites of TVET authorities of (Punjab, Sindh, Balochistan, and Khyber Pakhtunkhwa) on the Impact of COVID-19 crises on TVET institutes of Pakistan, Finally Conclusion and recommendations were provided to overcome the COVID-19 crises on TVET sector of Pakistan

Keywords: TVET, COVID-19, Pakistan

1. Introduction

After the global financial crisis of 2008, the COVID-19 is a pandemic disease that hardly affected global public health, also in every sector such as Educational, Economical, business etc. The WHO officially named as the COVID-19 on 11 February 2020 the abbreviation is that “co” stands for Corona and “vi” means Virus, D means disease and the 19 showed the Year in which the virus emerged (31 December 2019) the first case of COVID-19 outbreaks in the Wuhan city, China. During the five days close to 70000 infected cases were reported and 1800 people were killed. On February 26, 2020, in Pakistan special Assistant of Prime Minister Imran Khan, confirmed 2 cases of COVID-19 were diagnosed, both Patients came from the visit of Iran, both patients belonged to Sindh, Pakistan, one from Karachi and 2nd from the interior of Sindh. Due to COVID-19, all the sectors are running abnormally, especially the educational sector. Globally all the countries announced lockdowns and ordered to closed the entire educational sector to prevent COVID-19, The UNESCO reported that during April 2020 from the total world population 90% of students were infected by COVID-19, more than 120 crores of students and Youths were infected in this planet. After a few months WHO advised the entire world to maintain distance is a major step to the prevention, therefore

countries of the world announced lockdowns and suspended the classes and physical activities of Schools, Colleges, and universities and postponed exams and internships of students and the Higher Education Commission ordered that shift all the activities online through the (Zoom app, Ms. Teams, Google classroom, Skype, etc.) also made WhatsApp groups of students, Parents, guardians for better communication) which is successful in developed countries but like in Pakistan, there are many challenges faced because (PTA, 2019) reported that only 36.86% of the population of Pakistan have access of Internet. In Pakistan, two main streams are running in the education system i.e. formal and non-formal education systems. Technical and vocational education (TVE) is counted as the major branch of the professional education system. General education is identified as a key of any development strategy, and Technical & Vocational education is identified as a master plan to enhance the economic growth of all the developed & developing nations and improve the well-being of life. Unfortunately, COVID-19 immediately affects the Technical and Vocational education Training institutes of Pakistan as well as the World. According to the report of UNESCO, 2020, the majority of responses showed that 90% of TVET institutes are completely closed in 114 countries by the effects of COVID-19, but in some of the regions Responses about the partially closed in Asia, Europe, and central Asia. Including Pakistan. Due to the closure of Technical Institutes, trainers faced challenges in the provision of practical skills training, so they made video lectures and conferences about the skills training but due to unavailability of internet and machines at home it was very difficult to students they learn effectively. Therefore, dropout ratio of students increased and the remaining students feel demotivated and report showed that due to lack of accessibility of the internet and equipment's poor students were not facilitated by the Online System. Another challenge for TVET centers is that due to lockdowns all the local markets and Industries closed; therefore, a lot of students have fewer chances to learn from on-the-job training (OJT). In Pakistan TVET institute's performance are not satisfactory due to having fewer facilities of Internet, Resources, and connectivity, and Technical and vocational education is based on Hands-on skills which are effectively possible in the laboratories and workplace, platforms, etc. For that reason, they faced disruptions and difficulties during the online and remote learning system. Therefore, this research paper highlights the major challenges faced by TVET institutes of Pakistan during the crises of COVID-19, the major aspect of this research is conducted a comparative analysis of TVET institutes in Pakistan from the Provisional Websites of TVET Authorities of each province to know the performance of each provincial authority of TVET and at the end, this study has suggested recommendations for better outcomes in future.

2. Literature Review

The use of technical education term is mostly in a wide range of education, globally, the technical education use as an alternate of Technical and vocational education training TVET (UNESCO, 2010) Technical education aims to enhance the skills of youth in different fields which are required in industrial sectors, and the technical education is different from academic education. Academic education develops the minds of students to soft and intellectual skills, technical education based on practical or physical learning (Ali et al., 2017) all the Technical and general educational sector effected by COVID-19, globally it proved that there is no any single country who fully innovative and equipped in ways of online learning, due to temporary closure of Educational centers there were 1.7 billion students or learners were effected by COVID-19 and lot of TVET institutes of Pakistan faced many obstacles and challenges in online system because of limited resources in TVET centers, also other reason is Pakistan counted as a developing country which focused more in general education as compare to Technical Education therefore it created Digital gap, thus students feel

demotivated due to less digital facilities and opportunities (Noor, *et al.*, 2020) Pakistan government forced TVET institutes to start online learning approaches in the centers because of prevention from COVID-19, the Remote learning is totally new for TVET institutes as well as for students, therefore in the starting time they faced many issues in online classes because the Technical education is based on the practical training. Finally, to these reasons the government of Pakistan decided to promote students without assessments and exams in 2020 (ILO, report 2020) some private and government centers remain open but due to closure of markets and borders has affected for required Practical training materials. TVET trainers faced difficulties in the delivery of practical based courses such as in Electricians, Plumbing, Civil Engineering, etc. (Hayashi, *et al.*, 2021) the report of ILO-UNESCO, 2020 stated that due to the crisis of COVID-19 all the Practical based learning and On the Job Training (OJT) are completely stopped, therefore students only completed 60% their courses in an online system.

Furthermore below discussed table 01 indicated that in Pakistan there are 3,581 public and private TVET institutes currently working in different provinces in which 934 are technical institutes, and the vocational institutes are 2647. In Punjab 1817 institutes (662-Technical and 1155-Vocational) are working which means the large numbers of institutions are working in Punjab close to 51% of total institutions, 599 (17%) institutions (30-Technical and Vocational-569) in Khyber Pakhtunkhwa and in Sindh 589=16% of total institutions (186-Technical and Vocational-403) in Baluchistan 123 (08-Technical and Vocational-115) institution are working and other institutions are discussed in the table .

Province	Technical	Vocational	Total
Pakistan	934	2647	3581
Punjab	662	1155	1817
Sindh	186	403	589
Khyber Pakhtunkhwa	30	569	599
Baluchistan	8	115	123
GB	8	167	175
AJK	12	102	114
ICT	19	84	103
FATA	9	52	61

Table 1 Provincial Distribution of TVET institutes

3. Problem Statement

The COVID-19 is a pandemic disease that hardly affected globally in every sector, especially in public health, Education and business etc, Thus, this research paper highlights the major challenges faced by TVET Institutes of Pakistan and also identify the performance of TVET Institutes during the Crises of COVID-19.

Research Objectives

1. To highlight the major challenges faced by TVET institutes of Pakistan in the crises of COVID-19
2. Conduct a comparative analysis of TVET institutes of Pakistan in the COVID-19

4. Research Methodology

In this research study data has been presented and collected from the various reports of COVID-19 which prepared by national and international agencies, remaining collected data from the national website of the (National vocational and technical training commission (NAVTTTC) Pakistan, and the Provincial websites of TVET authorities of (Punjab, Sindh, Balochistan, and Khyber Pakhtunkhwa, and also from related reports of UNESCO- ILO and Articles, E-Contents of the Impact of COVID-19 crises on TVET institutes of Pakistan.

5. Data Analysis and Results

5.1 Major Challenges Faced by TVET institutes of Pakistan in COVID-19

The TVET institutes of Pakistan hardly suffered due the cries of COVID-19, therefore many different challenges and obstacles faced TVET centers in Pakistan, some of the challenges were discussed below.

(1) Hampered TVET institutes activities:

Due to COVID-19 crises and lockdown all level of classes and other physical activities were suspended and Exams and assessments of technical courses and trainings postponed. All the TVET activities delayed such as new admissions and entrance test, results, exams etc. students faced loss of three months in academic year of 20-2021, and also as student faced difficulties in online classes as well as they will facing difficulties in rejoin after huge gap of physical Activities.

(2) Impact of COVID-19 on employment:

During the crises of COVID-19 all the Recruitment agencies and companies postponed their recruitment process also delayed internship opportunities in industries. Placement of TVET graduates in industries effected due to delaying the recruitment process. The unemployment rate of Pakistan increased at the time of outbreak of COVID-19 because all the recruitment process of private and Government were stopped. Also, lot of Bank jobholders leaves their jobs and some of private organizations fired their employees due to lockdowns.

(3) Online/Distance Learning

At the time of pandemic, Pakistan government announced the lockdown and ordered to closure for all the educational Centers and shifted to distance learning, TVET centers faced lot of issues regarding the delivery of lectures online. Such as due to sudden announcement of lockdowns they have limited digital tools, equipment and Training resources, some online learning challenges listed below.

- Lack of effective online system
- Quality oriented online platforms
- Challenge for Students and trainers to conducted online Physical trainings
- Lack of planning and trainings
- Lack of digital skills in TVET teachers

(4) Lack of preparation in online Learning:

At the time of sudden cries of COVID-19 not all the Students and teachers were ready to shifted face to face class into online learning, some of teachers argued about the lack of planning and facilities we were not able to conducted classes online and the remaining teachers of Millennium generation were conducted sessions and classes through the (Zoom app and Google class rooms etc.) without dedicated Platforms of online learning it may not be effective learning, because of

engagement of students possible in video lectures also students of rural areas faced lot of voice and connectivity issues etc. during the online classes.

(5) Global opportunities of Employment reduced

Due to the Traveling restrictions of peoples in COVID-19 lot of employees lose their employments from the other countries, remaining TVET graduates were not able to go in other countries regarding jobs. Many Pakistani peoples come back from other countries due the pandemic and some students already got jobs, Internships, Scholarships etc. but faced difficulties in joining. The recent Pakistani TVET graduates also fearing about the career because from 2020 continuously again and again government announced lockdowns in country and from 2 years recruitment process were stopped, no any government test and interviews were conducted, and some of candidates waiting for results and remaining were qualified their screening and written tests but due to lockdowns their interviews are not scheduled.

5. 2 Comparative analysis of TVET Sector of Pakistan in COVID-19

Due to COVID-19 crises the TVET centers were hardly affected because the Technical and vocational education totally based on practical learning, therefore in this research major concern to do a comparative analysis between Provincial TVET centers of Pakistan during the crises of COVID-19.

(1) Closure of TVET centers

Due to sudden announcement by Government of Pakistan, majority of the TVET centers closed, results are that, in Punjab 90% centers were closed only 10% centers were opened with limited staff, and in Sindh TVETA centers totally closed, 95% TVET institutes were closed in Khyber Pakhtunkhwa and 92% were closed in Balouchistan 8% centers of were performed their duties with limited staff with SOPs, furthermore Percentage of closure of each province TVET centers are discussed below in graph

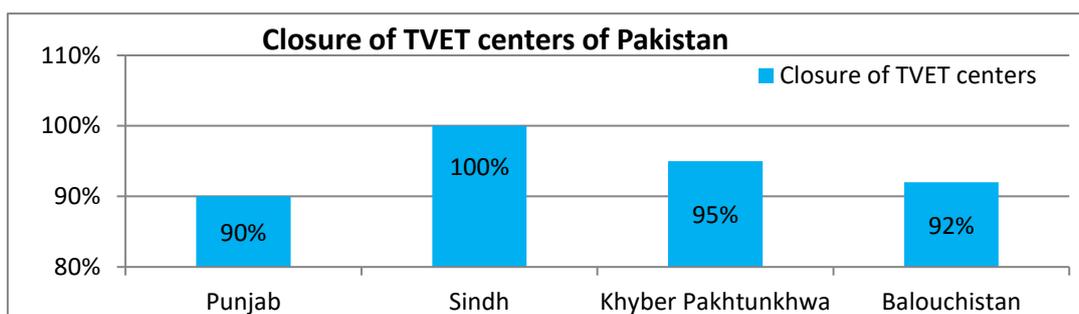


Figure 1. Closure of TVET centers

(2) Shifted to Remote learning

Due to lockdown TVET centers of difference provinces were closed, therefore government announced to shifted educational institutes into online learning, due to sudden impact of COVID-19 therefore due to limited facilities and lockdowns fewer TVET centers were shifted their education online, such as 60% TVET centers of Punjab and 30% TVET institutes in Sindh, and 45% institutes of Khyber Pakhtunkhwa, 25% institutes of Balouchistan were shifted in Remote Learning.

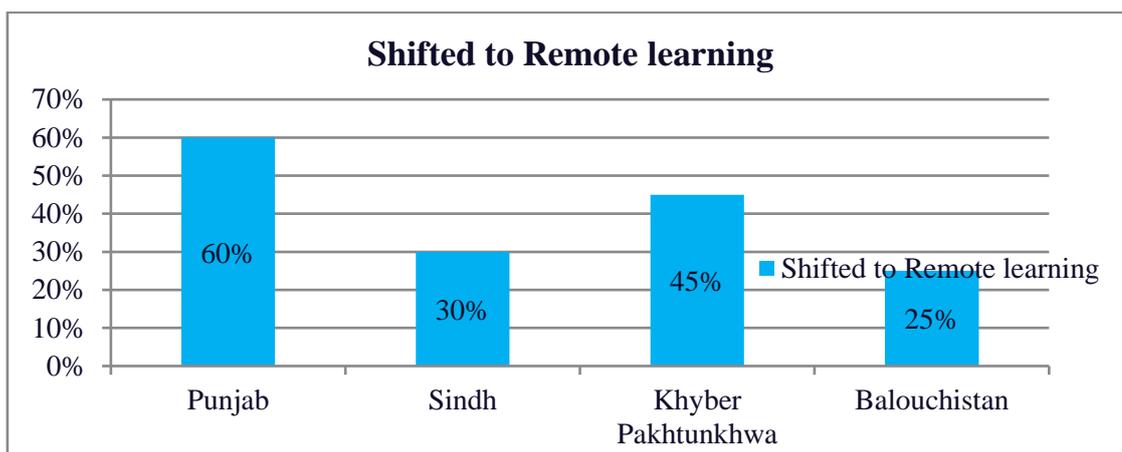


Figure 2. Shifted to remote learning

(3) Facilities of Internet/ Connectivity Resources in TVET Centers

The facilities of internet is most major element which help to shift the remote learning, so the below figure shown the data of Internet facilities in TVET centers of different Province. In Punjab province there is 99% availability of internet facilities in technical and vocational institutes, 32% in Sindh and 78% facility of internet available in Khyber pakhtunkhwa and 25% internet facilities available in TVET institutes of Balouchistan. Thus, in Sindh and Balouchistan very low facilities of Internet in TVET centers so they faced lot of issues to shifted their activities into Remote learning.

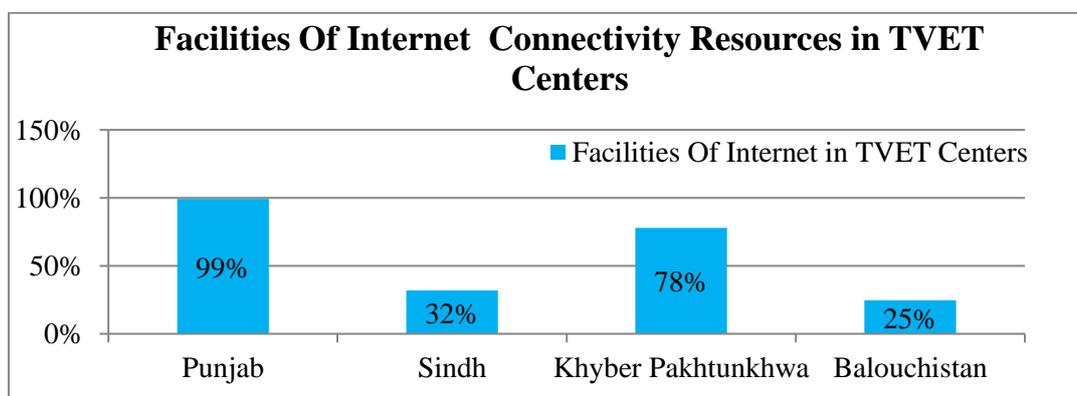


Figure 3. Facilities of Internet/ Connectivity resources

(4) Backup source of electricity

During the crises of COVID-19 TVET sectors shifted online system but due to load shading lectures were disrupted therefore they must have backup source of electricity for remote learning, below graph represented data that, in Punjab they have 72% backup plan of electricity (UPS, Generator, Solar, etc.), 17% in Sindh TVET sectors and 21% backup plan of electricity in Khyber Pakhtunkhwa, Balouchistan have 23% backup plan of electricity.

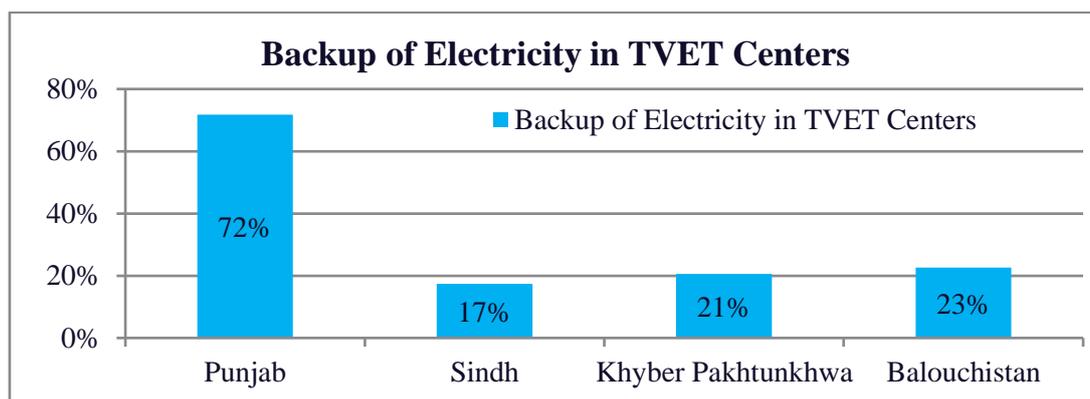


Figure 4. Backup of Electricity in TVET Centers

(5) Lack of Motivation of Teachers and Students in COVID-19

TVET programs and trainings are based on practical activities which must be performed through the laboratories and workplace, Workshops etc. due to all the activities of TVET centers shifted into remote learning so trainers and teachers faced lot of difficulties in engagement of students and also delivering practical trainings online through Videoconferences, Zoom app, MS Teams etc. students also demotivated because they couldn't understand lectures effectively without practically use of equipment's therefore students and teachers feel demotivated during the classes. According to the report of UNESCO-2020 After adopted remote learning in Pakistan TVET centers, Teachers faced stress and work overload in online teaching methodologies and students demotivated because of connectivity and electricity/Network issues in rural areas.

(6) Disruption in the delivery of apprenticeships

During the time of crises of COVID-19 lockdowns imposed in overall Pakistan all the local industries and enterprises closed, for those reasons all practical trainings such as on the job Training (OJT) and Apprenticeships, work placements were disrupted such as some practical modules were cancelled and some training schedules were postponed in Pakistan. In Karachi, Sindh, TVET some organizations remained opened so apprentices' activities performed as part time in workplace.

6. Discussion of Findings

The finding of first objective of study referred that lot of obstacles and issue faced TVET centers of Pakistan in the crises of COVID-19, at that sudden announcement of lockdowns all the activities shifted into remote learning therefore due to fewer facilities and lack of trained staff, connectivity issues it's not possible as effective. The second objective of this study revealed comparative analysis of TVET centers of different provinces of Pakistan such as (Punjab, Sindh, Khyber PakhtunKhwa and Balouchistan) in during the crises of COVID-19 the findings shown in above graphs that all the provinces affected hardly at the time of COVID-19 especially Sindh and Balouchistan. In order to the results of graphs the performance of Punjab was best, and performance of Khyber Pakhtunkhwa were satisfactory but the performance of Balouchistan and Sindh were not satisfactory at the time of COVID-19 crises

7. Conclusion and Recommendation

This research study concluded that TVET institutes playing vital role in the growth and development of youth of Pakistan, At the time of COVID-19 all sectors hardly affected. thus, Government of

Pakistan needs to developed different strategies, SOPs and provide different facilities and platforms for remote learning to face the COVID-19 crises, also TVET stakeholders and enterprises can work together during and after the crises of COVID-19 which reduce the impact of crises on education.

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Impact of COVID-19 Pandemic on Higher Education Sector in Russia: Example of Minin University

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Abstract

The impact of the COVID-19 pandemic on the education sector is enormous. If earlier a face-to-face type of teaching-learning process was the predominant one, now it is replaced by distant education, which is followed by the use of different online platforms and learning management systems. A successful transition to distant learning requires a lot of efforts from the part of institutions, especially the development of special IT infrastructure and preparing teaching staff to new forms of conducting education process. Overall, the learning process becomes more student-oriented and is based on the principles of self-determined learning, meaning that students are responsible for their educative pathways.

The study considers the influence of the pandemic on academic performance at Minin University. Being prepared for distant education, the University didn't face a lot of difficulties in transitioning to distant learning and successfully adapted to the pandemic repercussions due to well-developed IT infrastructure and experienced teaching staff. These factors had a positive impact on academic performance during the pandemic.

1. Introduction

The COVID-19 pandemic had a widespread impact on human life and affected all sectors in society, including economy, health system and education. In order to prevent rapid proliferation of COVID-19 and decrease its fatality, the governments of both developed and developing countries were forced to put some special measures in place, such as lockdowns, staying home strategies, social distancing and obligatory wearing of face masks while being in public (Pokhrel and Chhetri, 2021). In some countries such measures have lasted for a long time; in others – a little bit shorter due to prompt vaccination. However, it comes without saying that our life has changed a lot, and there is no certainty that it would get back to habitual routine.

Nevertheless, the pandemic boosted a huge trend in global education, which dramatically changes the way the education systems perform. This trend implies the transition from face-to-face (F2F) modes of teaching-learning process to digital or so-called “distant” learning, followed by the use of various online platforms and learning management systems. According to Ashour et al. (2021), the main feature of distant mode of learning lies in its flexibility in terms of time and place. Students choose by themselves when and where to study, so they are able to do it in their own rhythm and schedule. Moreover, it entails the application of an individual approach to learning process, which requires strong intention to self-education from students on the one hand, and capacity for creating

individual educative pathways for learners from teachers, on the other hand. Proceeding from this, distant learning is more focused on the principles of heutagogy, which was firstly introduced by Hase and Canyon in 2000, rather than on the traditional forms of teaching-learning process based on the principles of pedagogy and andragogy. In other words, education becomes more individualized and learner-centered than it was earlier (Blashke et al. 2014; Sedykh and Kutanov, 2021).

Undoubtedly, distant learning is the main response to the pandemic's repercussions in education sector, and almost every institution tends to deploy this instrument in its practice. However, there are some challenges related to prompt transition from F2F learning to distant mode of education. Firstly, being in strong dependency on the delivery of knowledge in person, education systems all over the world were totally unprepared for such a sudden shift and faced a lot of difficulties in overcoming the obstacles caused by lockdowns and social distancing. Although developed countries with rich IT infrastructure could successfully adapt to new reality by implementing online modes of learning, many of developing ones couldn't provide all learners with an access to decent education due to lack of financial resources and technical support (Refaat El Said, 2021). In this regard, the pandemic reinforced the existing inequality in education sector by provoking "digital inequality", which can be characterized by uneven affordability and accessibility of necessary technologies for education to all students (Rashid and Yadav, 2020). From this perspective, distant learning may be inefficient or even impossible without creating special infrastructure, which would allow all students to afford themselves necessary devices and to have an access to the internet and, consequently, to the digital learning process.

Secondly, distant learning requires particular skills from the part of teaching staff in conducting learning process in the most efficient way and in maintaining students' motivation in studying. Of course, there is no one-size-fits-all methodology, which would be useful for every educator due to a huge variety of subjects with special needs (Pokhrel and Chhetri, 2021). By the way, there are some universal interpersonal skills that should be well-developed. For example, a teacher has to know how to work, using different kinds of software (Zoom, Excel, Google forms, etc.), and he/she has to teach students the principles of self-determined learning, making them responsible for their individual learning pathways. It actually means, that in a distant learning model teachers are considered as mentors for their students; and they also have to develop their digital literacy.

Finally, in the vast majority of cases the transition from F2F learning to distant one was followed only by digitalization of teaching-learning process without adequate adaptation of traditional assessment systems to new formats of studying. As it becomes more difficult to control cheating and academic dishonesty, elaboration and implementation of an alternative system of assessment seems to be required.

This study investigates the experience of the Minin Nizhny Novgorod State Pedagogical University (Minin University) in facing the challenges, which were provoked by required transition to distant learning. In particular, the study assesses the change in students' academic performance from 2019 – the year before the pandemic, to 2020 – the year, when distant learning was introduced into the Minin University's practice. The paper starts with an overall observation of the measures against pandemic in the Russian education sector. Then, it is followed by the data on students' academic performance at Minin University during the selected period. Finally, the conclusion and some insights of the research are presented.

2. Impact of COVID-19 pandemic on academic performance at Minin University

2.1. Russian higher education sector during the pandemic

In the end of March 2020, the Russian government announced the lockdown for one week, meaning that all people had to stay at home despite their work or study occupancy. The workplaces that could organize their operation in a distant mode were allowed to continue functioning. All others had to stop operating until the end of the lockdown. A week later it became clear, that the restrictive measures would be prolonged, so many organizations started to deploy distant modes of working.

Comparing with other sectors, the sector of higher education was prepared for such transition due to existing IT infrastructure in the vast majority of the Russian Universities. The reason for this is to be found in the Federal law on education of 2012, according to which all institutions of higher education had to implement and develop distant modes of learning in their practice. Consequently, by the start of the lockdown many instruments of distant learning had been already in use. That's why almost 95% of the Russian Universities could afford themselves the transition to distant education (Klyachko and Sinelnikov-Murylev, 2020).

The Minin University was not an exception. Since 2014 the learning management system of the Minin University (LMS) had been steadily elaborated; and by 2019 almost 80% of disciplines had received their analogues in distant mode. Having its own LMS, which provided students with an access to all necessary materials including lectures and online library, the Minin University could easily adapt to the lockdown and translate F2F mode of education into the distant learning process. Moreover, the teaching staff of the Minin University had enough experience in online teaching, so the learning process was not disrupted by the lockdown's implications at all.

In the end of April 2020, when the lockdown in Russia was over, the Minin University students were allowed to choose, which mode of learning, whether F2F or distant one, they would like to continue. The results were controversial. Despite the fact, that the overwhelming majority of students (83%) pointed out the lack of interaction between teachers and students in distant mode of learning, 44% of studying groups decided to continue education in a distant form. It actually means, that the benefits of distant learning outweigh its disadvantages for almost the half of the respondents. Nevertheless, the majority of students still prefer a traditional F2F education.

2.2. Academic performance at Minin University during the pandemic.

There are 6 faculties at the Minin University and each faculty has different number of groups that practice distant learning. For example, 37 groups out of 70 in the Faculty of Arts are in a distant mode of education, whereas in the Faculty of Design all 16 groups continue F2F type of learning. Such a significant division can be explained by two reasons. First of all, some faculties, like the Faculty of Design or the Faculty of Sports, have special educative programs, which require the use of particular equipment. Secondly, these faculties do not possess a large number of students, so they are able to follow the rule of social distancing.

For the purposes of research, all the faculties were decided to be clustered by 3 groups, depending on their engagement in distant learning process. Thus, the first cluster includes the F2F learning-oriented faculties. The second cluster consists of faculties, in which both types of education process

are equally in use. Finally, the third cluster comprised the distant learning-oriented faculties. The more precise information on faculties' engagement in distant learning is shown in the Table 1.

Cluster	Faculty	Overall № of groups	№ of groups on F2F learning	№ of groups on distant learning
1 (F2F learning-oriented)	Faculty of Design	16	16	0
	Faculty of Sports	14	14	0
	Faculty of Management	35	23	12
2 (Mixed learning)	Faculty of Arts	70	33	37
	Faculty of Science	45	24	21
3 (Distant learning-oriented)	Faculty of Psychology and Pedagogy	31	9	22

Table 1. The Minin University's faculties engagement in distant learning

In order to assess the impact of the pandemic on academic performance at Minin University, the authors used quantitative analysis of the average faculty's grades in 2019 and 2020. The classification of faculties on clusters and further comparison of the average grades between clusters provide us with an extensive information on the real influence of distant learning on academic performance at the University

Cluster	Faculty	Average grade in 2019	Average grade in 2020	Change in %
1 (F2F learning-oriented)	Faculty of Design	4,3	4,6	+6,5
	Faculty of Sports	4,1	4,1	0
	Faculty of Management	3,8	4,1	+7,5
2 (Mixed learning)	Faculty of Arts	4,2	4,2	0
	Faculty of Science	4,1	4,2	+2,5
3 (Distant learning-oriented)	Faculty of Psychology and Pedagogy	4	4,5	+11

Table 2. The change in academic performance by faculty from 2019 to 2020

According to the Table 2, the pandemic didn't have any harmful effect on academic performance at Minin University. In opposite, the average grades by faculty in 2020 had increased or stayed at the same level as in 2019. Moreover, the best academic performance was fixed in the distant learning-oriented cluster with a noticeable growth by 11 per cent. Judging by these results, distant learning was more profitable than F2F one in terms of students' performance outcomes.

Despite the evident success of Minin University in maintaining academic performance during the pandemic, the results of the research, especially the results related to the 3rd cluster, may be considered as ambiguous. On the one hand, there is no doubt that the existence of the experienced teaching staff and well-developed IT infrastructure facilitates the transition to distant learning and

makes it at a high-quality level. On the other hand, the indicators of the 3rd cluster do not necessarily mean, that distant learning would be always followed by the increase in academic performance. There are several factors that influenced on the results of the Faculty of Psychology and Pedagogy. Traditionally, the staff of this faculty was engaged in elaboration of new methods of teaching-learning process and in development of LMS. That's why, the teachers of this faculty were more experienced in distant modes of learning than their colleagues and had more knowledge and skills in conducting self-determined learning. In this regard, the outcomes of academic performance do not depend on the transition to distant learning itself, but on the capacity of the University to provide students with decent teachers, access to necessary materials and technologies.

3. Conclusion

The COVID-19 pandemic had a huge influence on education sector, making all institutions to deploy distant mode of learning in order to decrease the proliferation of COVID-19. For some institutions such a prompt transition was impossible, for others – smooth and beneficial. The reason for this is to be found in distinctions in development of IT infrastructure between different organizations. The institutions that had already developed some instruments of distant education could easily adapt to new reality, despite all challenges of distant learning.

The aim of the research was to examine the impact of prompt transition from F2F mode of learning to distant one on the academic performance at Minin University. The results of the research approved the hypothesis that such transition is not necessarily followed by the decrease in average grades. Moreover, the results have shown that in some cases the transition to distant learning may boost a significant growth in academic performance. This can be explained by the readiness of institution for distant learning in terms of possession of well-developed IT infrastructure and experienced teaching staff.

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Improving the Recognition Climate for TNE Qualifications through Cross-Border Cooperation

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Abstract

Over the past 20 years the international education community has seen significant growth in transnational education (TNE), that is education delivered in a country other than the country in which the awarding institution is based. This growth has occurred across the board, involving the number of providers involved in TNE, the number of students studying on TNE programs, the number of countries involved in TNE delivery either as sending or receiving country, as well as the different models and types of TNE operations.

The increasingly strategic importance of TNE is also reflected in the fact that its growth now appears as an explicit target in the internationalization strategies of education providers and ministries of education in both sending and receiving countries. And we can expect TNE to continue to grow in strategic importance post-COVID-19, as providers are appreciating the role that TNE operations and international partnerships can play in meeting the education and training needs of students unable or unwilling to travel internationally or long distances.

However, despite its growth and its increasing strategic importance worldwide, there are still important challenges and hurdles to the recognition of TNE as an acceptable mode of earning a qualification, which prevent TNE from fully realizing its progressive potential as a more flexible, inclusive and sustainable form of internationalization. These challenges relate to a lack of trust towards qualifications obtained through TNE operations whose nature and quality might be difficult to understand and assess for international regulators and credential evaluators, especially in the absence of an international framework for the quality assurance and recognition of TNE qualifications.

A number of international initiatives and guidelines have over the years emerged to inform cooperation and the development of a shared understanding in this area, such as the regional qualifications recognition conventions, and the recently signed UNESCO Global Recognition Convention. However, the implementation of these initiatives and guidelines varies greatly depending on national interpretations and broader national regulatory frameworks and policy directives.

This paper outlines a new international initiative aimed at offering that missing global solution capable of transcending and bridging the different existing national approaches for the quality assurance and recognition of TNE qualifications. This is the TNE Quality Benchmark (TNE QB) scheme developed by Ecctis - the agency that has managed on behalf of the UK government the qualifications recognition service (UK ENIC, formerly UK NARIC) since 1997 - with a view to helping improving the recognition climate for TNE qualifications of demonstrated quality and standards

The paper introduces this initiative and explains how it can help overcoming the global quality assurance and recognition challenge for TNE by building on four international dimensions: international scope (applying to any TNE provision, regardless of country of origin or delivery); international standards (drawing on existing international reference points, such as those outlined above); international peer-review (relying on peer-assessment from both sending and receiving countries, as well as on the oversight of an international independent advisory board); and international cooperation (cutting across the quality assurance qualification recognition communities from both sending and receiving countries).

1. Introduction

Over the past 20 years the international education community has seen significant growth in transnational education (TNE), that is education delivered in a country other than the country in which the awarding institution is based. This growth has occurred across the board, involving the number of providers involved in TNE, the number of students studying on TNE Programs, the number of countries involved in TNE delivery either as sending or receiving country, as well as the different models and types of TNE operations.

The increasingly strategic importance of TNE is also reflected in the fact that its growth now appears as an explicit target in the internationalisation strategies of education providers and ministries of education in both sending and receiving countries. And we can expect TNE to continue to grow in strategic importance post-COVID-19, as providers are appreciating the role that TNE operations and international partnerships can play in meeting the education and training needs of students unable or unwilling to travel internationally or long distances.

Over the past year, education providers have already been able to leverage their existing TNE operations to allow students unable to travel to have a campus experience using their TNE outposts. And an increasing number of education providers have also started developing international partnerships with the same goal of allowing international students to continue or start their international studies through in-person study or being able to make use of on campus facilities and support whilst waiting to be able to travel the home campus of their awarding body.

This growth is not surprising. On the one hand it is a reflection of deepening dynamics of globalisation in every sector of society. On the other hand, it is due to the benefits associated with TNE for both sending and receiving countries. For sending countries it can be a way to diversify their routes to international student recruitment, as well as being a way to develop virtuous international relationships which can translate in reputational advantage and soft power. For receiving countries, it can be a way to facilitate transfer of knowledge and local capacity building, contribute to internationalise the local education sector, including by developing international education hubs, as well as helping to address unmet demands for education and training. Indeed, TNE can play an important role in widening access to quality and international education and thus contribute in making progress towards the United Nations Sustainable Development Goal 4 of ensuring ‘inclusive and equitable quality education and promote lifelong learning opportunities for all’ (United Nations, 2015).

However, despite its growth and its increasing strategic importance worldwide, there are still important challenges and hurdles to the recognition of TNE as an acceptable mode of earning a qualification, which prevent TNE from fully realising its progressive potential. These challenges relate to a lack of trust towards qualifications obtained through TNE operations whose nature and quality might be difficult to understand and assess for international regulators and credential evaluators. Especially in the absence of an international framework for the quality assurance and recognition of TNE qualifications.

A number of international initiatives and guidelines have over the years emerged to inform cooperation and the development of a shared understanding in this area, such as the regional qualifications recognition conventions (such as the Lisbon and Tokyo conventions for the European and Asia-Pacific regions respectively), the recently signed UNESCO Global Convention on the Recognition of Qualifications concerning Higher Education, the UNESCO-OECD Guidelines for Quality Provision in Cross-border Higher Education and UNESCO-APQN Toolkit: Regulating the Quality of Cross-border Education. However, the implementation of these initiatives and guidelines varies greatly depending on national interpretations and broader national regulatory frameworks and policy directives.

For example, not all countries regulate, monitor, or quality assure outbound or inbound TNE, and those that do, do it in different ways. Trifiro' (2019) offered a comparative analysis of the TNE regulatory landscape in four key sending countries (the United Kingdom, Australia, the USA and Germany) and four key receiving locations (China, Dubai, Hong Kong and Singapore), pointing out to the key differences in approaches. Importantly, no sending country has so far developed systems for the periodic quality assurance of individual TNE operations, and few receiving countries have developed frameworks to regulate inbound TNE, usually stopping short of providing regular quality assurance.

Similarly, there is no common approach for the recognition of TNE qualifications, with different countries not recognising TNE qualifications, or certain types of TNE qualifications such as those gained through online learning or collaborative partnerships with partners without local degree awarding power, or just simply TNE qualifications obtained in third countries.

It is precisely in order to respond to this absence of an agreed international framework for assuring the quality of TNE and recognising TNE qualifications, that Ecctis – the agency that has managed on behalf of the UK government the qualifications recognition service (UK ENIC, formerly UK NARIC) since 1997 - recognising the growing strategic importance of TNE globally, has developed a new international service that aims to offer the missing global solution for the quality assurance and recognition of TNE qualifications.

This is the TNE Quality Benchmark (TNE QB) whose primary purpose is, in the spirit of the UNESCO Global Recognition Convention, that of providing that independent and reliable foundation upon which international trust can be built and from which recognition is possible, contributing to support the global portability TNE qualifications for employment or further study and the growth of quality and relevant TNE provision.

3. The TNE Quality Benchmark

The TNE Quality Benchmark is intended as a tool that can help TNE education providers offering the international education community an external, independent and reliable demonstration that their TNE provision meet existing international expectations about quality and standards, therefore contributing to improve the recognition climate for TNE qualifications.

In particular, TNE QB is an international peer-review process through which education providers can offer external and independent reassurance that their TNE provision:

is of comparable standards to those of similar provision offered at its home campus (or across its delivery model for online learning);

provides a learning experience that enables students to achieve the expected learning outcomes;

is responsive to the education, training and skills needs of the location of delivery.

Reassurance is provided through a rigorous and independent peer-review assessment of an awarding institution's policies and practices for the management of TNE operations, and for securing the quality and standards of TNE provision, and how these are implemented through its TNE operations.

The particular strengths of the TNE QB scheme come from compounding four international dimensions:

- international scope;
- international standards;
- international peer review;
- international cooperation.

International scope:

This means that TNE QB applies to all TNE operations, regardless of the location of origin or delivery, hence for example it applies equally to Australian TNE in Malaysia, Malaysian TNE in Sri Lanka, UK TNE in China, USA TNE in the UAE, or German TNE in Egypt. This is important as TNE QB is intended as global solution, going beyond national solutions, where they exist.

International standards:

TNE QB can be international in scope because it is underpinned by international standards, standards developed in consultation with international experts (including the international TNE QB Advisory Board providing advise on the strategic direction of the scheme) and in alignment with existing international reference points, such as the principles stipulated in the previously referred UNESCO / OECD Guidelines for Quality Provision in Cross-Border Higher Education and the UNESCO / CEO Code of Good Practice in the Provision of Transnational Education (adopted by the Lisbon Recognition Convention Committee), which underpin the UNESCO Global Recognition Convention.

Consideration has also been given to the INQAAHE Guidelines of Good Practice in Quality Assurance and regional reference points including the European Standards and Guidelines for Quality Assurance in the European Higher Education Area, the Higher Education Quality Assurance Principles for the Asia Pacific Region, and the African Standards and Guidelines for Quality Assurance in Higher Education.

The TNE QB International Benchmarks consists of five general standards in five overarching strategic areas, with more detailed indicators for each standard illustrating specific expectations, as illustrated in table 1.

Table 1

<p>The Transnational Education International Benchmarks (TNE IBs)</p> <p><u>Management of the TNE operation</u></p> <p><i>Standard 1:</i> Awarding institutions should have robust processes in place for the establishment and management of TNE operations, sufficient to provide reassurance that its TNE provision meets expected standards and quality.</p> <ul style="list-style-type: none">• Indicator 1: The reviewed TNE operation is consistent with clearly outlined institutional strategies and objectives.• Indicator 2: Governance arrangements are in place to ensure that any form of TNE is ultimately overseen by the higher decisional authority of the awarding institution, clearly setting out the locus of responsibility and accountability at different levels of the awarding institution.• Indicator 3: Written and legally binding agreements or contracts set out the rights and obligations of all partners involved in a TNE operation, making clear their respective roles in the different aspects of the TNE operation.• Indicator 4: Appropriate processes for initial and periodic due-diligence and risk assessment for TNE operations are in place, including choice and management of partners, and covering all relevant aspects, such as academic, legal, and financial. <p><u>Standards of the program of study</u></p> <p><i>Standard 2:</i> Awarding institutions should ensure that their TNE provision is of comparable standards to those of the same or comparable provision delivered in their home.</p> <ul style="list-style-type: none">• Indicator 5: The admission of students for a TNE program of study, the teaching and learning activities, and the assessment requirements are equivalent to those of the same or comparable programs delivered by the awarding institution at the home campus (or across its delivery model, and in compliance with home country expectations, for online learning).• Indicator 6: TNE modules and programs are developed, approved, monitored, and reviewed through processes that are as robust as those for modules and programs provided by the awarding institution at the home campus (or across its delivery model, and in compliance with home country expectations, for online learning).• Indicator 7: Teaching staff must be competent, suitably qualified and experienced, and adequately supported to deliver the program to equivalent standards to those applied to comparable programs delivered by the awarding institution at the home campus (or across its delivery model, and in compliance with home country expectations, for online learning).• Indicator 8: The performance and outcomes of students on TNE provision is regularly monitored and benchmarked with the performance and outcomes of students of the same or comparable programs delivered by the awarding institution at the home campus (or across its delivery model, and in compliance with home country expectations, for online learning). <p><u>Quality of the student experience</u></p> <p><i>Standard 3:</i> Awarding institutions should ensure that students studying on their TNE provision receive sufficient support to enable them to achieve the expected standards</p>

- **Indicator 9:** Learning resources and support services in place at the delivery location, or made available by the awarding institution remotely, should give all students the opportunity to achieve the expected learning outcomes.
- **Indicator 10:** Appropriate training, briefing and support are provided to those involved in managing, delivering, and assessing TNE provision to ensure they are competent to undertake their roles and responsibilities.
- **Indicator 11:** Feedback is regularly sought from TNE students on all aspects of their study experience, and demonstrably responded to and taken into account; students are also given clear opportunities to raise complaints and appeals.
- **Indicator 12:** Awarding institutions have a duty of care towards their TNE students, and ensure that those students who wish to complete a program can do so in the event of closure or teach out.

Alignment with local requirements

Standard 4:

Awarding institutions should ensure that their TNE provision takes account of the expectations of the relevant authorities in the location of delivery

- **Indicator 13:** Local requirements for the delivery of TNE provision are well understood and complied with.
- **Indicator 14:** The education and industry need of the receiving location are duly considered and inform the strategic development of TNE provision.
- **Indicator 15:** The local context is taken into consideration when delivering TNE provision to ensure that, where applicable, programs of study are localized to maximize their relevance for students and the local industries.
- **Indicator 16:** Local qualifications frameworks, where these exist, are taken due account of when delivering TNE provision, informing articulation and credits transfer arrangements with local qualifications.

Information to students and the public

Standard 5:

Awarding bodies provide complete descriptions of programs of study and qualifications to perspective students and relevant stakeholders

- **Indicator 17:** Information about the program of study and qualifications awarded are made clear to prospective students at recruitment stage, including in respect of the legal status of qualifications awarded and their local and international recognition for further studies and employment.
- **Indicator 18:** Information about available programs of study, the learning experience, student support and services, and complaints and appeal, is made clear and accessible to students, ensuring that student expectations are transparently managed.
- **Indicator 19:** Awarding institutions maintain effective control over the accuracy of all public information, publicity and promotional activity relating to the TNE programs of study leading to their awards.
- **Indicator 20:** Awarding institutions retain the ultimate authority and responsibility for awarding certificates and records of study, and provide clear and up to date information about the program of study undertaken by TNE students upon graduation, through study transcripts or equivalent documents.

International peer-review:

The scheme can review TNE operations against international standards by utilising international peer-review. TNE QB review teams are composed of peer-reviewers from and with understanding of the host country education and regulatory landscape and peer reviewers from and with understanding of the sending country education and regulatory landscape. This composition permits to implement

the international standards underpinning TNE QB with a sound understanding of the local operating and regulatory environments involved in the TNE operation being reviewed.

There is also an additional and very important level of international peer scrutiny offered by an independent Advisory Board composed of leading international experts and practitioners in the field which offers strategic advice to the development of the scheme, and acts like an independent accreditation board reviewing the outcomes of TNE QB reviews. This ensures that reviews are aligned with the international standards and are based on sound evidence.

The board plays a key role in underpinning international trust in benchmarked operations as well as in developing global strategic engagement, which is the fourth international dimension.

International cooperation:

TNE QB is embedded in international cooperation. Indeed, it aims to catalyse international cooperation across the quality assurance and qualifications recognition communities and between sending and receiving countries. This is key to build that shared understanding and trust required to improve the recognition of TNE qualifications. Thus, over the past months, UK ENIC has developed formal strategic cooperation with

- the Asia Pacific Quality Network (APQN) and the Arab Network for Quality Assurance in Higher Education (ANQAHE) with a view to developing platforms of dialogue and cooperation to support the growth of quality TNE in the regions, including through the sharing of expertise and experts.
- the China Education Association for International Exchange (CEAIE) and the Egyptian National Authority for Quality Assurance and Accreditation of Education (NAQAAE), with a view to informing cooperation in TNE review activity in these countries and regions.
- the China Service Centre for Scholarly Exchange (CSCSE), the Chinese national qualification recognition body, with a view to helping with the recognition of TNE qualifications obtained in third countries (i.e. outside of China). T

The latter partnership is an example of progressive cooperation between qualification recognition bodies aimed at widening the opportunity for students to choose a wider range of international education options, including TNE Programs offered internationally, as long as they can be of demonstrated quality. It is about facilitating the recognition and portability of TNE qualifications of demonstrable quality.

4. Conclusion

As outlined above, the TNE QB scheme has been developed in response to the global quality assurance challenge to the recognition of TNE, as a concrete initiative responding to the call underpinning the UNESCO Global Recognition Convention for new tools capable to provide reliable and consistent QA of TNE qualifications, tools complementary to national solutions, and capable to catalyze cross-border cooperation across the quality assurance and qualification recognition communities of sending and receiving countries.

This is aligned with one of the key strategic recommendations of a study carried out a few years back through funding from the International Network for Quality Assurance Agencies in Higher Education (INQAAHE) on cross-border cooperation in the quality assurance of TNE, which was foster cross-border cooperation across the QA and qualification recognition communities, involving in the process all other key stakeholders such as governments and providers, to address regulatory *gaps*, *overlaps*, or *mishaps*, and support the portability of TNE qualifications.

This INQAAHE study was carried out to follow up the development of the Quality Assurance of Cross-Border Higher Education (QACHE) Toolkit, as part of the EU funded QACHE project led by the European Association for Quality Assurance in Higher Education (ENQA). The QACHE project identified a key vicious circle affecting the quality assurance and recognition of TNE qualifications, whereby lack of information and communication leads to lack of trust and lack of cooperation. The idea of the QACHE project was to develop a toolkit providing practical advise to QA bodies on how they can engage strategically across borders to revert this vicious circle into a virtuous circle, whereby regular communication and information sharing between QA bodies, would foster trust and eventually cooperation in quality assurance.

These initiatives demonstrate that a shared view is emerging across quality assurance and qualification recognition bodies. This is the view that quality assurance and qualification recognition activities should be enablers not inhibitors of quality TNE, and that key to realising this shared view is to develop shared understanding and trust to the benefit of what the international education community has at heart, quality education. It is about working together to unleash the progressive potential of TNE for more inclusive, sustainable and relevant paths to learning.

The TNE Quality Benchmark scheme aims to contribute to this aim by offering an international quality assurance tool that can improve international understanding of and trust in TNE qualifications of demonstrated quality and standards, a tool that can also offer a platform for cooperation between quality assurance and credential evaluator agencies across sending and receiving countries of TNE and international student mobility.

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Independent Assessment of Education Quality: Prospects for Digitization

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Abstract

This article discusses independent assessment of the quality of education, development of added value of the accreditation procedure, the formation of registers of accredited degree programs in the Russian Federation and globally. It discusses the trends in the internationalization of education, their impact on conducting independent assessments of the quality of education. The article shows various practices of organizing registers of accredited educational institutions and degree programs in the context of digitalization.

Keywords: professional public accreditation, degree programs, State Educational Standard, professional standard, internationalization of education, digitalization, international accreditation.

1. Introduction

System of higher education have a long history, while QA systems are currently only at the beginning of the evolution. National and international QA agencies are the part of most of these systems. Their tasks are to ensure trust and guarantee the quality of education, promote the satisfaction of the stakeholders, and stimulate the introduction of innovations in the educational process.

In this article, the authors consider independent assessment of the quality of education that is currently used in Russia, namely professional and public accreditation of degree programs and institutions (Azaryeva, Zvezdova, & Martyukova, 2016). Independent assessments of the quality of education include assessments carried out at institutional, program and qualification levels (Azaryeva, Vladimirtsev, & Zvezdova, 2017). In the case of professional and public accreditation, the program level of assessment is legally established, but international accreditation can be carried out both at the program level and at the institutional level (Silaeva, Zvezdova, Vladimirtsev & Dolgikh, 2018).

Digitalization and the active use of big data is a necessity for any area of life in modern society, including education. Russian education is ready to move to a new level of using big data, to centralize processing and access to information for all the stakeholders. Big data will become the basis for educational leaders to make right decisions and the basis for building relevant educational strategies. In turn, the data of independent assessments of the quality of education makes it possible to build state educational policy (Vasilyeva).

The aim of the study is to monitor motivational factors for an independent assessment of the quality of education, change the added value of assessment procedures in the context of digitalization, use big data technologies to organize registers of accredited programs and institutions at the national and international levels, and develop algorithms for using these registers by the stakeholders.

2. Materials and Methods

The study employs the results of previous studies in the field of assessment of the quality of education, analytical reviews, thematic analysis and the monitoring data of legal environment. To solve the problem of receiving information, which could be valuable for the stakeholders in the area of QA of higher education, we use the method of algorithmizing, as the process of creating an algorithm for solving a problem.

An algorithm is an exact road map that defines the process; it leads from variable source data to the desired result. The algorithm always covers all possible situations that may arise in the process of solving a set of tasks. The algorithm obtains several features, such as discreteness, determinism, effectiveness, massiveness, and effectiveness of the algorithm.

The algorithm should provide a strict and clear sequence of actions, so the way of setting it is essential for it. It can be written in various ways. In this paper, a block diagram is used to graphically represent the structure of the algorithm. In accordance with the flowchart, the sequence of actions is indicated by arrows that connect the individual blocks and indicate the sequence of the performance. The main algorithmic structures are represented by using special graphic symbols.

3. Results

An analysis of motivational factors of an educational institution for conducting an independent assessment of the quality of education showed that in case of professional and public accreditation the main factors are the impact during state accreditation, distribution of enrollment numbers, and documented recognition of the anchor employer. The certificate of accreditation is also important for the stakeholders, as it confirms the relevance of the chosen program for future employment. Regarding quality guarantees, the opportunity to improve the degree program is of great importance. The improvement of the program is ensured by the work of an external expert panel, which includes the representatives of the academic community. In this case, there is a reflection of experience, the experience of designing, developing and implementing degree Programs. Besides academic experts, the commission includes the representatives of the professional community, the experts of in the area of relevant industry, as the degree Program is aimed at ensuring the need in human resources in this area. It is necessary to ensure the feedback, as it provides adding value by recognizing the strengths of the educational institution, identifying the best practices, and taking into account the recommendations of experts in the planning cycle.

Thus, the approach of professional and public accreditation involves cross-subjectivity by including academic experts, the representatives of professional and student communities, as well as the representatives of international agencies for guaranteeing the quality of education. The presence of international experts is very important, as it ensures the replenishment of databases of best practices in QA, such as the International Network for QA Agencies in Higher Education (INQAAHE) deals with INQAAHE Database of Good Quality Assurance Practices (GPQA), an interactive collection of searchable systems and activities that are related to good QA policies, practices and results.

By the order of the Russian Ministry of Education and Science, the system of “Monitoring of professional and public accreditation” was created ([http:// www.accredpoa.ru](http://www.accredpoa.ru)) to provide effective informational support of implementing the procedures for professional and public accreditation of degree Programs in the Russian Federation. The list of agencies conducting professional and public accreditation of degree programs, professional training programs and (or) additional professional Programs (hereinafter referred to as the List) is available on the official website of the Russian Ministry of Education and Science. The Decree of the Government of the Russian Federation No. 431 of April 11, 2017 approved the Rules for the formation and maintenance of this List. Figure 1 presents the algorithm for using this resource:

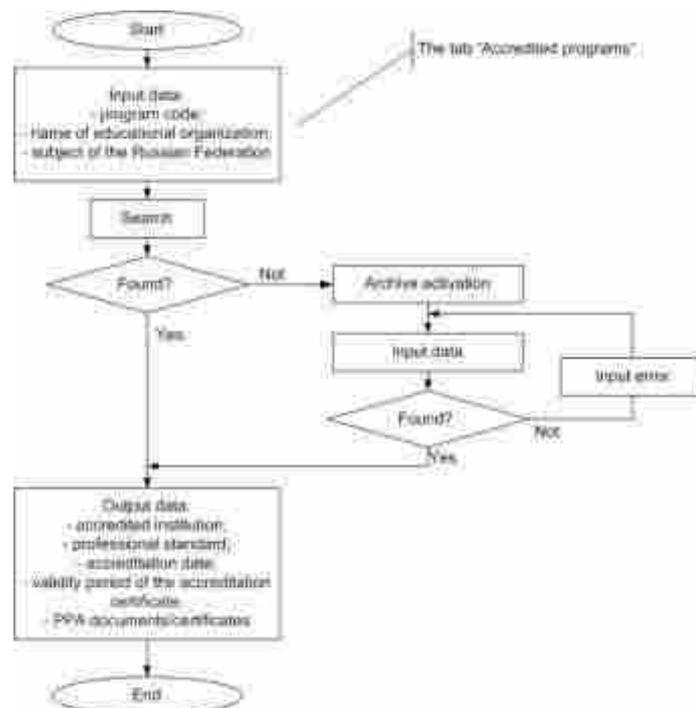


Fig. 1 Flowchart of the search algorithm for an accredited degree program

We set the name of the Program in “Accredited Programs” tab as “Pedagogical Education”, the educational institution as “M. Akmulla Bashkir State University” and the subject of the Russian Federation as “Bashkortostan”, at the end we get the data that the accrediting agency was “Certification Association “Russian Register”, the assessment was made for compliance with the professional standard “01.004 Teacher of vocational, tertiary and supplementary professional education”, the validity period of the certificate of accreditation is from 08.22.2019 till 08.21.2024. The scan of the certificate with the appendices is also provided.

QA agencies create added value for an educational institution, using international approaches to an independent assessment of the quality of education, conducting international accreditation procedures, paying considerable attention to evaluating the mechanisms of internal quality guarantees introduced in the educational institution (Azaryeva, Zvezdova, 2017) (Silaeva, Semenov, & Zvezdova, 2018).

The results of QA assurance agencies is guaranteeing the quality of international higher education. International accreditation is a basis for the internationalization of national systems for guaranteeing the quality of higher education (Motova, 2016). In this case the creation of added value is determined by the degree of trust to the accreditation agency and the recognition of decisions based on the results of the procedure (Azaryeva, Zvezdova, 2018). The recognition of the results of an accreditation examination depends on the recognition of an agency by a QA network.

In order to accredit joint degree Programs, a different mechanism is used. The European Accreditation Consortium define the joint diploma as “one document recognized at the national level as an officially recognized diploma / degree of a joint Program and signed by authorized persons representing Universities participating in the issuance of joint diplomas / degrees” (Motova, 2016). Serious preparation is required to organize the procedure of joint international accreditation, since it is not only about the involvement of individual representatives of the international expert community, but it is the participation of an international accreditation agency (Matveeva, 2016). The staff members of the educational institutions who participated in this type of accreditation note that this procedure is complex and lengthy, but it creates added value by forming competitive advantages of an accredited degree Program in the international educational services market (Zagorodniuk, 2016). Thus, according to estimates of the leading world organization in the field of international education and student exchange (NAFSA), international students studying in American colleges and Universities, bring the US economy 36.9 billion US dollars and provide 450.3 thousand jobs. The development of joint degree Programs stimulates student mobility: in 1975 approximately 0.8 million international students studied in EU countries, from 1990 to 2010 it became 4.4 million, and in 2015 it reached 4.6 million. According to NAFSA, the number of joint degree Programs in the EU countries in 2009 was 2500, and so far this figure has increased by at least 2 times. It is obvious that for the successful implementation of joint degree Programs, the high quality of the Program and its independent evaluation are of the key importance and are among the most important factors in the choice of the degree Program by applicants.

Currently, QS rating is used for national research Universities, which considers only resource indicators are used in assessing international activities: the number of international foreign teachers and foreign students at the university (Zavarykina, Lopatina, & Perfilieva, 2012). Taking into account that one of the goals of international accreditation is to attract international students, it can be noted that the added value of the accreditation lies in improving the University’s position in the global ranking.

An important motivating factor for international accreditation of degree Programs is the formation of the European register of accredited higher education programs – Database of External Quality Assurance Results (DEQAR) (<https://www.eqar.eu/qa-results>). DEQAR obtains the data about educational institutions and Programs that have undergone international accreditation and become more recognizable and understandable for international students. A place in the register also greatly facilitates the participation of educational institutions in international projects and exchange

Programs. In addition, by 2020, the graduates of such Programs accredited by European standards will receive recognition of their diplomas in 47 countries that are the part of the Bologna process. This expands the opportunities for employment in foreign companies or continuing studies on mobility programs. In this case, it is important to understand that the inclusion of a degree Program in such a database does not mean recognition of a graduate’s qualifications. In other words, the result of the Program / institutional accreditation does not extend to the qualification level. The main goal of creating such a register is to ensure information transparency and openness of both accreditation procedures and their results. Any stakeholder can see the reporting documents, many agencies use integrated IT services to ensure automatic filling of both the above-mentioned registry and the registry, which is maintained at the website of the QA agency in accordance with European standards. First of all, one considers the search option by the name of the educational institution at the Database’s page. For example, the name the educational institution is “Peter the Great St. Petersburg Polytechnic University”. As the output, we get information about the University (city, country and website) and an identification number in the system for future use. It also determines the level of accreditation (in this case, Program), the accrediting agency (“ANO “National Center for Professional and Public Accreditation”) and the opportunity to view the reports on the degree Program of interest. If the search fails, then either there are no accredited Programs of this institution, or an error occurred while entering the source data. The described algorithm is presented below in Figure 2. Figure 3 shows the representation of Peter the Great St. Petersburg State University in this register.

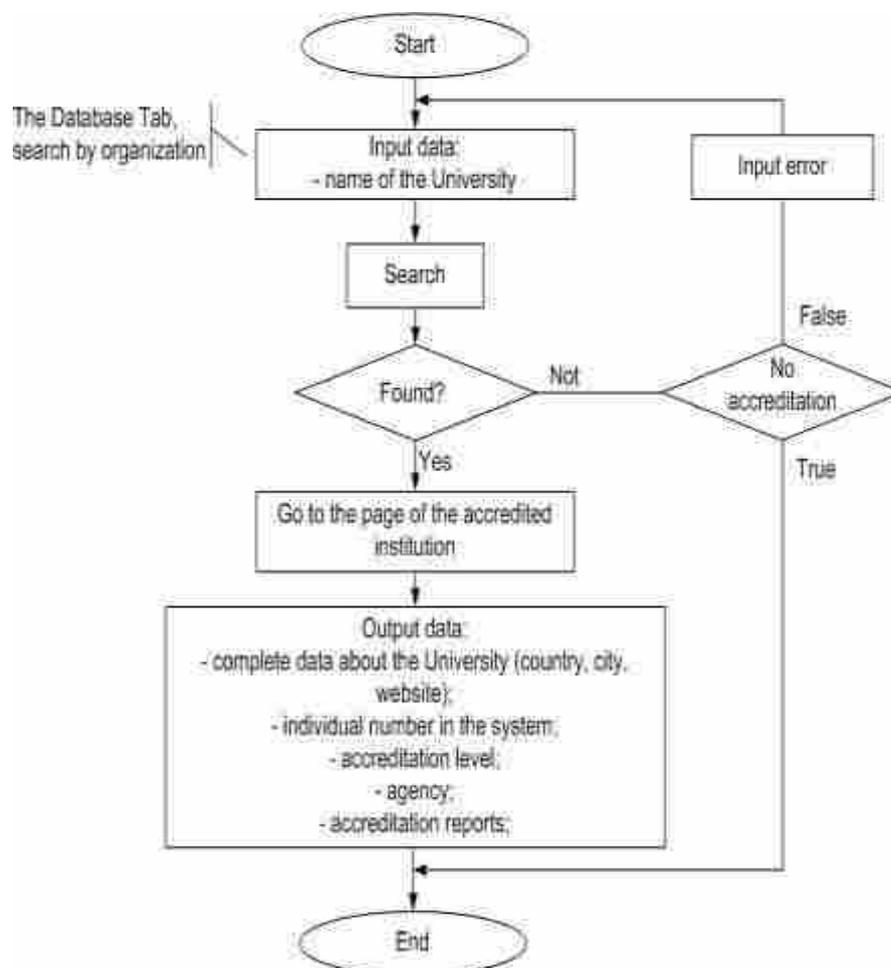


Fig. 2 Flowchart of the algorithm for using DEQAR registry

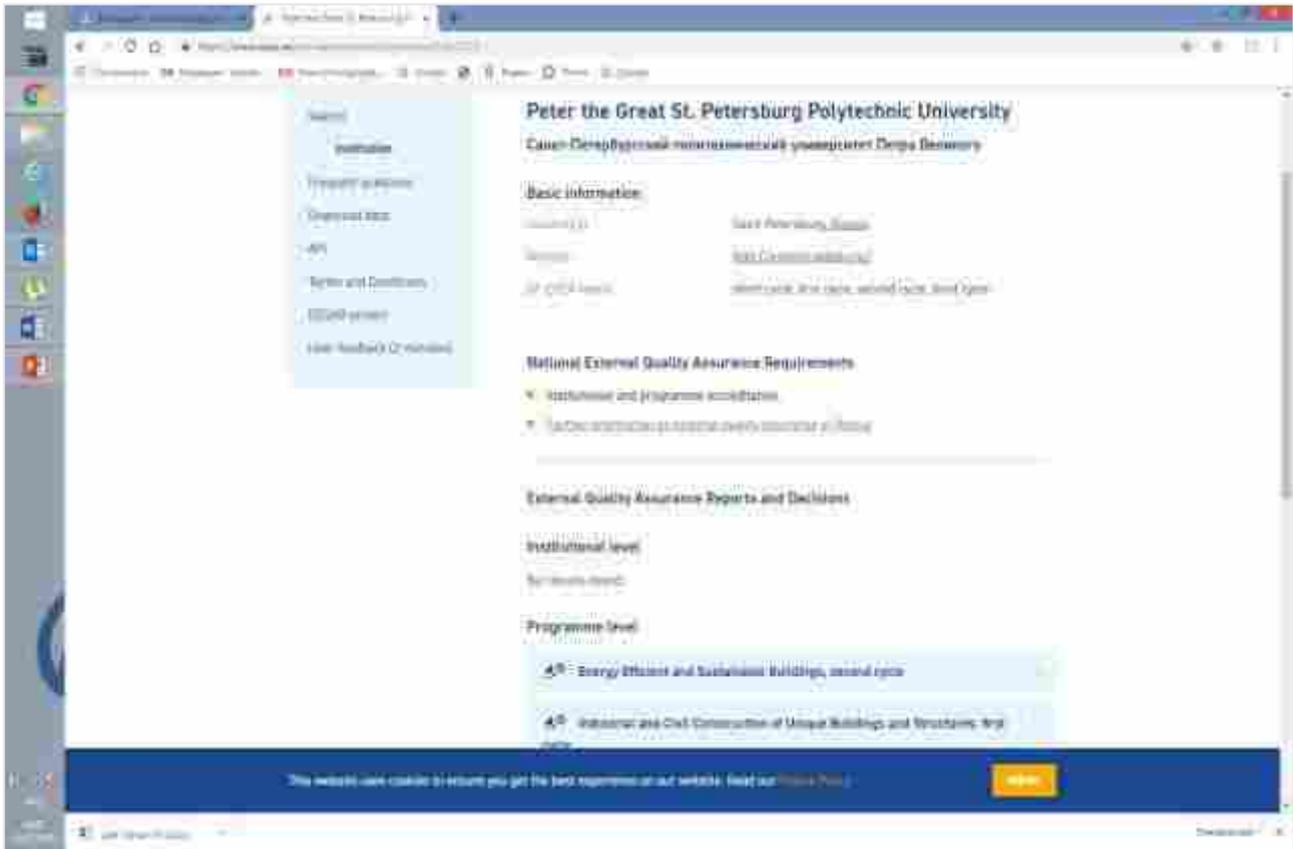


Fig. 3 Program accreditation at Peter the Great St. Petersburg State University

There are other registries that already have a long history. These are registries of programs marked with the European quality marks. Programs labeled EUR-ACE®. It is an important component of the European Engineering Education Database (EEED) of the European Federation of National Engineering Associations (EFNA). Programs are automatically added to this database for potential graduates to receive the EUR-ING (Euroengineer) title. This helps to increase the status of a Russian engineer to an international level, thereby increasing mobility and flexibility in choosing jobs for university graduates. This system of recognition of the results of accreditation procedures includes 15 authorized QA agencies linked by a mutual recognition agreement since 2014. Figure 4 shows the table of this registry with the search options (<https://www.eurace.efna.eu>).

Database of EUR-ACE® labelled programmes

In this database you find the engineering degree programmes at First Cycle (Bachelor), Second Cycle (Master) and Second Cycle Integrated (Master) which have been awarded the EUR-ACE® label by ENAEE Authorized Agencies. EUR-ACE Label certificates are valid only if the degree programmes which are listed on them are listed also in this database.

Misc info

Select the information that you need using the criteria above. You can also use the "keyword" box if you know part of the name that you seek (e.g. "manufacturing"). Then apply "Filter". Clicking on a programme name will provide further details on the programme and the awarding HEI.

Overview | By degree type | By country

Using this filter provides a list of EUR-ACE labelled programmes that correspond to the criteria you set above

Accreditation agency	HEI name	Programme name	Degree title	Degree type	Accreditation period	Country	City (local)
AEER	Serjey Shain University named after Shukarm	Food Technology	Bachelor of Engineering	FGD	20/10/2010 until 20/10/2015	Kazakhstan	Gemeli
AEER	Serjey Shain University named after Shukarm	Processing Machinery and Equipment	Bachelor of Engineering	FGD	20/10/2010 until 20/10/2015	Kazakhstan	Gemeli
AEER	L.N. Gumiyov Eurasian National University	Automation and control	Bachelor of Engineering	FGD	22/03/2011 until 21/03/2016	Kazakhstan	Actava
AEER	L.N. Gumiyov Eurasian National University	Organization of transportation traffic and operation	Bachelor of Engineering	FGD	22/03/2011 until 21/03/2016	Kazakhstan	Actava
AEER	L.N. Gumiyov Eurasian National University	Standardization, Metrology and Certification	Bachelor of Engineering	FGD	22/03/2011 until 21/03/2016	Kazakhstan	Actava
AEER	Kazakh National Technical University named after K.T. Satpaev	Chemical Engineering of Organic Substances	Bachelor of Engineering	FGD	22/03/2011 until 22/03/2016	Kazakhstan	Almaty
AEER	Kazakh National Technical University	Chemical Technology of Inorganic	Bachelor of	FGD	22/03/2011 until	Kazakhstan	Almaty

Fig. 4 The EUR-ACE® database

Let us consider the features of the search for accredited Programs and agencies in this registry using context menu. For example, one can specify the name of the Quality Assurance Agency (in this case, ASIIN), the country (Russian Federation) and, if known, the name of the educational institution, degree Program or any other keyword. In this case, when clicking “Filter” button, the search already yields the result: National University of Science and Technology “MISIS” with the degree Program “Multicomponent nanostructured coatings. Nanofilms.” The graduates receive the qualification “Master of Metallurgy”; it is a Master’s degree Program, the validity period of the certificate from 27.03.2015 till 30.09.2020. If a search by the name of the agency and country does not give any results, this means that the specified agency for does not work with this labeling procedure. Fig. 5 shows the search algorithm for the considered situation.

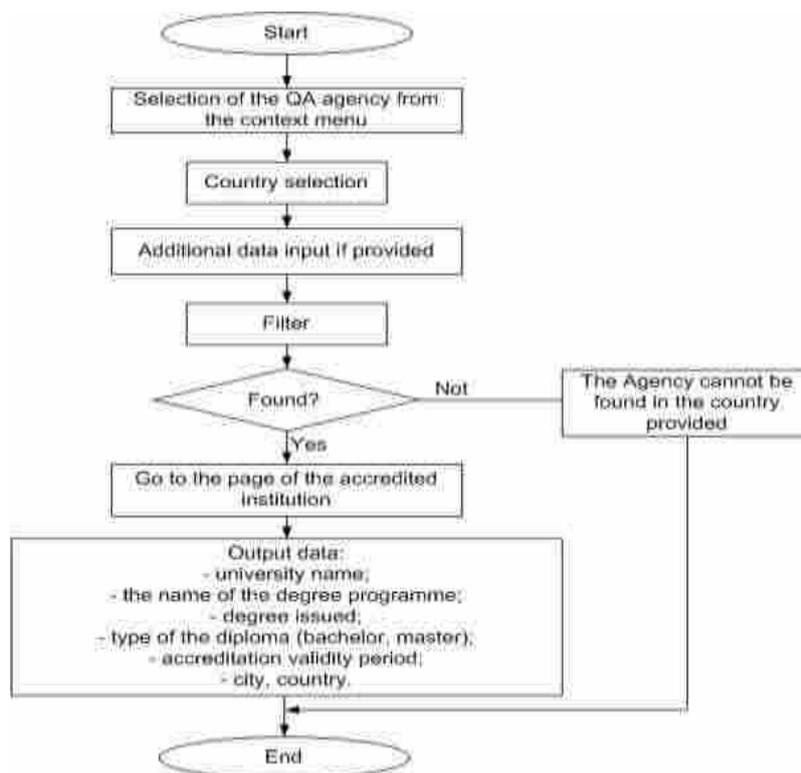


Fig. 5 Flowchart of the algorithm for using the registry of labeled programs

What added value does the accreditation procedure and placement of the Program in this registry create? The leaders of degree Programs have the opportunity to assess the compliance of Programs with the requirements of recognized European standards, apply the approach to assessing learning outcomes, and the possibility of continuous improvement. Stakeholders such as students and graduates can gain confidence that their chosen areas of training meet the highest requirements. In addition, it facilitates vertical and horizontal mobility, as well as the opportunity to continue studies at a Master's Program for the graduates of undergraduate programs who have received the EUR-ACE® label. The European Commission has recognized the EUR-ACE® label as a best practice, which adds added value to an accredited educational institution.

4. Discussion

QA continues to be an area of dynamic development in the European Higher Education Area (EHEA). The development of the ideas of Bologna process led to creation of ENQA; development of ESG for ensuring the quality of higher education in EHE; establishment of EQAR and development of “European Approach for Quality Assurance of Joint Programs”. To apply uniform standards for assessing QA independent Quality Assurance Agencies have been established.

The Asia-Pacific network has not only created and selects applicants to the APQR registry, but is also actively promoting labeling procedures by assigning the APQL quality label to degree programs according to the criteria for internationalization and SLO.

The creation of an international database of accredited educational organizations and programs, UNESCO conventions on the recognition of global learning, new agreements on mutual recognition on the basis of international conventions on learning outcomes can also be considered as new QA tools.

5. Conclusions

The article considers the types of independent assessments of the quality of education, the principles of functioning of the national registers of accredited educational programs, motivational factors for passing assessment procedures, and the formation of added value. It shows the development of the trends of quality guarantees in higher education, and analyzes the added value of accreditation, which results in the placement of an accredited educational program in European and national registries in the current digital environment, which accumulates large volumes of specialized information. The research also presents the algorithms for obtaining information from the registries database by the representatives of the stakeholders.

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Making Concerted Efforts for the Healthy Development of China's Higher Education in the Context of COVID-19

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Abstract

In 2020, higher education around the world has experienced a battle against the COVID-19 outbreak and has generally ensured the smooth operation of teaching and learning. This paper discusses some successful practices of Chinese higher education in the fight against the pandemic, with the aim of promoting exchange.

Keywords: COVID-19, higher education, anti-pandemic experience

In 2020, higher education in China was greatly struck by the outbreak of COVID-19. Facing challenges, China's higher education insisted on adhering to the college and university education and has achieved satisfactory teaching results. Looking back on the persistence of colleges and universities in 2020, it was an unforgettable experience of working together to overcome the difficulties.

1. Flexible Implementation by Local Governments and Colleges and Universities under Unified Deployment of MOE

Under the leadership of the Central Committee of the Communist Party of China (CPC), the Ministry of Education (MOE) has uniformly deployed pandemic control and prevention as well as teaching activities of colleges and universities nationwide. After the outbreak of the pandemic, the Ministry of Education studied the situation immediately and made a decisive decision. On January 29, 2020, in the middle of the Spring Festival holiday, the relevant official of the Ministry of Education revealed in an interview that all kinds of schools, colleges and universities around the country would postpone the opening of the school, and actively prepare for "ceasing schools and classes but continuing teaching and learning"^[1]. On February 4, the Ministry of Education issued *Guidelines on the Organization and Management of Online Teaching in Colleges and Universities During the Pandemic Prevention and Control Period*, deciding to implement online teaching in colleges and universities across the country. After the guidance was released, local education administrative departments and universities responded quickly, and formulated online teaching programs with one program for one location, one Programs for one school or more Programs for one school in different situations in accordance with the requirements of "ceasing schools and classes but continuing teaching and learning".^[2] In early April, *Guidance for Control and Prevention of COVID-19 pandemic in Colleges and Universities* was jointly issued by the National Health Commission and the MOE, providing guidance on controlling and preventing COVID-19 and promote the resumption of classes. The MOE also issued a series of guidance documents on important matters such as teaching, final examinations and graduate employment for colleges and universities to make unified arrangements and ensure the smooth progress of educational and teaching activities.

On the basis of the specific situation of the pandemic and the regional differences in economic and technical foundation, all localities carefully prepare for the resumption of school and classes in colleges and universities under the unified deployment. Each region made different arrangements for the resumption of classes in accordance with specific conditions of schools and students. While carrying out online education, all localities deployed pandemic control and prevention for students

who return to school or stay in school, laying sound foundation for the resumption of classes. In April, colleges and universities all over the country basically resumed classes.

2. Making Full Use of Online Education Technology to Respond Actively

The outbreak of COVID-19 has inevitably affected the education. Under the leadership of the MOE and local governments, colleges and universities have made full use of contemporary information technology to actively and steadily carry out education and teaching.

Different from face-to-face teaching, online teaching has some obstacles in full communication, and many teachers are not familiar with online tools, so there were some difficulties at the beginning. A large number of teachers finds it challenging to teach online for they are unfamiliar with platforms and tools of online education, while students may be limited to network conditions and communication devices, making it hard to get the predetermined teaching effect. Colleges and universities fully understand these deficiencies of online teaching and actively take remedial measures, including 1) organizing teachers to attend training of teaching software in advance; 2) developing teaching system integrated with online teaching and Massive Open Online Course (MOOC) to take full advantage of the original teaching resources; 3) arranging teachers to give online trial lectures and supervisors to attend classes to provide guidance; 4) developing assignment discussion platforms for students and teachers to discuss homework online and offline; 5) allowing students, especially students in graduation design stage, who have to do experiments returning to school to do experiments, so as to meet the needs of experimental support for some courses; 6) providing some teachers who have difficulties in teaching at home with classrooms and full-time staff to assist in teaching; 7) designing video examination systems to make online examination possible and ensure its fairness. Most schools have set up a technical support team to solve the problems occurred in online education in a timely manner, in order to ensure the quality and effect of online education. All colleges and universities hold a same purpose that teaching quality cannot decline because of the suspension of classes.

In the spring semester of 2020, all regular undergraduate colleges and universities nationwide implemented online teaching, with 1.08 million teachers offering 1.1 million courses, a total of 17.19 million courses. A total of 22.59 million college students participated in online learning, totaling 3.5 billion students. 91% of Chinese colleges and universities offer online courses, 80% of teachers approve of online teaching, and 85% of students are satisfied with online teaching, effectively achieving the quality equivalence between online teaching and classroom teaching.^[3] An opportunity brought by the pandemic to higher education is to greatly promote the development and application of educational information technology. Although a lot of efforts and funds have been invested during the earlier development of MOOC, its effect is limited, and the utilization rate is not high. The outbreak of the pandemic forced higher education providers to use online technologies, which then exposed the original design problems of MOOC. To solve these problems, the technologies have been improved rapidly, and teachers have changed their teaching habits and promoted online teaching skills. This is why there is a paper mentioning that higher education has been forced to reform due to the pandemic^[4].

3. Exploring and Working Actively to Ensure the Quality of Online Education

Teachers in colleges and universities are the main force to stick to education during the pandemic. The suddenly changed teaching mode makes most teachers face new challenges. Some teachers reflect that offline teaching can see students' eyes and expressions to know whether students understand. Now they have to list the problems that students may encounter as usual. If there was no time to talk in class, they have to put them on the Internet for students to browse or communicate with students on the discussion platform. Teachers who have taught a course for more than a decade have further pondered over the material and collected new information in an effort to incorporate new teaching content. Teachers who are used to write on blackboard have to study how to design better PPT to make full use of class time online. Many teachers responsible for experiment class have developed online experiments with AR technology, enabling students to experience remotely to enhance their understanding of theoretical knowledge. Some even make it possible for students to make online appointments to do experiments, design individual experiments, change data, and submit experimental reports ^[5].

According to teachers who prepared online teaching during the pandemic, it took them more time to give a good lecture than before. They generally have a strong sense of teaching responsibility and believed that students' learning should not be affected by the pandemic. Therefore, teachers took the initiative to put more effort into keeping students interested in the curriculum and willing to devote themselves to learning, aiming at offering online education with the same quality as that in offline class.

4. Overcoming Difficulties to Complete Course Arrangements

Affected by the pandemic, students' learning lacks a collective environment such as classrooms, dormitories, playgrounds and laboratories. Some students' learning and activities generally become loose and their enthusiasm is reduced.^[6] To engage students in online class, teachers and school managements have come up with many ways, including asking students to turn on videos to check if they are online; designing small questions and asking students randomly to keep them focused; increasing homework, requiring students to finish on time and offering timely feedback; demanding step-by-step reports of students to assure the experiment effect despite it is conducted remotely. These mandatory measures are effective in improving students' participation of online class, but a more effective measure is to improve the teaching quality. The combination of improving class participation and teaching quality will be better. For example, many schools hold webinar for students to interact, discuss, and even argue with each other. It is of great help to increasing class cohesion.

It should also be noted that there are great differences in students' online learning conditions. Many students rely on smart phones to complete classroom learning, and the video quality will affect the teaching effect. Moreover, some students in remote area have a poor network environment, which affects their normal learning. For this, many schools also actively try to let some students with practical difficulties come to school to complete their learning. In general, students basically completed their online course learning from the beginning of the semester to the final exams. The exam results indicate that the students' learning results are still at an acceptable level.

5. Summarizing Experience and Identifying Problems for Further Development of Education

The COVID-19 has spread globally, and higher education is experiencing tough time. The Ministry of education of the people's Republic of China coordinates and guides local education administrative departments and colleges and universities to grasp the overall situation, control risks, scientifically recognize change, actively respond and actively seek change, have the courage to take responsibility and innovate in turning danger into opportunity, and vigorously promote the in-depth integration of information technology and education and teaching. The education and teaching work of colleges and universities presents a new development situation. All countries have their own experience. Summing up our experience, strengthening top-level design, unified command, mobilizing the enthusiasm of teachers and concerted efforts of all parties are the valuable benefits of the success of the anti-pandemic. A pandemic also makes us see some deficiencies in the original educational design. "Keep your mind and strength in the same place", then higher education will develop smoothly.

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Modernization of Educational Evaluation's Governance Driven by Blockchain Technology

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Abstract

Blockchain was firstly proposed by Nakamoto in his paper on bitcoin which is one of the popular technologies at present. It is a distributed database composed of blocks recording all kinds of information linked through network. Blocks are used as its storage unit, and all blocks record the all-data information linked into network nodes through random hash links. According to the construction and management of blockchain network, node access conditions and application mode of blockchain technology can be divided into public chain, private chain and alliance chain ^[1], which has the characteristics of decentralization, openness, high trust, consensus mechanism, tamper proof and smart contract. Based on the above characteristics, the blockchain endows its stored data with the characteristics of unforgeability, whole process trace, traceability, openness and transparency, collective maintenance, and it can effectively improve and solve the problems such as data barriers, information delays, trust crisis and so on in the information age.

1. Introduction

In recent years, many countries have begun to explore blockchain technology and its application. China has also paid more and more attention to the impact of this technology on social and economic development. Meanwhile we continuously issued relevant policies to accelerate the application of blockchain, widely studied and applied in many fields such as finance, insurance and medical treatment. However, now the application of blockchain technology in China's education is still in its infancy, It is rarely used in the field of educational evaluation.

Thus In 2020, the Ministry of Education issued the action plan for blockchain technology innovation in Colleges and universities, pointing out the direction for the application research of blockchain technology in the field of education, but the research and promotion of education evaluation in China is relatively slow, and most of the focus is still on Evaluation policies and systems rather than evaluation technologies and methods themselves.

With the transformation of China's higher education from high-speed growth to high-quality development, higher education evaluation should also change from quantity to quality. The evaluation thought gradually changed from the "resource view" focusing on final results and absolute achievements to the "value-added view" focusing on development process and relative improvement ^[2]. The questions on how to use information technology to improve data effectiveness, take into account the advantages of quantitative evaluation, integrate non-quantitative information and data, accurately read and write and meet the information age's needs of data-based evaluation objects have become an important task for educational evaluation to break through technical barriers.

2. Problems in traditional high educational evaluation

Digital information is the most basic and important evaluation basis in the process of education evaluation [2]. However, most evaluation data are independently provided by colleges and universities, which is prone to the following problems.

1. Data objectivity and authenticity cannot be verified and considered uniformly;
2. The integrity of evaluation data cannot be guaranteed;
3. The repeatability of evaluation data leads to high evaluation cost;
4. The evaluation results are delayed;
5. The appraisal subject is relatively single.

As an innovative technology concerned by all walks of life, the emergence of blockchain will inject strong impetus into the high-quality development of educational evaluation, help realize the procedural, value-added and comprehensive objectives pursued by the modernization of educational evaluation governance, and build a more scientific and reasonable high-grade education evaluation system.

3. Blockchain technology helps modernize education evaluation and Governance

(1) Esurance of objectivity of evaluation data

Firstly, to make use of the non tamperable characteristics of blockchain technology information to ensure the objectivity of evaluation data. By formulating a unified standard for the writing of college education evaluation data, a consensus mechanism within a system is formed. Then the reading and writing of information could be set according to the consensus mechanism of the alliance chain, which reduces the possibility of data fraud and the data verification link in the evaluation link.

(2) Esurance integrity of evaluation data

To build a low-level interworking, layered and open data interaction system, each user can record and store data dispersedly. To reduce the bottom flow, solve the phased problem of evaluation data can ensure the process and integrity of data, and strengthen the support of process evaluation. At the same time, time stamp and other functions are used to improve the reliability of recorded data.

(3) Avoidance of duplication on evaluation data

Taking advantage of the characteristics of decentralization and non-tampering, it is considered that as long as the data existing on the blockchain is real and effective, all departments can read information from the chain and exchange real-time resources, so as to minimize the cost problems caused by the data gap, and avoid the non-exchange of data among evaluation departments, multiple filling in by colleges and universities, different data sources, different statistical caliber, etc, We will effectively reduce multiple and repeated evaluations and reduce the burden on grass-roots units and schools.

(4) Solutions for delay on evaluation results

After reaching a consensus mechanism, the evaluation unit can use the consensus verification and tamper proof characteristics of the blockchain to establish an evaluation alliance chain.

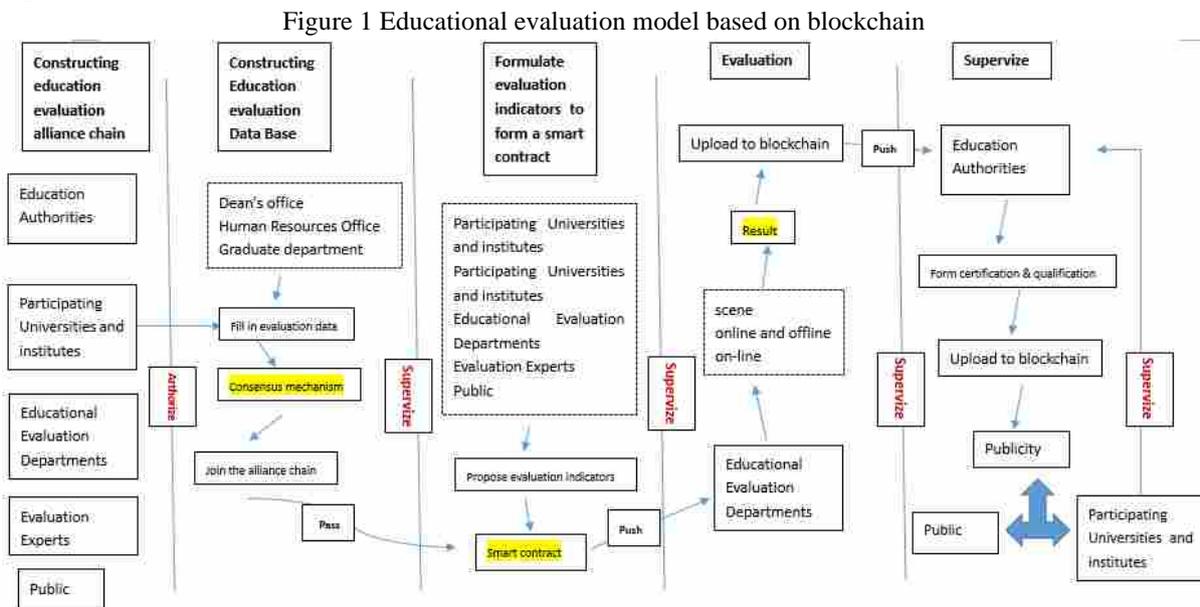
The review experts access the data on the chain through the public key and feedback the evaluation and scores to the blockchain in real time. After the expert review is completed, colleges and universities can directly view the review results, eliminating the links such as third-party statistics and publication, and solving the problem of delay in the evaluation results.

(5) Building an evaluation system with multiple participation

To make use of the decentralized characteristics of blockchain technology, expand the composition of third-party subjects, involve experts, teachers, parents, society and other subjects, put forward evaluation indicators, form smart contracts can make the evaluation system more objective.

4. How to achieve the application of Blockchain technology into high education evaluation

Referring to the architecture of blockchain, this paper constructs an education evaluation model based on blockchain to form a paradigm system of education evaluation system and data fusion, as shown in Figure 1.



(1) Constructing education evaluation alliance chain

Educational evaluation adopts the evaluation mode of alliance chain. The chain mainly includes alliance nodes such as education administrative departments, participating universities, third-party evaluation units and the public. The whole transaction process is jointly managed by these nodes to realize the alliance model of cross agency, cross department and cross field. All information and data can be authenticated, recorded, verified and stored on the chain.

(2) Construction of Education Evaluation Database

After the evaluation task is assigned, the education administrative department authorizes the universities that meet the application conditions. The authorized participating universities can join the alliance chain and report all kinds of evaluation data. All reported data shall be recognized by the consensus mechanism, so as to ensure the accuracy and objectivity of the data and build the database required for the evaluation.

(3) Development of evaluation indicators to form a smart contract

When the evaluation starts, the evaluation experts, evaluation institutions, participating units, education administrative departments and other nodes reach a consensus on the evaluation indicators to form a smart contract. As long as the information of the participating units meets the standard of smart contract, it will automatically trigger the recording of data into the blockchain, omitting the filling and declaration process of traditional participating units, and ensuring data security.

(4) Evaluation link

After receiving the evaluation information, the evaluation unit will push the data to the evaluation experts. The evaluation experts can adopt online or offline evaluation methods, or add on-site investigation links as needed to finally form the evaluation results and upload them to the blockchain. The evaluated units, education administrative departments and society can access the evaluation results, ensure the timeliness of evaluation feedback and save the time loss of education decision-making, plan implementation and subordinates, Improve the overall management efficiency and quality.

(5) Supervision process

The education administrative departments play a regulatory role in the whole evaluation process. The participation of any node needs to be authorized by the education administrative department to prevent joint fraud by members of the blockchain and ensure the normal operation of the evaluation. At the same time, it is also restricted by the public. Authorized public nodes can access the whole education evaluation process through the blockchain to ensure the fairness of the education evaluation process.

5. Direction of future research

With the continuous development of blockchain technology, the corresponding system guarantee and legal system construction also need to be supplemented and improved in time, and the supervision mode needs to be strengthened. [3] Meanwhile, with the increasing application of blockchain technology in the field of education evaluation, how to communicate, data exchange and data sharing between different blockchains will be the problem to be faced in the future [4]. How to provide appropriate algorithms, technologies and interfaces to ensure query speed is also the direction to be further studied in the future.

6. Conclusion

As an emerging Internet technology, blockchain technology will bring profound changes in the concept and technology of educational evaluation governance, which can significantly improve the actual effectiveness of educational evaluation governance in the new era. In the future, it is also necessary to increase the research investment of blockchain technology in educational evaluation governance, improve its operability in practical evaluation work, and inject advanced power of emerging technologies into the modernization of educational evaluation governance in China.

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Online Quality Education in Pakistan: Opportunities and Challenges pre and post Pandemic

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Abstract

The essential objective of this study is to scrutinize quality of virtual teaching of student because of COVID-19 and after pandemic. Throughout start of FY 2020 the effect of corona disease pandemic on tutelage of the globe. HEI's of Pakistan was closed too on the notice of management in march 2020 so in this study researcher want to emphasized some issues which are supportive e-education and some challenges encountered by learners and satisfaction of students on quality of education during pandemic and post pandemic. Investigators use survey for gathering of prime data form diverse 1000 scholars of six diverse HEI's in Sindh. Afterward enquiry of data consequences is meaningfully impacting quality of virtual education.

Keywords: Quality Education, Opportunities, Challenges, pre and post pandemic

1. Overview

An influence of the virus on country's economy, society and education due to lockdown of different major cities all over the Pakistan and in world (Shafi, Liu, & Ren, 2020). So no one can move from one side of the glob to other side and locally as well this cause economical break down and educational transformation from face to face teaching to on line teaching. An Education is essential for life of each and every human in the world. It is disturbed due to corona virus pandemic 2020, according to Merriam-Webster dictionary word "pandemic means" "an outbreak of a disease that occurs over a wide geographic area and affects an exceptionally high proportion of the population" because WHO announced COVID-19 (WHO, 2020) is threat to all civilizations around the globe in this study narrated (Adedoyin & Soykan, 2020; Kopp, Gröblinger, & Adams, 2019). So, government of Pakistan also announced corona virus pandemic in beginning of March 2020, so all economic activities were shut down as well as educational institutions (Toquero, 2020) On the day of 06 April 2020 UNESCO conveyed that approximately 1.576 billion students were affected out total and in term of percentage it is 91.3% all around the globe, because of this millions of student in Pakistan had faced this problem in education and at the same time thousand school Teachers or faculty members faced problem of technological awareness, so they were lose their job because of less skilled of technology. HEC committee announce new academic policy for online education this was very good decision taken by them because psychological impact of COVID-19 on humanity especially on students was very bad so due to online classes student get benefitted in mental health and in educational aspect. Moreover, HEI's was working for solutions for that specific problem with maintenance of SOP's of social distancing they trained their faculty member with different E-learning tool because previously majority of HEI's was not offering distance learning programs in their institutes except Virtual university of Pakistan, "Allama Iqbal Open university of Pakistan" (Bughio, Abro, & Rashdi, 2014) and some other. So, after training gotten by faculty members were conducting class form their homes and this is an opportunity for those Faculty members who are equipped with technology (Khalili, 2020; Hrehova, 2019), Moreover, researcher said education is a procedure that

greatest happens within a societal setting that includes collaborations and sharing of individual practices and interpretations with other persons in a group (Newman & Holzman, 2014). Moreover, HEC committee announce another new academic policy for online education and hybrid mode of teaching this was very good decision taken by them because mental impact of COVID-19 on civilization especially on students was very bad so due to online classes and hybrid mode reduces the mental impact COVID-19 and student get benefitted in psychological health and in educational aspect.

2. Reviewing the literature

An effect of COVID-19 on HEIs and IPE plans remains into the future determined, given the changeable and quickly varying nature of the COVID-19 pandemic. This doubt makes any scheduling unsure, however this is unblemished that due to COVID-19 is moving in the new way of life, jobs and education. The way of delivery of teaching like via online and distance learning in the globe and in Pakistan is new normal (Khalili, 2020, pp. 1-4).

Several studies on narrated that in developing countries online education become challenge as online readiness of higher education university in all over the globe and Pakistan as well (Farooq, Rathore, & Mansoor, 2020). The big challenge is transformation of education from traditional to e-learning in different educational institutes according to their speciation such as medical, engineering, social sciences and Business management (Leszczyński, et al., 2018). Moreover, Majorities of HEI's were not prepared for online education due to COVID-19 pandemic in Pakistan (Farooq, Rathore, & Mansoor, 2020). Several institutions start their online classes after announcement online educational Policy by HEC Pakistan during pandemic. Moreover, Institutes do not have smart, efficient and effective IT department staff and some faculty members which have IT adoption problems as well. Researcher want to identify some challenge and opportunities highlighted in this study.

3. Challenges and Opportunities for Institutes (Faculty)

Some challenges were highlighted in studies that were effect online education 1st lack of trained staff and faculty members cause mismanagement and misuse of IT, 2nd partial capacity building of faculty members and IT department staff and 3rd limited finance available for training, development and infrastructures (Bughio, Abro, & Rashdi, 2014; Smedley, 2010; Sepulveda-Escobar & Morrison, 2020). But Scholar highlighted that these same problems are still in developing countries again rises during pandemic 2020 (Khatai & Bhatta, 2020). Moreover, researchers narrated that less expertise of faculty members with use of IT, no eye contact (Mahmood, 2020, p. 2) with student is another problem and from home students are also disturbing class lectures due to pandemic, relax assessment procedures adopted by institutes effect the quality of education. On other hand opportunities for faculty are flexible timing for and no traveling cost, less gestures and dressing requirement, recorded lecture are also available for student if any student need additional time faculty can share it with student (Khatai & Bhatta, 2020; Mahmood, 2020). Moreover, due hybrid mode of teaching some faculty member face problem in managing students in class and online at same time. Research highlighted that the impact of COVID-19 on higher education with performance of student grade in different courses with online and face to face learning method (Said, 2021) so, faculty has faced problem in assessment as well in our region.

4. Challenges and opportunity for Students

Majority of Pakistani student are coming from rural and backward areas to urban HEIs having several problems (Mahmood, 2020). several studies suggest that transformation of traditional teaching method to online teaching method due to COVID-19 pandemic several issue arises for students such as technology adaption students were facing problem in downloading lectures and uploading assessment on time and through proper channel, low internet connectivity another problem faced by them is internet speed in their areas such as rural areas of Sindh, Baluchistan, and all other province of Pakistan (Mailizar, Almanthari, Maulina, & Bruce, 2020; Adnan & Anwar, 2020). less interactive class in traditional class eye contact and Q&A was easily taken to end but due to online class no eye contact no frequent Q&A was done, unavailability of laptops, computers, and advance cellular phones due to middle class and lower middle class student in private Institutes so unable to purchase laptops by each and every students (Khatai & Bhatta, 2020, p. 47), Moreover, another problems in Pakistan is electricity in different areas during classes timing so student unable to attend the classes so low attendance in class, researcher highlighted that (Mahmood, 2020, p. 3), student taking classes for their home due to pandemic all family members are in home, so younger children and infant are disturbing to elders during class timing (Sepulveda-Escobar & Morrison, 2020; Adnan & Anwar, 2020). Due to unexpected transformation in education to e-learning in Pakistan during March 2020 student face different problem like weak student get help from good students they meet do combine studies and improve their skills but due to pandemic they were unable to get together for combine studies less interaction lead Psychotically issue of stress and anxiety. In online classes student does not take interest and not listen to instructors seriously, course content is not easily possible to complete due to online classes. Real time idea sharing and engagement with course content is difficult to understand by students. Another study also highlighted that some similar challenges such as technical difficulty, access to computer and computer literacy, need for face-to-face interaction, level of awareness, competency of English language, resistance to change, student assistance, and privacy & security that are affecting quality of e-learning said by (Qureshi, Ilyas, Yasmin, & Whitty, 2012). Research highlighted that the impact of COVID-19 on higher education with performance of student grade in different courses with online and face to face learning method (Said, 2021) so, Student had enjoyed that benefit.

5. Methodology:

The research is explanatory in the nature and random sampling technique would be used to collect data. Responses of COVID-19 During beginning of FY 2020 the impact of corona virus pandemic on education of the world and target population is undergraduates and graduates' students of various universities of Sindh has been collected through close-ended questionnaire. Our target population is 6 difference universities and degree awarding institutions namely KASBIT, IQRA, IBA department of university of Sindh, Shah latif University Khairpur, SZABLU, BBUS Nawabshah in Sindh and 1000 sample size are chosen for this research out of 600 responses have been gathered from the overall sample. Collected data was analyzed by the help of using statistical software Smartpls 3.3.2. Result is generated by doing Reliability test for data with Cronbach's Alpha and One-Sample T test analysis.

6. Research Model

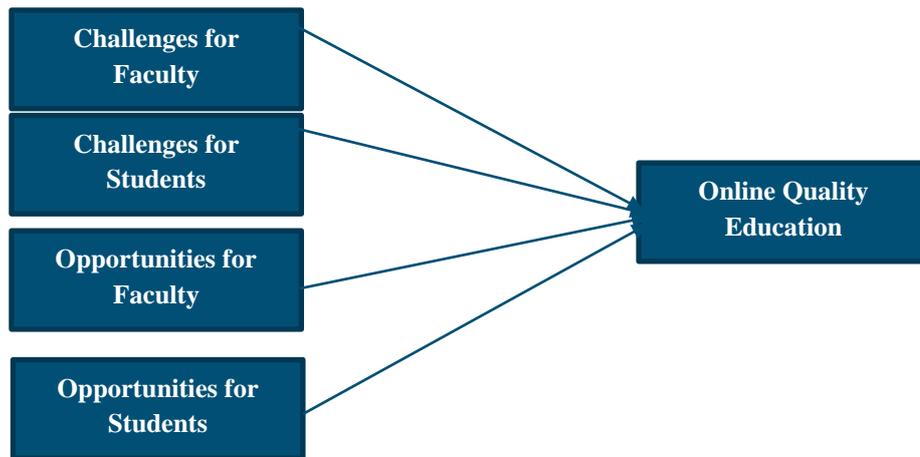


Figure 3: Model of the Research

7. Results

Reliability test result depending on several criteria's such as Cronbach's Alpha, Rho_A, Composite Reliability and validity test result depending on several criteria's such as Average Variance Extracted (AVE), Fornell-Larcker Criterion. For Cronbach's Alpha suggested values are “ $> .9$ – Excellent, $> .8$ – Good, $> .7$ – Acceptable, $> .6$ – Questionable, $> .5$ – Poor, and $< .5$ – Unacceptable” (p. 231) are given by George and Mallery and cited by (Gliem & Gliem, 2003).

Reliability and Validity

	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
CF	0.889	0.899	0.923	0.750
CS	0.763	0.844	0.849	0.556
OF	0.880	0.885	0.917	0.736
OS	0.814	0.883	0.876	0.643

Table 1: Test results of Reliability and Validity

Researchers initiate the outcomes analyze with reliability of replies of data in given above Table no.1, all ranges of reliabilities and validities recommended by (Hair, Risher, Sarstedt, & Ringle, 2019) are all acceptable in range so data is reliable.

Fornell-Larcker Criterion

	CF	CS	OF	OS
CF	0.866			
CS	0.042	0.746		
OF	0.138	0.046	0.858	
OS	0.051	0.252	0.036	0.802

Table 2: Fornell-Larcker Criterion

Alternative vital and suggested validity test for study is “Discriminant validity”. The values of this criterion is all diagonal values are greater than all non-diagonal values & in above table no. 2 all standards meets the conditions suggested by (Fornell & Larcker, 1981) so, data has no validity issue.

Coefficient of Correlation

After checking different criteria’s reliabilities and validities of data nets to check R^2 and adjusted R^2 values In table no. 3 given below it encloses the data associated to R^2 and adjusted R^2 , the range of R^2 is “0 to 1 and above 0.25 is moderate” suggested by (Hair, Risher, Sarstedt, & Ringle, 2019) and all valves of R^2 and adjusted R^2 are above 0.25 it means all indicators of online education are explain more 50% variance between IVs and DV.

	R Square	R Square Adjusted
CF	0.600	0.589
CS	0.501	0.481
OF	0.630	0.590
OS	0.860	0.860

Table 3: Coefficient of Correlation

The mention above table no. 4 “bootstrapping path coefficients” has revealed values of sample mean, original sample, T values, P statistics, and standard deviation. The important standard satisfactory values of T statistics is more than 2 and P value essential be fewer than 0.05 (Hair, Risher, Sarstedt, & Ringle, 2019) and all valve of T and value P are in acceptable range it means challenges of faculty and student has impact on online education and opportunities of faculty and student has positive impact on online education.

Bootstrapping Results.

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics ((O-STDEV)/STDEV)	P Values
CF -> OQE	0.308	0.309	0.051	6.089	0.000
CS -> OQE	0.280	0.282	0.063	4.429	0.000
OF -> OQE	0.252	0.276	0.099	2.553	0.011
OS -> OQE	0.993	0.991	0.005	8.241	0.000

Table 4: Bootstrapping path coefficients

8. Conclusion

According to result all Significance values of all variables that are less than 0.05 so researcher said that technical difficulty, access to computer and computer literacy, need for face to face interaction, level of awareness, competency of English language, resistance to change, student assistance, and privacy & security are major challenge in developing country.

Although it became opportunity as well, because after awareness of digital platform faculty are able to share their knowledge and skills globally without any resist and obstacles. Moreover, it minimizes the geographical boundaries to share their knowledge among the entire world.

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Problems and Countermeasures of Chinese-Foreign Cooperative Education during COVID-19 Pandemic

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Abstract

The COVID-19 pandemic that is prevalent all over the world, has had a tremendous impact on global economic and social development, and has caused great obstacles to educational exchanges and cooperation. As an important way to realize the internationalization of higher education, Chinese-foreign cooperative education has been developing vigorously in recent years, which now is facing unprecedented challenges and embracing new opportunities under the pandemic. In this context, most Chinese-foreign cooperative education projects choose online teaching as the main approach to deliver courses. This paper analyzes the problems that emerged in the process of Chinese-foreign cooperative education during the pandemic, mainly including: 1) the inability of teachers of foreign colleges and universities to come to the offline class in China for teaching; 2) the lack of learning experience in foreign cooperative institutions for Chinese teachers and students who are unable to go abroad; 3) the difficulties in course arrangement and management in online teaching. This situation will not be alleviated in the short term as the number of confirmed cases increasingly rises globally. Therefore, this paper puts forward three solutions: 1) enriching high-quality online education resources; 2) improving students' learning experience; 3) innovating course designs and improving teaching management, aiming at further optimizing the Chinese-foreign cooperative education and promoting the internationalization of China's higher education. \

Key words: Chinese-foreign cooperative education; COVID-19 pandemic; online teaching

With the further development of economic globalization, the internationalization of higher education has become the new trend around the world, and China's higher education has also actively gone global. In this context, Chinese-foreign cooperative education has become an increasingly important part of higher education during the development of around 40 years since its inception in 1980s. With wider scope, broader field and higher level, this education mode has received higher acceptance and more participants among parents and students. Through cooperation, Chinese-foreign cooperative education enables Chinese and foreign education providers make full use of each other's strengths, which plays a positive role in promoting the opening-up of China's education, the reform of higher education, the international development of colleges and universities, and the broadening of talent cultivation, especially for colleges and universities with industrial characteristics. Chinese and foreign education not only serves as an important way to introduce high-quality educational resources, facilitate humanistic exchanges between China and foreign countries and cultivate comprehensive international talents, but also a powerful combination that can give full play to the advantages of professional characteristics of both sides and drive the development of higher education and the construction of "double first-class" (first-class universities and disciplines of the world) in China.

However, just as Chinese-foreign cooperative education is in a critical period of improving quality and efficiency and enhancing the ability to serve the overall development in the new era, the COVID-19 pandemic has brought a serious impact to the international community as well as internationalization of education. Countries around the world are facing unprecedented economic

crisis while the preventions in some countries fail to control the pandemic, leading to the spread of unilateralism, populism and anti-globalization. At the same time, affected by the COVID-19, studying abroad is unable to achieve in a short term due to the closed visa channel, tightened international flights, and stopped on-site teaching, resulting in the obstruction of education internationalization. Undergoing changes unseen in a century and the pandemic, Chinese-foreign cooperative education is facing unprecedented opportunities and challenges.

1. Current Situation of Chinese-foreign Cooperative Education

As of June 2021, a total of 2,282 Chinese-foreign cooperative education projects and institutions have been approved by the Ministry of Education and provincial education administrative departments, among which above undergraduate stage includes 9 independent legal institutions, 219 non-independent legal institutions, and 1,065 Chinese-foreign cooperative education projects. Since 2015, the Ministry of Education has approved and filed a total of 580 institutions and projects of Chinese-foreign cooperative education providers, consisting of 7 independent legal institutions, 84 non-independent legal institutions and 489 projects. At present, the scale of students enrolled in Chinese-foreign cooperative education reaches 600,000, including about 550,000 students in higher education. More than 2 million students have graduated from cooperative education. On the whole, the institutions and projects of Chinese-foreign cooperative education in higher education (including specialties) account for about 90% of the total number of institutions and projects, involving more than 200 majors in 11 disciplines and covering 36 countries and regions with more than 800 foreign colleges and universities and more than 700 in China^[1].

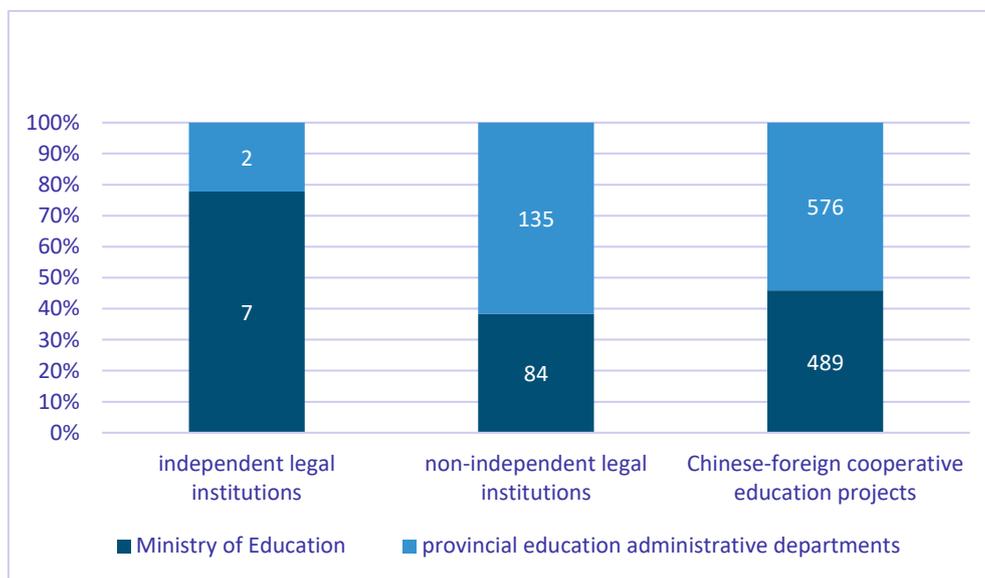


Table 1 Current Situation of Chinese-foreign Cooperative Education

With the continuous advancement of Chinese-foreign cooperative education, it has gradually changed from the original "extensive" development of expanding scale to the "connotative" development of improving quality.

2. Problems of Chinese-foreign Cooperative Education during COVID-19 Pandemic

The sudden outbreak and spread of COVID-19 pandemic has caused various problems for Chinese-foreign cooperative education, such as the inability of teachers of foreign colleges and universities to

give lectures in China, the difficulties of Chinese teachers and students to take on-site courses in foreign countries and the problems of the management of online courses.

2.1 Inability to Teach Offline for Foreign Teachers

According to *Opinions of the Ministry of Education on several issues concerning the current Chinese-foreign cooperative education* issued in 2006, it is clearly stated that the number of professional core courses and teaching hours undertaken by teachers from foreign educational institutions shall account for more than one-third of all courses and teaching hours of Chinese-foreign cooperative education programs, and the lectures shall be given face to face in accordance with the teaching rules. However, most of foreign teachers are unable to come to China during the COVID-19 pandemic. Instead, they have to teach online. Moreover, the differences in hardware conditions and teaching requirements of different majors among institutions and programs lead to many problems in the online teaching, which has a direct impact on the teaching quality of Chinese-foreign cooperative education. In the annual reports of Chinese-foreign cooperative education providers, a number of foreign institutions indicated that the course pass rate decreased compared to that before the pandemic. This paper conducted a statistical survey of foreign teachers in seven Chinese-foreign cooperative institutions and 54 projects in Shanghai that participated in this year's education evaluation. The results showed that from 2019 to 2021, a total of 2,630 foreign teachers participated in Chinese-foreign cooperative education, of which 1,743 foreign teachers adopted online teaching method, accounting for 66.27%.

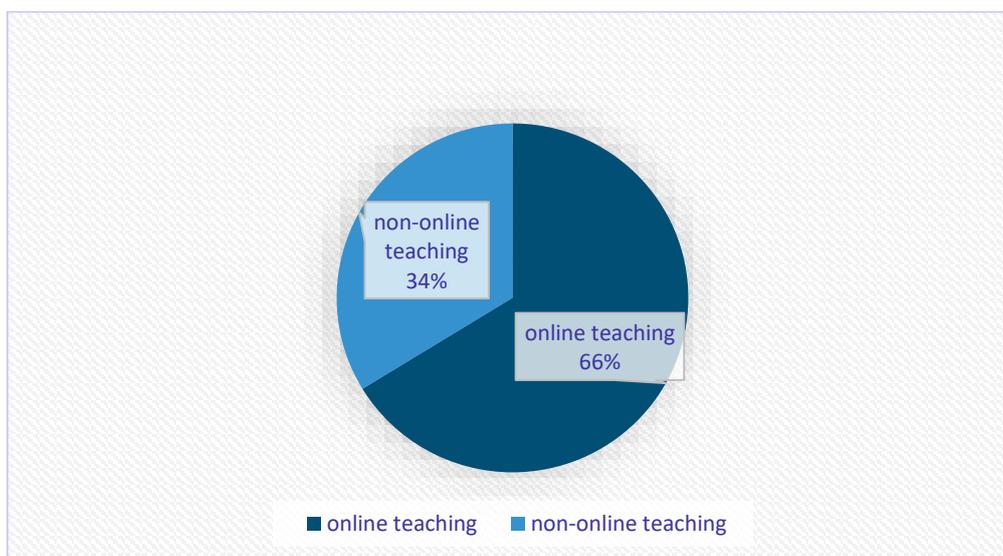


Table 2 Teaching method of Chinese-foreign cooperative education from 2019 to 2021

2.2. Difficulties in Studying Abroad for Chinese Teachers and Students

The purpose of conducting Chinese-foreign cooperative education is to learn from the international advanced education concepts and management experience, improve school management ability, promote the quality of talent cultivation, and enhance teaching and research level. The outbreak of the pandemic has disrupted the plans of students and teachers to exchange and study in foreign cooperative colleges and universities. For example, in undergraduate stage of Chinese-foreign cooperative education, some students who participate in “2+2” or “3+1” projects cannot go to foreign colleges and universities as planned. However, it is explicitly stated in agreement of some cooperative projects that students shall get enough credits as required by foreign colleges and universities before they can obtain the foreign diploma, which requires timely communication between Chinese and

foreign cooperative institutions to formulate countermeasures. Similarly, to improve teachers' education and teaching, the Chinese colleges and universities send teachers abroad for exchange every year. At present only online training is available due to the pandemic. But the online learning experience is not comparable to offline class learning for the lack of face to face communication and interaction.

2.3. Problems of Course Arrangement and Teaching Management

Most Chinese-foreign cooperative education providers adopted online education for student study and teacher training due to the pandemic. It is admitted that online courses have some advantages, such as can be watched repeatedly through the screen recording, be unlimited by space and time, meet diversified needs and planning study and practice more freely. But its disadvantages seem more obvious. For curriculum arrangement, online education is not suitable for all courses. Some courses are easy to teach only while others are relatively difficult, such as those have a high requirement for practice or are hard for student to understand. For teaching management, the unbalanced development of information technology in different regions and various online teaching platforms may have an impact on the effect and quality of teaching. Thus, it's hard for teachers adopted online teaching to timely interact with or get response from students, making it difficult to adjust teaching content and pace or meet teaching requirements.

3. Countermeasures for Quality Assurance of Chinese-foreign Cooperative Education during COVID-19 Pandemic

As countries around the world take prevention and control measures against COVID-19, the flow of personnel is greatly restricted. Chinese-foreign cooperative education, which is characterized by the exchange of Chinese and foreign personnel, is undoubtedly confronted with greater challenges. It is necessary for relevant colleges and universities to take effective measures and innovative methods in education, teaching and management to better deal with the practical difficulties caused during the pandemic.

3.1 Enriching High-Quality Online Education Resources

The educational and teaching activities of Chinese-foreign cooperative education are mainly conducted face-to-face under regular circumstances, supplemented by online teaching and tutoring. In the case of pandemic, as the flow of teaching staff is restricted, especially teachers from overseas educational institutions find it difficult to come to China to carry out educational and teaching activities, the introduction of courses to be taught online has become an inevitable choice. To deal with this problem, Chinese university H and its cooperative foreign university jointly developed courses based on the characteristics of online teaching to ensure that the teaching quality and level are the same as the face-to-face courses taught by foreign teachers. University H also upgraded and improved the distance teaching equipment, helped foreign teachers get familiar with the use of online teaching tools and platforms in advance through online training, workshops and one-to-one consultation and adapted platform function to realize foreign teachers' personalized teaching needs. Moreover, university H also shared its experience with many world-class higher education colleges and universities to help them develop their own online courses. Therefore, schools of Chinese-foreign cooperative education shall take the construction of high-quality and rich online curriculum resources as a core task in the current education and teaching process. On the basis of the enrichment of online high-quality educational resources and the improvement of educational resource service platform,

the online platform shall be used to share high-quality curriculum resources of Chinese-foreign cooperative education, benefiting more colleges and universities involved.

3.2 Improving Learning Experience

Since online education is inevitable during pandemic, Chinese-foreign cooperative education providers shall pay more attention to the learning experience of students in accordance with their needs. For example, university H creatively restores offline lecture scenarios to create an immersive and interactive classroom experience. Teachers at University H actively adjust and optimize the course design, shorten the time of individual lectures, and use different forms of interactive sessions, such as group discussions, forum presentations, group reports, etc., to enliven the classroom atmosphere and ensure students' concentration. University N set up QQ group or WeChat group for each online course, in which students, counselors and teaching administrators were all included, to facilitate the communication and coordination of online education. In order to ensure the teaching quality, University N organized 9 online teacher-student exchanges and seminars, and fully investigated students' satisfaction and demands for online courses through questionnaires, individual talks and other forms, and paid continuous attention to all kinds of difficulties and problems and offered timely solutions. To sum up, Chinese-foreign cooperative education providers shall conduct research on the technology and teaching methods of online courses through a series of digital teaching tools that deeply integrate technology and teaching, striving to make online courses have the same experience as face-to-face ones. They shall also know the attendance and performance, problems and challenges as well as demands of students and give timely responses and adjust teaching methods, in order to improve teaching effectiveness.

3.3 Innovating Course Designs and Improving Teaching Management

The COVID-19 pandemic has brought negative impacts and great challenges on Chinese-foreign cooperative education, especially in course arrangement and teaching management. In order to overcome negative impacts, make a smooth transition and orderly connection between online and offline teaching, and ensure the quality of online teaching, University N actively unleash creativity in teaching methods, course design, teaching tools. For example, in art courses that are highly practical, instructors use a variety of technical means to demonstrate the creation process and reconduct the offline class scenes from multiple dimensions in an original way. A series of online activities such as academic and career counseling, information quality education, and mental health counseling were carried out in an innovative way to assist in the conduct of cooperative education. University N also established a feedback mechanism for monitoring the quality of teaching and learning, following a daily "summary-feedback-solution" closed-loop system, to grasp the actual teaching needs of teachers and students at anytime and anywhere, fully realize online teaching collaboration, and ensure the overall teaching quality of the project. In conclusion, Chinese and foreign cooperative education providers shall strengthen communication and adjust teaching contents on the basis of pandemic situation and course characteristics. In the way, teachers can select appropriate teaching methods and approaches to conduct educational activities. At the same time, both Chinese and foreign colleges and universities shall consider the impact of the change of education mode on students under the pandemic, and further update and improve the methods and means to carry out education quality assurance work, better serving the quality improvement of cooperative education.

4. Conclusion

The ongoing pandemic has profoundly changed the way people work and live, as well as the mode of education. Colleges and universities have generally launched online teaching to tackle the hard situation. The pandemic has greatly accelerated the integration of online and offline teaching. Although the COVID-19 pandemic has been effectively controlled in China, it still has long-lasting affects and the prevention and control of the pandemic has been normalized. Thus, the response measures and methods proposed during the pandemic to solving emerged new problems are of positive significance to improve the quality and level of online teaching of foreign courses in the context of the normalization of pandemic prevention and control, ensure the promotion of Chinese-foreign cooperative education projects, benefit the cooperative education process of other colleges and universities, and deepen and expand the mutually beneficial cooperation and exchange with other countries in the world.

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Program Review of Macao Higher Education Characterized by OBE -Based on the Guidelines

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Abstract

Macao higher education quality assurance has formed a relatively complete quality review system, among which the program review is a major feature. Based on the Guidelines on Program Review of Higher Education Quality Evaluation of Macao issued by Higher Education Bureau of Macao Special Administrative Region in April, 2020, this paper introduces the criteria, procedures and methods of program review. It is concluded that Macao higher education program review has the characteristics of outcome-based, combination of quality assurance and quality improvement, strong subjective consciousness. It is hoped that we can find some references from it to optimize the curriculum evaluation system of higher education in Chinese mainland.

Keywords: Curriculum evaluation, Macao higher education, Quality assurance, PRG

In 1999, Macao returned to China from Portugal. In the past 20 years, Macao higher education has continuously learned from the international advanced experience and formed a pattern of diversification running schools. In terms of quality assurance, Macao higher education has always pursued high-quality education with an active attitude, and actively expanded various external evaluation methods to promote both internal and external education quality assurance, thus it has established an effective internal and external education quality assurance system. Based on the "Guidelines on Program Review of Higher Education Quality Evaluation of Macao"(PRG), this paper analyzes the program review(PR) in Macao higher education quality assurance system in an all-round way, aiming at introducing the program review guidelines of Macao higher education and their characteristics, and finding out what can be used for reference in order to optimize the curriculum evaluation system of higher education in Chinese mainland.

1. Introduction of Quality Assurance of Macao Higher Education.

Since the reunification, the quality assurance of Macao higher education has four stages: continuous development--diversified expansion--international recognition--institutional transformation. Macao higher education has been attached importance to the Higher Education Bureau (DSES) for a long time. In 2017, the new *Higher Education System* law was promulgated, and a series of laws and regulations including *Higher Education Quality Evaluation System* were promulgated, which marked the establishment of Macao higher education quality assurance system. ¹⁷Evaluation in Macao (Figure 1.) is categorized into two levels: Institutional Evaluation and Program Evaluation, each of which is further classified into two types, namely Institutional Accreditation (IA) and Program Accreditation (PA), Institutional Quality Audit (IQA) and Program Review (PR) respectively. IA and PA belong to summative value judgments, and the certification results includes "pass", "conditionally pass" and "fail". Each higher education institution (HEI) chooses whether to participate in IA according to its actual situation; PA is aimed at newly opened or greatly changed programs. IQA belongs to a formative value judgment, which aims to evaluate the operation of HEI, and know more

about their advantages and disadvantages to find space for improvement; PR is a formative evaluation, which diagnoses the problems existing in institutions and programs according to relevant standards, and improves them to ensure the continuous improvement of the program quality of Macao. Because of the different expression habits of languages, people of Chinese mainland generally understand "program review" as "curriculum evaluation", so Macao's "*Guidelines on Program Review*" can be understood as a guide for curriculum evaluation.

In order to ensure that program quality sustainably improves, and that programs are up-to-date and can meet stakeholders' needs, the Higher Education Bureau Government of Macao Special Administrative Region has promulgated *the Guidelines on Program Review, Guidelines for External Quality Assurance Agencies, Guidelines for program accreditation, Guidelines for Institutional Accreditation and Guidelines for Institutional Quality Audit*. Among them, PRG expounds the areas, requirements, criteria and procedures of program review(PR), which provides a basis for the PR of the HEI.

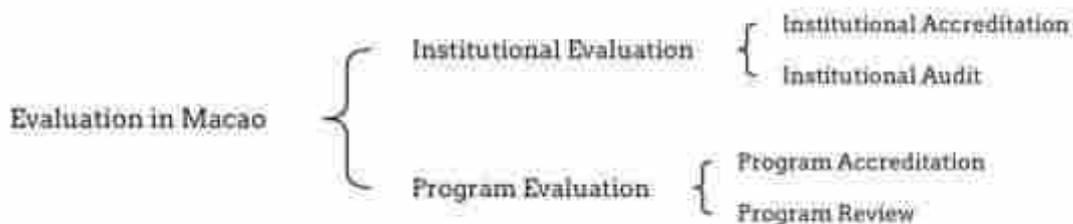


Figure 1. Hierarchical diagram of Macao higher education quality evaluation system

Source: Article 37, Chapter 7, *Higher Education System*

2. Higher Education Program Review of Macao

PR is one of the methods to evaluate the quality of Macao higher education. As a detailed guide text, PRG has clear instructions and detailed appendix explanations on guiding principles, areas, requirements, criteria, applications, procedure, outcomes, follow-up action and observers. This normative text provides systematic and standardized operational guidance for the HEI in Macao, and it enables the quality of Macao higher education be steadily on the increase.

2.1. Program Review Criteria

There are 3 first-class indicators, 9 second-class indicators and 32 observation points as the program review criteria, which mainly include three aspects: Program, Resources and Support, Internal Quality Assurance of Program (Table 1).

Key indicators (Level 1)	Indicator (Level 2)	Point of Observation
	Program Objectives and Intended Learning Outcomes	

Program	Admission Requirements and Selection Process	32 Points of Observation (omitted)
	Program Structure and Content	
	Teaching and Learning	
	Assessment	
Resources and Support.	Academic Leadership and Teaching and Research Team	
	Learning Environment, Resources and Support	
Internal Quality Assurance of Program	Program Development, Management, Monitoring and Review	
	Partner Selection, Management, Monitoring and Review (if applicable)	

Table 1. Program Review Criteria

Source: Guidelines on Program Review of Higher Education Quality Evaluation of Macao, April 2020, P14-18.

2.1.1. Program

As the focus of PR, PRG puts forward clear requirements for program. Firstly, the program has to follow the outcome-based approach in design and delivery so as to meet the quality assurance requirements of Macao. Secondly, program plan and design have to be in line with the HEI's academic development, taking into account its competence and capacity, so that program reflects the HEI's educational philosophy and goals.

(1) **Program Objectives and Intended Learning Outcomes:** clear and coordinate
The program objectives must be aligned with the HEI's vision and educational purposes. Program objectives and the intended learning outcomes must be specific and go hand in hand with each other, and continue to be in line with the HEI's academic development plan. And the HEI should clearly understand the abilities that students are expected to acquire in the future. If professional certification is involved, the program should meet the requirements of the profession.

(2) **Admission Requirements and Selection Process:** transparent and flexible
The HEI must clearly define the admission policies, admission procedures and criteria, which are implemented in a consistent, open and transparent manner. The HEI must explicitly state the requirements for the program enrollment. If there is any special admission policy, it must

comply with Macao's laws and regulations. The responsible staff must clearly understand and abide by the admission requirements and selection procedures, and make contingency plans at any time according to the admission situation.

(3) Program Structure and Content: results-based and normal

Program structure and content emphasize highlighting students' learning achievements, for example, the program design should meet its stated objectives and the intended learning outcomes, and it provides students with both academic knowledge and skills, including those that are transferable, which may influence their personal development and may be applied in their future career life. Besides, the structure and content of program are subject to a formal institutional approval process. If HEI has a credit system, the credits and the proportion of courses should be reasonable and appropriate.

(4) Teaching and Learning: student-oriented

The HEI should ensure that the program is delivered based on a "student-centered" guiding approach that stimulates students' motivation, self-reflection and participation in the learning process. During the program, students should be the center to stimulate students' initiative and evaluate the program regularly to promote students' personalized development. If students have an practicum and workplace attachment, the academic unit should provide them with clear and accurate information, as well as reliable and quality practicum and workplace attachment, and support to promote the internship process smoothly.

(5) Assessment: equal and goal-oriented

All students should be treated equally in the assessment process, and the academic unit should elaborate in detail the program's assessment strategies and arrangements. The assessment must be based on the principle of constructive alignment, through which the moderation mechanism helps to ensure fairness, consistency and effectiveness in reflecting the standard of student attainment. The assessment should reflect whether the intended course objectives or the proposed learning results have been achieved, and assessors are required to be familiar with existing testing and examination methods. The academic unit should provide assessors with support for the development of their skills in this field.

2.1.2. Resources and support

Educational resources such as manpower, material resources and financial resources consumed in the process of education are the basis of education development. DSES attaches great importance to the resources and support provided by HEI for students. The HEI must provide sufficient and appropriate teaching and learning resources and learning environment to facilitate effective learning. Qualified academic leaders must effectively lead the teaching and research team to develop and operate a quality program and to engage in research activities. The HEI and the academic unit must provide adequate and appropriate academic counseling and other support services to students to ensure their well-being so that students can, under reasonable circumstances, complete the program and attain the intended learning outcomes.

(1) Academic Leadership and Teaching and Research Teams: professional and strict

Academic leaders appointed by the HEI must be in a full-time position, and possess sufficient academic and professional knowledge in the relevant disciplines or professions. The HEI must have its own academic staff, qualified in the program and adequate in number, complying with the established reference criteria. The academic unit must provide academic staff with performance evaluation procedures to promote its pedagogic and scientific competency and keep abreast of the latest development. The academic unit has to recruit adequate qualified academic staff members for teaching and research activities. There are dynamics for staff development, such as through their continuing study in doctoral and post-doc programs. The program leaders and the academic staff should be able to make suggestions and take actions, which will contribute to the improvement in the effectiveness of the program, thus ensuring that learning outcomes are attained by students, to the monitoring and the review of the program and to the development of team collaboration and adequate communications. The academic unit must embrace appropriate staff structures with adequate qualifications and experience. Performance indicators should help to assess teaching and learning effectiveness. The HEI should encourage teaching and research staff to develop scholarly activities to strengthen the link between education and research and to innovate in teaching methods and the use of new technologies.

(2) Learning Environment, Resources and Support: student-centered and Diversity

The HEI must provide sufficient, appropriate teaching and learning resources, as well as learning environment for students to facilitate effective learning. The needs of a diverse student population, such as mature, part-time, employed and international students as well as students with disabilities, and the shift towards student-centered learning and flexible modes of learning and teaching are taken into account when allocating, planning and providing the learning resources and student support. The academic unit should be well aware of the need to provide adequate and appropriate student support, taking into account the diversity of the student body. There are adequate measures for pedagogical support and other support services during their academic life and for the promotion of their integration in the academic community, such as financing, career and employment counseling. The HEI must be well qualified administrative and support staff with opportunities to develop their competencies. The academic unit must make good use of student learning records to facilitate student learning and serve for academic counseling.

2.1.3 Internal Quality Assurance of Program

It is the responsibility for HEI to ensure the quality of teaching, learning, management, scientific research and social services. The HEI must set up an effective internal QA mechanism to ensure that its program meet the QA requirements of Macao. The HEI must also review its programs regularly for the purpose of continuous enhancement and keeping abreast of the development. If the program involves organizations that provide practicum, internship or activity space, the HEI must have proven mechanisms for partner selection and collaboration. The HEI must regularly monitor and review the effectiveness of the partnership. The internal quality assurance mechanism and decision-making of the HEI should be evidence-based and be informed by regular self-evaluations.

(1) Program Development, Management, Monitoring and Review: feedback and improvement

The HEI must have a policy for the development, management, monitoring and review of the program consistent with relevant laws and regulations of Macao and its internal QA mechanism. All decisions regarding the program must be open and transparent, and made accessible to relevant stakeholders. The HEI should allow qualified teaching and research staff to participate in the definition of program planning, design and development, program structure and content, credits, teaching and learning strategies, modes of teaching and media of instruction. For teaching quality, the academic unit should collect feedback from stakeholders, such as conducting student surveys periodically, and the results of these surveys can be used to guarantee and improve quality. The HEI must provide effective communication channels for students to express their views, appeals and complaints, and allow involvement of external stakeholders who are adequately informed about decisions on the program in internal QA. Improvements resulting from the internal monitoring and approval procedures of the program should be documented. Relevant improvement plans should be recorded. The HEI must periodically review the improvements that the program has ever accomplished as well as their effectiveness since the initial operation of the program or its previous review or accreditation.

(2) (Partner Selection, Management, Monitoring and Review: Strict and regular
The internal QA policy also covers any elements of an HEI's activities that are carried out by other parties that provide practicum, internship or activity space. The appropriate decision-making bodies at the academic unit or program level must be responsible for monitoring the effectiveness of the partnership activities, and periodically review the effectiveness for improvement and for protection of students' interests.

2.2 Review Procedure

According to the relevant regulations of the PRG, the PR mainly consists of three stages: application, process and result.

2.2.1. The First Stage: Application for Program Review

The HEI intending to apply for PR must submit a PR proposal to DSES. DSES will inform the HEI whether it is approved. Upon receipt of DSES's approval of the PR application, the HEI should enter into a service agreement with its engaged external quality assurance agency (EQAA), and must conduct the PR exercise in hand according to the specification in the notification letter from DSES and the evaluation proposal approved by DSES (Figure 2.). The evaluation proposal should include details of the PR exercise, explanation of the engaged EQAA's compliance with relevant requirements, as well as reasons for selecting the EQAA, the budget for evaluation expense, the schedule, the working language in the course of evaluation. HEI has great initiative in choosing EQAA, it can entrust EQAA with excellent achievements and good reputation according to their actual needs.

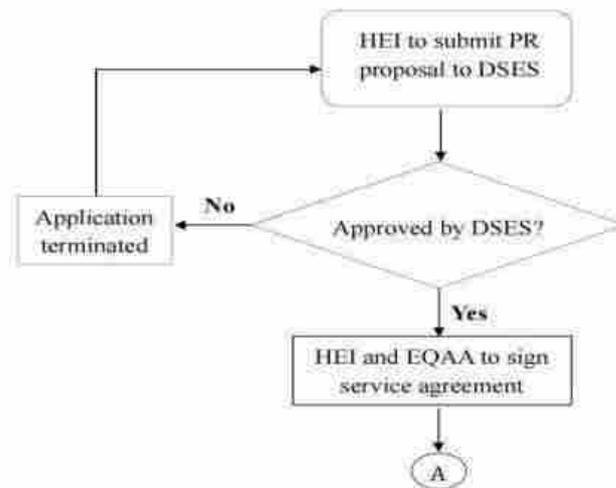


Figure 2. Flow chart of program review application.

Source: Guidelines on Program Review of Higher Education Quality Evaluation of Macao, April 2020, P31.

2.2.2 The Second Stage: the Program Review Process

During the PR, it can be divided into six main links "setting up Panel members-- the HEI submitting self-evaluation document (SED)-- holding the "Program Review Meeting" -- submitting the draft of the report-- feedback from the HEI-- confirmation by DSES"(Figure 3.). After receiving the SED from the HEI, in order to have a better understanding of the evaluated program, the Panel decided on the next work of the evaluated institutions, so it was necessary to hold the "Program Review Meeting" to discuss. So it can be seen that "Program Review Meeting" plays a role of connecting the past with the future in the whole PR process, and it is also an important part in the PR process. First of all, the form of the "Program Review Meeting" is flexible, which is determined by the consultation between the HEI and EQAA. In view that the Panel may come from various parts of the world, the "Program Review Meeting" will generally be held in the most cost-effective means (e.g., via teleconference call, videoconferencing or Skype, etc.). Secondly, the work of the "Program Review Meeting" includes two aspects: one is to review the SED of the evaluated institution, and the other is to judge the review work, that is, to decide the next major work of the HEI. The specific contents of the work are as follows: (1) a request for clarification and/or supplementary information from HEI; and/or (2) meetings/interviews with program leader(s) and/or relevant stakeholders; and/or (3) a site visit. Whether the above three work contents need to be followed up by the HEI depends on the "Program Review Meeting". Finally, after all the necessary work is completed, the EQAA can draft a PR report and send it to the HEI.

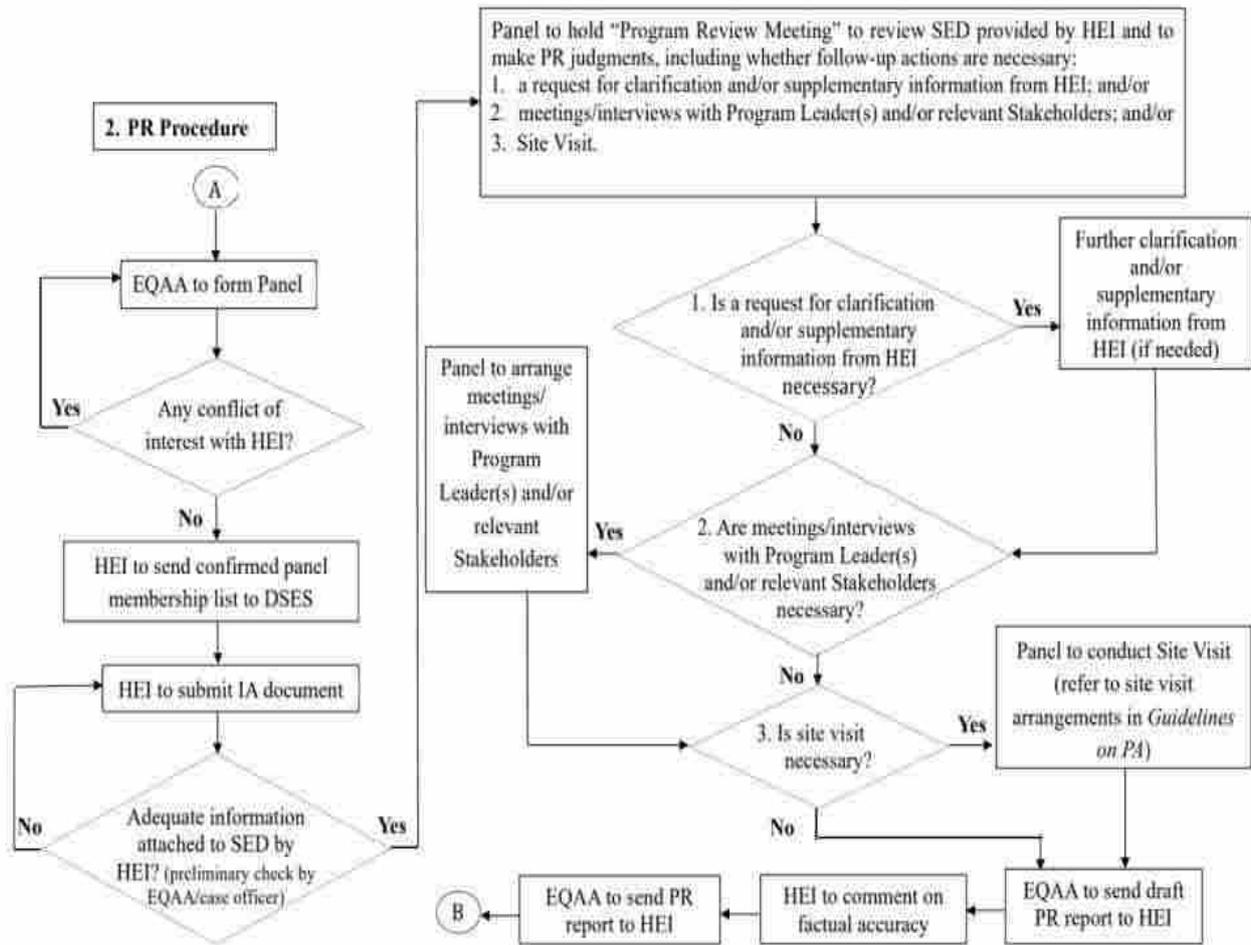


Figure 3. Flow chart of program review process

Source: Guidelines on Program Review of Higher Education Quality Evaluation of Macao, April 2020, P32.

2.2.3 The Third Stage: Outcomes of Program Review.

The outcomes of the PR will be confirmed by the DSES, PR outcomes are to be record in the PR report together with other decisions and respective justifications. Possible PR outcomes include commendations, affirmations and recommendations (Figure 4). The announcement of the outcomes by the DSES does not mean the end of the PR. Within 12 weeks upon receipt of the final PR report, the HEI must formulate an action to address the recommendations stated in the report. The EQAA must comment on and affirm the action plan which the HEI should then submit to DSES for record. DSES may give comments on the action plan. The HEI must include the progress of the areas of improvement prescribed in the aforementioned action plan in its annual report to DSES.

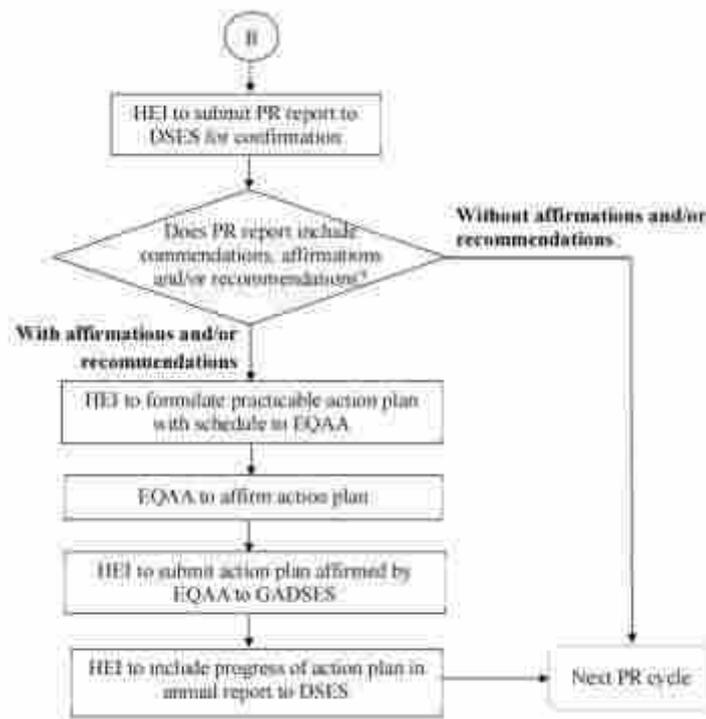


Figure 4. Flow chart of program review results.

Source: Guidelines on Program Review of Higher Education Quality Evaluation of Macao, April 2020, P33.

2.3 Review Method

PR is conducted on the basis of the stated program objectives, intended learning outcomes and criteria under different areas of operation to evaluate the adequacy of the program being reviewed. During the PR process, in accordance with the three operational areas (program, resources and support, internal quality assurance of program), the EQAA must adopt a model that aims to sustain quality enhancement to examine the performance of the program. So, the ADRI mode also runs through the PR. At the beginning, the ADRI mode requires the program to put forward their own development goals or draw up learning outcomes, then take actions and pay attention to the students' actual ability. Finally, the EQAA observe whether the action results achieve the expected.¹⁸The following is the ADRI model applicable to PR:

A: Approach

During the process of PR, the following questions should be formed in mind: What is the purpose of curriculum, the intended learning outcomes and the needs of key stakeholders (including teachers, students, alumni, employers of alumni)? What is the strategy for achieving the program objectives and the intended learning outcomes? What are the measurements of success? etc. At the same time, the following requirements should be implemented when reviewing the curriculum: (1) the program has clearly defined objectives and intended learning outcomes, which are in line with the HEI's academic development plan and educational purposes. Graduates' expected roles and functions are defined as well; (2) admission policies, admission process and standard are implemented in a consistent, open and transparent manner; (3) the HEI should provide pedagogical support and counseling service for students during their academic life and for the promotion of their integration in the

academic community; (4) the program should be based on the relevant laws and regulations of Macao and its internal quality assurance (QA) mechanism.

D: Deployment

When examining the implementation of the curriculum, we should pay attention to the following issues: the degree to what the established strategies, structures and processes by the HEI; the extent to what staff members understand and have embraced the program's approach; how well the strategies, structures and processes have been integrated into the day-to-day operation of the program? Deployment includes two requirements. On the one hand, there is participation of internal and external stakeholders at all levels in planning, designing and reviewing the program. On the other hand, all internal stakeholders are aware of and assume responsibility for QA and engage in internal QA at all levels of the program. Information and feedback are collected and adequately used to improve the program.

R: Results

In the process of reviewing the results of program implementation, we should pay attention to: what are the results of implementation; how to monitor; how to collect relevant data; to what degree are trends of improvement evident in the data. When we need to review the program, we should judge the implementation results of the program from the following two aspects: (1) the effectiveness of the program is demonstrated in terms of performance indicators, student progression and graduation, student satisfaction and feedback from alumni and employers; (2) the program being reviewed and its related curricular units are compared favorably with other programs.

I: Improvement

In order to improve the efficiency of PR and make its form a virtuous circle of "supervision-improvement-supervision", this aspect of review is particularly important. In this process, keeping abreast of what improvements has been made since the initial operation of the program or its previous review or accreditation. This requires regular review of the improvement of the program, open and transparent review process, so that all parties can participate in it. At the same time, it is necessary to provide comprehensive and reliable evidence to prove the continuous enhancement of program quality.

In short, as the main method of PR, ADRI model can not only develop the HEI or program according to the needs, but also highlight the principle of "student-centered".

3. Characteristics of Program Review

3.1. Optimize Review By OBE

The educational theory of OBE, which is widely used in the world at present. It is an effective tool to test the teaching quality. The meaning of OBE is that everything should focus on enabling all students to successfully accomplish something that must be done or have certain abilities at the end of the whole experience in an education system. Compared with the traditional educational theory, OBE pays more attention to students' actual ability, which means that there should be a clear plan before the curriculum begins to ensure that students can achieve the proposed goals.

PRG clearly points out that the program should be student-centered, and whether students can achieve the predetermined program objectives or the proposed learning outcomes should be taken as a necessary standard in the final review of the program. Program design is required to promote students' personal growth, and the abilities learned in the program can be applied to students' future career. These standards and requirements make the program design more pragmatic, so the basis of PR is clear. And it also makes the focus of PR return to the students, thus promoting the review system more rational.

3.2. The Combination of Quality Assurance and Quality Improvement

QA is not a simple quality supervision, but a virtuous circle of pursuing education quality, so that the HEI can achieve sustainable development. PRG require that PR must be conducted in accordance with the ADRI model from four aspects of program objectives, implementation, achievements and improvement. First of all, the scientific review model can test whether the setting of curriculum objectives is reasonable and highlight the principle of "student-oriented". Secondly, it can test whether the measures of the HEI on the curriculum are guided by the proposed goals in the process of teaching and learning. Thirdly, it can test the effectiveness of the implementation of the curriculum. Finally, it can put the improvement of curriculum on the important position of PR and supervise the HEI to improve the quality of education.

3.3. Strong Initiative in self-evaluation

Generally speaking, curriculum evaluation is always associated with "forced" and "unwilling". The lack of subjective consciousness makes the HEI think that curriculum evaluation is to superficially deal with the work of their superiors, but not to be combined with their own higher education quality improvement. It can be seen from the PRG that Macao seems to have a natural initiative in pursuing high quality. Because it is not only actively writing a review plan to apply to DSES for PR, but also contacting and selecting suitable EQAA. So, it can be seen that Macao is completely contrary to the passive atmosphere of "waiting for" in the Chinese mainland.

Some people usually think that PR is the HEI's responsibility, which has nothing to do with students. But students are experiencers of program, so they share the same feelings with the program. According to the PRG, the HEI can conduct regular surveys of teaching quality to students, and the survey results can serve as the key to improving the quality of program. As the feedback and suggestion of teaching quality, students have a strong subjective consciousness in PR, which is also consistent with the principle of "student-oriented".

4. Conclusion

Our country started the evaluation of higher education quality as early as 1980s, while the Chinese mainland has never issued a similar standardized curriculum evaluation guide. Under the influence of special cultural background and the efforts of DSES, Macao has formed a relatively complete quality evaluation system. And PR has become a major feature of QA. We study the PRG of higher education in Macao, which provides practical experience and reference for the improvement of program review system to Chinese mainland.

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Quality and Inequality: Students' Learning Experiences and Perceptions toward Online Learning amidst COVID-19

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Abstract

Under the raging pandemic, all stakeholders in higher education were forced to respond to unexpected educational changes. Universities shut down suddenly, students had no choice but to learn at home, and faculty members were forced to teach online without adequate preparation. As no one could predict the end of the pandemic, it is essential to ensure the quality of online learning before the pandemic ends or another proper solution comes out. The aim of this study is to examine students' learning experiences under the pandemic and explore online learning challenges as well as the inequality issues existed in online learning.

Keywords: quality assurance, online learning, COVID-19, learning experience

1. Introduction

Global higher education has experienced the unprecedented disruption and transformation since the outbreak of COVID-19 at the end of 2019 (Ghosh, 2020; Srivastava et al., 2020; World Health Organization [WHO], 2021). As of April last year, the number of students affected by school or university suspensions reached 1.57 billion, accounting for 91.5% of the global student population (United Nations Educational, Scientific and Cultural Organization [UNESCO], 2020). Online learning became the most popular alternative to traditional face-to-face teaching immediately under the sudden attack of the pandemic (Wang, 2020). However, the global tertiary education expert Jamil Salmi has pointed out certain issues and impacts related to rapid changes: (1) Closures and transition to online education- the degree of readiness was highly unequal across countries and institutions. Universities and colleges in developing countries have faced serious IT infrastructure and internet access difficulties, (2) Impact on students-the commotion brought about by the abrupt closure of campuses and the rapid switch to online education have disrupted the lives of students all over the world. Students from underrepresented groups have been hit especially hard, suffering economic hardship, connection difficulties, and emotional distress, (3) Assessment and exams in transition-many higher education institutions have struggled with difficult choices about online assessment and the risk of increased cheating (Salmi, 2021, p. 5).

Though online learning was not a new trend or phenomenon and 1990s and 2000s could even been seen as the optimal maturation time for online education (Ribeiro, 2020), the transition to online learning still caused a lot of controversy and discussion. Some scholars declared that online teaching mode adopted worldwide could be only regarded as a temporary solution, which should be called emergency remote teaching instead of online learning or online distance education (Bozkurt & Sharma, 2020). In spite of misgivings about online learning, it was more important to figure out the real experiences and perceptions of students. Thus, the study aims to realize the quality and inequality issues existing in students' online learning process. As COVID-19 has caused a rapid transition from traditional face-to-face teaching to online teaching, relevant issues need to be further explored. A rapid and comprehensive change to online learning required corresponding supporting measures and quality assurance mechanisms. In order to provide reference for developing appropriate assessment

criteria or adjusting current quality assurance mechanisms, the study explores students' experiences and perception toward online learning in Chinese Taipei. Based on the research aims, the research questions of this study are as follows:

1. How did students evaluate their online learning experiences under the impact of COVID-19?
2. What were the crucial factors influencing the effectiveness of online learning from students' perspective?
3. What were the major challenges encountered by students during the online learning process?
4. How parameters such as gender, degree level, family income, and university type affected online learning?

2. Literature Review

Information and communication technology (ICT) and higher education

Over the past decades, due to the advancement of ICT, global higher education has applied the technological skills to teaching innovation and learning experience improvement (Buttar, 2016). Particularly, after COVID-19, ICT-based solutions such as online or blended learning would instead become the new mainstream of education (International Centre for Higher Education Innovation under the auspices of UNESCO [UNESCO-ICHEI], 2021). Speaking of online learning, as it was denoted "learning experienced through internet in an asynchronous environment where students engage with instructors and fellow students at a time of their convenience and do not need to be co-present online or in a physical space" (Singh & Thurman, 2019, p. 302), the success of online learning highly relied on ICT. Generally, ICT was a blanket term of "any communication device or application, encompassing: radio, television, cellular phones, computer, and network hardware and software, satellite systems and so on, as well as the various services and applications associated with them, such as videoconferencing and distance learning" (Buttar, 2016, p. 1687). With the advancement of ICT, online education was considered capable of providing high-quality education. In addition, through the innovative teaching method, people believed online learning could provide interactive learning experiences, personalized learning, knowledge co-creation, and eliminate the constraints of time and space (Tertiary Education Quality and Standards Agency [TEQSA] & Asia-Pacific Economic Cooperation [APEC], 2017). Although people praised the benefits of online education, there were still many quality doubts about it. For instance, Mohamedbhai (2020) criticized the delivery of online learning and viewed it preposterous to make online learning effective by merely posting notes or recording videos on the web; yet, this was one of the common online learning models.

According to statistics, even by 2019, there were still 63% the rural population could not access the Internet at home (see Figure 1). The gap of Internet access between rural and urban areas was far larger in developing countries (International Telecommunication Union [ITU], 2020). For students, it was easily to be left behind with poor internet connections. Same for higher education institutions, it was challenged to deliver online education without adequate technological equipment (Adedoyin & Soykan, 2020). Though "learning organized or delivered through web-based or internet based technologies", "use of the internet to enhance interaction", "use of the internet to enhance the learning environment", "use of information and communication technologies", "technology-based learning", "audio/video CD-ROM, pre-2000 era" (Singh & Thurman, 2019, p. 295) were key concepts of online learning, well-trained faculty members, national qualifications frameworks, specific quality

standards or course development might be indispensable factors to reach flexible and quality education (UNESCO-ICHEI, 2021).

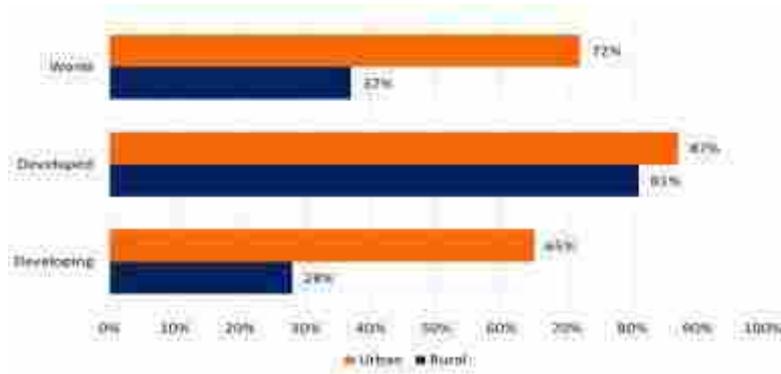


Figure 1 Percentage of households with Internet access at home, 2019
 Source: Adapted from ITU (2020)

Quality issues maintain a question mark for online learning

Higher education was forecasted to have a six-month to five-year disruption both domestically and internationally caused by COVID-19 (Dennis, 2020). After the outbreak of COVID-19, quality issues regarding online learning soon became the top concern of all stakeholders in higher education. At the national level, most countries did not regard the quality assurance of online education as an important matter. If it was not the pandemic, countries would not begin to reconstruct and emphasize the crucial role of technology in higher education (Wang, 2020). However, for a quick transition to online education, some national quality assurance agencies adopted a relatively loose attitude towards online courses assessment (Brown & Salmi, 2020). Online assessment was a pressing problem but the best choice to ensure students' learning outcomes (Coates, 2020). The quality assurance domains of online learning jointly proposed by higher education experts, counsellors and researchers in 2016 Quality Assurance of Online Learning Workshop (TEQSA and APEC, 2017) might be used as a reference of assuring online education quality or enacting relevant policies in the future (see Figure 2).



Figure 2 Quality assurance domains of online learning
 Source: Adapted from TEQSA and APEC (2017, p. 29)

In addition, TEQSA and APEC (2017) have listed certain dimensions of quality issues on online education (see Table 1), ranging from teaching, curriculum design, assessment, learning environment and qualifications etc. Under the rapid transformation of education learning mode, all related stakeholders supposed to be core elements for a quality online education. But for most faculty members, they were forced to go to the battlefield unarmed. All faculty members around the globe were given the mission of starting online teaching instantly without appropriate training and supports (Rapanta et al., 2020). These kinds of unprepared situation would lead to quality concerns and

complain of people. According a survey conducted in 2020, the results suggested that parents' attitudes toward the quality of online learning were not optimistic and parents were not willing to pay as much for online learning as face-to-face teaching. Majority of the parents deemed the quality of online learning was lesser quality than face-to-face teaching since instructors were considered unprepared and lack of IT capacity; and students' opportunities to interact with instructors and classmates in person as well the collaborative learning with classmates were sacrificed (Jaschik, 2020). As Temmerman (2019) stated, one of the major challenges related to online education is assuring parents, employers and students that the quality of online education received by students was as good as the face-to-face teaching mode.

Table 1
Relevant quality issues of online education

Dimension	Concern
Teaching and learning	Lack of teacher support and guidance.
	Lack of feedback.
	Teachers do not have the relevant skills to teach online
Course design and content	Units are content heavy
	Course structure is lacking.
Assessment tasks and authenticity	Academic integrity is questionable.
	Potential for plagiarism and/or fraud is high.
	Competency is not easily assessed.
Student experience and learning environment	Engagement between students is restricted
	Risk of student isolation is high
	Support is lacking.
	Drop-out rates are high
Qualifications and formal credentials	Units are not recognized

Source: Adapted from TEQSA and APEC (2017, p. 8)

3. Research Method

This study adopted the survey research approach as a major method to explore students' online learning experiences under COVID-19. The questionnaire design included the personal information, such as gender, degree level, family income and university type to examine whether the inequality issues existed. In total, 517 valid responses out of 531 returned questionnaires were analyzed.

Table 2
Distribution of respondents by Gender, Age, University type and Degree level (n=517)

Variables	Category	Number of respondents	Percentage of total respondents (%)
Gender	Male	177	34%
	Female	340	66%
Age	18-25	390	75%
	26-30	75	15%
	31-40	29	6%
	41 and above	23	4%
University type	Public university	314	61%
	Private university	203	39%

Degree level	Bachelor's degree	205	40%
	Master's & Doctoral degree	312	60%
Family income	Upper-income	86	16%
	Middle-income	372	72%
	Lower-income	59	11%

Source: Author

4. Research Findings

According to the survey results, certain parameters did show significant differences in online learning. For degree level, master's and doctoral students perceived overall online learning effectiveness was more affected in online learning, particularly in the dimension of “in-class interactions” and “after-class communications and consultancy with instructors”. In terms of family income, students from upper-income families agreed more on "University provides sufficient support for me to study online efficiently at home" than students from lower-income families. In addition, students from upper-income families agreed more on "Online learning has enhanced my self-study ability" than students from middle-income families. Following were students' responses and their learning experiences of online learning amid the COVID-19 pandemic.

- 1. Most students deemed in-class interactions (68.9%), stability of Internet connection (68.9%), and after-class communications and consultancy with instructors (51.8%) as the three major factors influencing online learning effectiveness.**

Most respondents indicated that in-class interactions, stability of Internet connection and after-class communications and consultancy with instructors were the three major factors influencing online learning effectiveness (see Figure 3). Especially the in-class interactions with instructors was emphasized by respondents as the significant concern. Corresponding to the urgent needs of students' online learning, about 43% of the respondents ranked the in-class discussions and thinking guided by instructors as the top urgent need during the online learning process (see Figure 4).

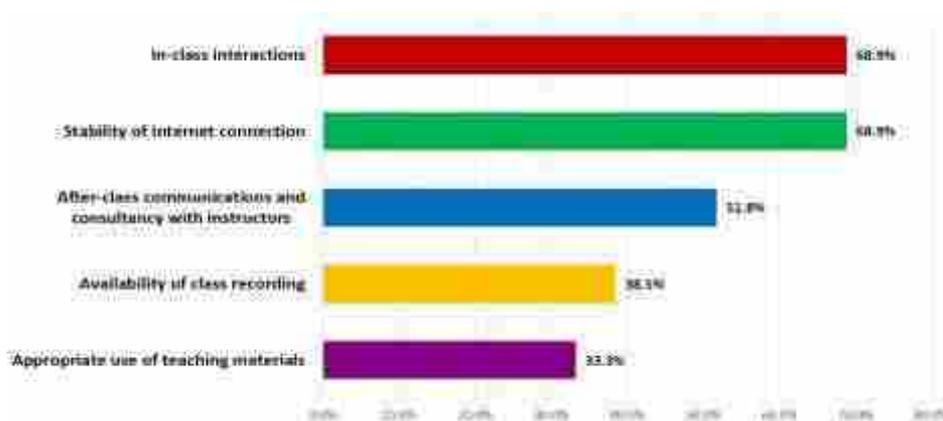


Figure 3 Factors influencing online learning effectiveness

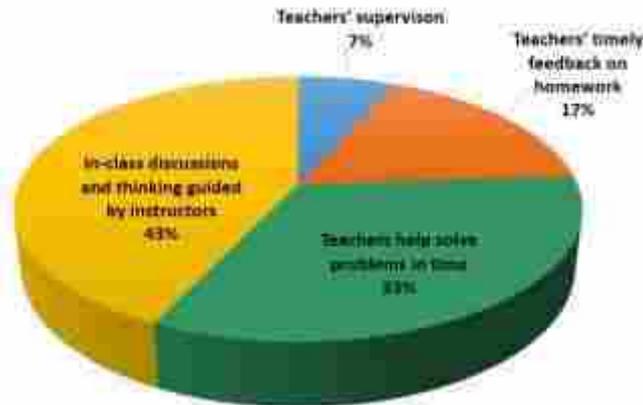


Figure 4 Students' urgent needs during the online learning process

2. Over 65 percent of the responding students perceived live broadcast plus recorded video as the most effective online learning mode.

The survey showed that different online teaching modes brought different learning effects for students. For students, the most effective online learning would be the use of live broadcast and recorded video simultaneously, which would be 13% higher than merely adopting live broadcast and 18% higher than merely adopting recorded video respectively (see Figure Compared to the actual situation, the survey found a gap between students' learning experiences and the HEIs' adoption of online teaching modes. In the light of students' responses, most HEIs adopted live broadcast as the common online teaching mode and only 33% of HEIs adopted live broadcast plus recorded video through online teaching (see Figure 6). The disparity of students' real learning experiences and HEIs' s actual teaching mode reveal the unfamiliarity of the public to online education and the pointed out the important issue of rapidly transferring to online education - quality of online learning. How to ensure the learning quality of online education and guarantee the effectiveness of online teaching have become critical topics for HEIs and the government to discuss.

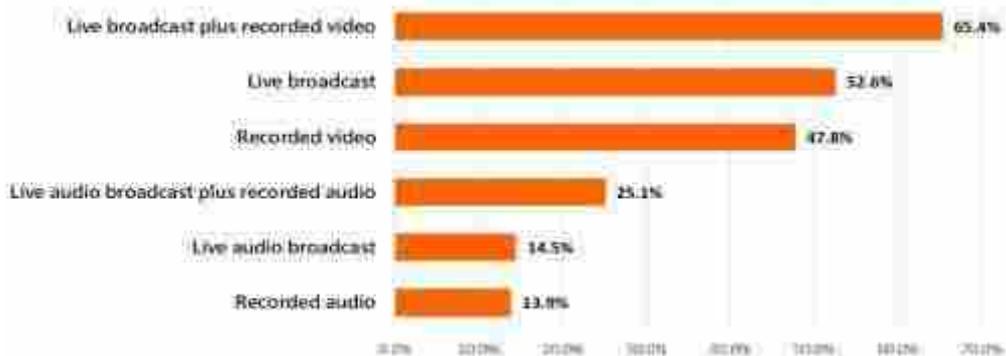


Figure 5 Rankings of students' perception toward effective online learning mode

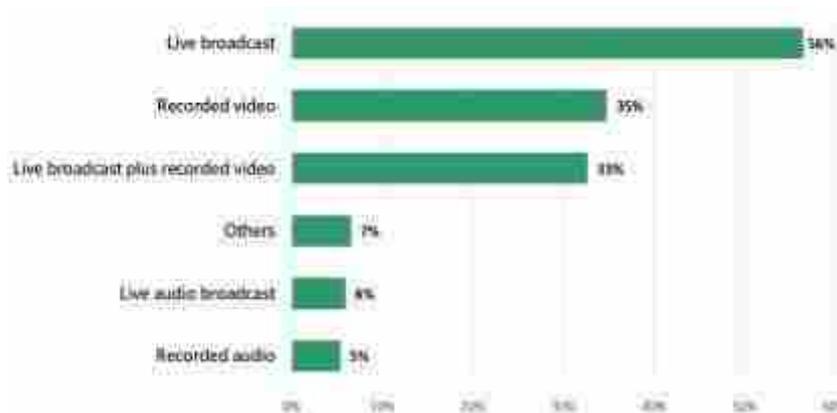


Figure 6 Actual situation of HEIs' adoption of online teaching mode

3. Major challenges faced by students in online learning including both external environment and internal personal factors.

Regarding the major challenges and difficulties faced during the online learning process, most students still perceived lack of interactions was the main challenge. 54.2% of the respondents indicated that a lack of interactions with teachers and classmates would be the serious learning problem. In addition to the external environment, 53.6% of the respondents deemed themselves were lacking in self-discipline and 50.1% of the respondents considered themselves were easily distracted by surroundings (see Figure 7).

In terms of online learning, Internet accessibility became the first priority for both government and HEIs to ensure students' learning right. However, nearly half of the respondents indicated that they have encountered the problem of unstable Internet connection during the online learning process. The actual learning situation reflected the deficiency of the transformation to online education of HEIs under COVID-19.

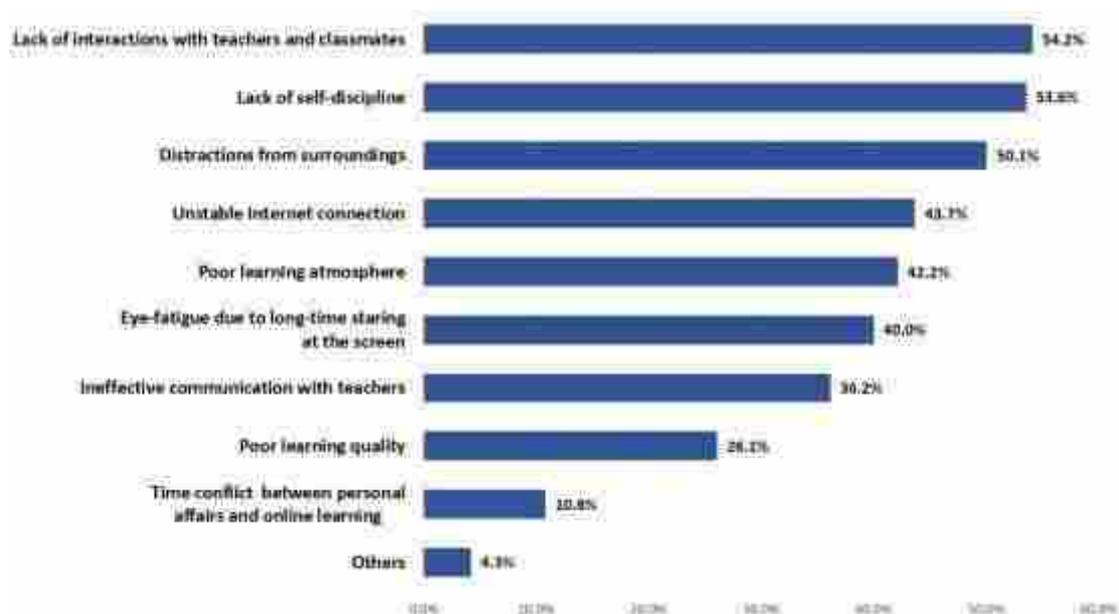


Figure 7 Major challenges of online learning

4. Nearly half of students thought online learning was not as effective as traditional face-to-face teaching. Only 6% of the students were very satisfied with online learning.

According to students' responses, online education' learning effectiveness was not as good as the traditional face-to-face teaching. Only 16% of the respondents thought online education' learning effectiveness was better than the traditional mode and merely 7% of the

respondents deemed online education' learning effectiveness was much better than the traditional face-to-face teaching (see Figure 8). In other words, online education at the moment could not replace traditional face-to-face teaching since there still tons of shortcomings need to improve.

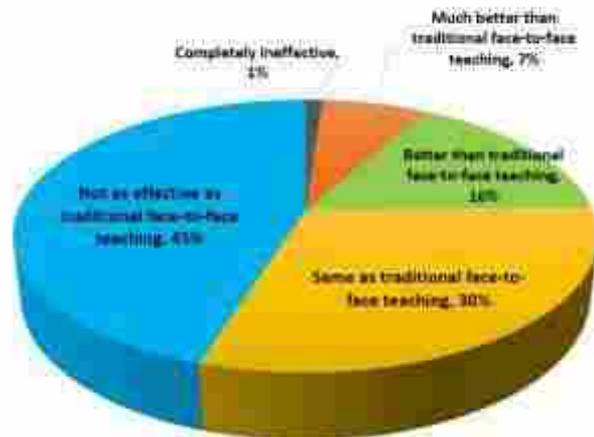


Figure 8 Students' perception toward online learning effectiveness

Generally speaking, only 6% of the students were very satisfied with online learning (see Figure 9). According to the survey, 51.3% of the respondents thought online learning has enhanced their self-study ability. Most of the respondents remain neutral attitude toward online learning. On the contrary, for students who were not satisfied with online learning may cause by the low interaction and engagement. 80.1% of the respondents perceived a low-level of interaction with teachers and classmates and 77.2% of the respondents considered classmates' enthusiasm for participation were lower throughout the online learning process.

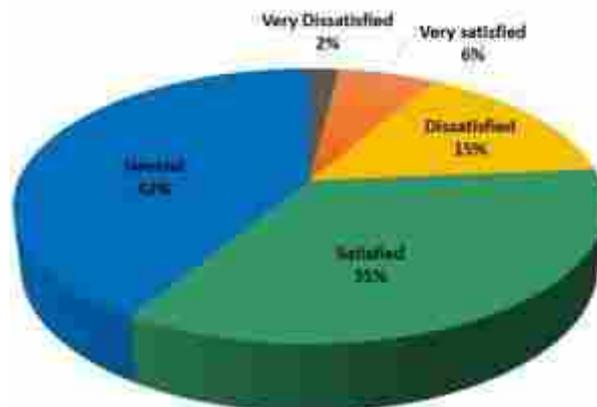


Figure 9 Students' overall evaluation toward online learning

5. Over 70 percent of students hope to resume face-to-face learning supplemented by online learning after the pandemic.

Overall, students prefer to maintain face-to-face teaching as the main teaching mode, with online education as a supplement (see Figure 10). The result suggested that HEIs should took both advantages of face-to-face teaching and online teaching into the current teaching mode to better enhance students' learning effectiveness. In addition, the survey result indicated a low preference toward fully adoption of online learning which reflected the inadequacy of online leaning in a way.

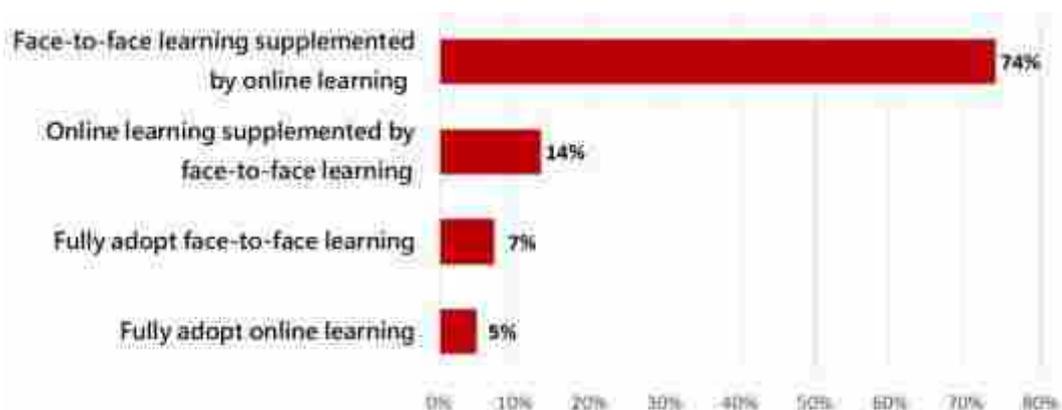


Figure 10 Students' preference toward the teaching mode after COVID-19

5. Conclusion

COVID-19 has transformed the landscape of higher education in diverse ways and students' learning has always been the priority concern. As most higher education institutions shifted to online education instantly, faculty member's ICT capacity, students' learning adaptation and the outcome measurement etc. have been the most challenging issues around the globe. Faculty members were supposed to receive professional training and online teaching skills to respond to the tremendous evolution. The gap between actual instruction and students' perceptions required not only emergent strategies at institutional level but also guidelines, principles or standards at national level. As online learning or blending learning would be the new normal in the post-COVID-19 era, the quality assurance of online education has become a common problem of whole world. Countries and quality assurance agencies ought to collaborate with international partners to come out with an appropriate assessment for online education to guarantee students' learning.

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Quality Assessment for Distance Higher Education Programs in Vietnam: Introduction, Benchmark and Lessons Learned

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Abstract

In the context of Industry 4.0 and the pandemic of COVID – 19, the quality of distance education in higher education institutions has been much concerned by stakeholders. This paper introduces distance education development and quality assessment standards for distance higher education programs in Vietnam. The paper also provides benchmark between Code of Practice for Program Accreditation: Open and Distance learning issued by Malaysian Qualifications Agency and Vietnam's quality assessment standards for distance higher education programs issued by the Ministry of Education and Training, from that the lessons are withdrawn for improvement. Some suggestions for the Ministry of Education and Training are also mentioned with hope to shorten the gap with international standards and to promote distance education quality improvement in Vietnam.

Keywords: accreditation, distance education, quality assessment

1. General introduction on distance education in Vietnam

1.1. Definition of distance education

In Vietnam, distance education is defined as “an education process in which the student and the teacher are mostly separated in time and place. By this mode of education, the students study through textbooks, video tapes, audio tapes, CD-ROMs, computer software, using personal audio-visual media, broadcasting radio, television, multimedia communication complexes and the internet under the management and support of the school” (MOET, 2003). This definition contains basic contents that UNESCO as well as other international institutions define about distance education. Distance education includes online education (with $\geq 80\%$ of the content delivered online) and blended education (with 30 – 79% of the content delivered online), as well as modes of education using printed material delivered by post and/or other tools for bridging the distance. Distance education programs have the same volume, content and structure as traditional programs of the same major and level. The degrees are guaranteed in legality and value as other forms of education by the government.

There are 4 methods of distance education : a) Mail: The program is conducted mainly by mail through the main printed learning materials (textbooks, reference books, study guides, researches, workbooks, exam and test guides); b) Radio and television: The program is mainly conducted through radio and television systems, in which the main learning materials are radio and television program that are broadcast live or replayed on radio and television channels; c) Computer network: The program is implemented mainly through computer networks, internet and telecommunications networks in which the main learning materials are electronic learning materials transferred over the network, the teaching is carried out online or offline; d) Combination: combine the above methods (MOET, 2017).

1.2. The history of distance education development in Vietnam

The history of distance education development in Vietnam can be divided into 2 periods of time: before and after 2009. Before 2009, there were not many research on distance education in Vietnam. Around 2003-2004, distance education in Vietnam attracted more attentions from many higher education institutions through many seminars and conferences on distance education held at school and national level. Vietnam has joined the Asia E-learning Network (AEN) with the participation of the Ministry of Education and Training, the Ministry of Science and Technology, the Ministry of Posts and Telecommunications and Ha Noi University of Science and Technology. Besides, some software companies in Vietnam launched a number of products to support training. Although these products were not perfect, they have initially contributed to promote the development of e-learning in Vietnam (Pham Hong Hanh & Ha Thanh Hoa, 2019).

After 2009, being invested by businesses and higher education institutions, distance education gradually has attracted the attention of many learners/students. In 2013, Hanoi Open University built an online training technology system, becoming the first university in Vietnam to provide a full e-learning program which has put the foundation in distance education in higher education institutions until today.

At present, Vietnam has over 100 bachelor degree programs under distance education managed by around 21 higher education institutions. The programs include a variety of majors such as: business administration, accounting, finance - banking, information technology, law, English, Vietnamese studies, tourism...

2. Introduction on quality assessment standards for distance higher education programs in Vietnam

2.1. The legal foundation of the establishment quality assessment standards for distance higher education programs in Vietnam.

In Vietnam, the policy of distance education development and information technology application has been early concerned, first shown on the Project "Development of distance education in the period 2005-2010" approved by the Prime Minister (2005). The Project mentioned the policy of developing and improving the quality of distance education; creating conditions for people, especially who live in remote areas with difficult socio-economic conditions for regular study and lifelong learning; that contributes to enhance the education level, professional and vocational skills; raises people's intellectual level and trains human resources for country industrialization and modernization. In 2015, the Prime Minister (2015) continued to promulgate the Project "Development of distance education for the period 2015-2020" which set a specific goal for all distance higher education programs to be accredited by 2020. Higher education institutions conducting distance programs are also encouraged to be accredited by reputable international accreditation agencies. To implement this Project, two legal documents have been issued including Circular No. 10/2017/TT-BGDĐT dated on April 28, 2017 of the Minister of Education and Training on Regulation on distance learning at university level (MOET, 2017) and Circular No. 39/2020/TT-BGDĐT dated on October 9, 2020 of the Minister of Education and Training stipulating standards/criteria for assessing the quality of distance education programs at university level (MOET, 2020). These two main documents created a solid legal foundation for the development of distance education, as well as emphasized the important attention to quality assurance of this form of education.

In particular, Law No. 34/2018/QH14 promulgated on November 19, 2018 by the National Assembly (2018) has a remarkable point in which there are no differences in degree value between different forms of education. All requirements of outcome standards, program content, teaching methods... of training programs, no matter what forms of training are implemented, must ensure the same quality. This adjustment reflects the spirit of integration with global education, creating equality for learners, and emphasizes the important role of quality assurance for all types of training.

From the above bases, standards/criteria for assessing the quality of distance education programs at university level were born, making the foundation for the quality assurance and accreditation of this type of education.

2.2. The structure of quality assessment standards for distance higher education programs in Vietnam.

Highly influenced by AUN-QA's assessment at program level (AUN-QA, 2015), the quality assessment standards for distance higher education programs in Vietnam (below called Vietnam's standards) has about 80% of the same content as the AUN-QA's assessment (*see Figure 1*). The remaining 20% is designed to be adapted with Vietnam education context and with the features of distance education programs (especially facilities, infrastructure and materials, as well as Program Management).

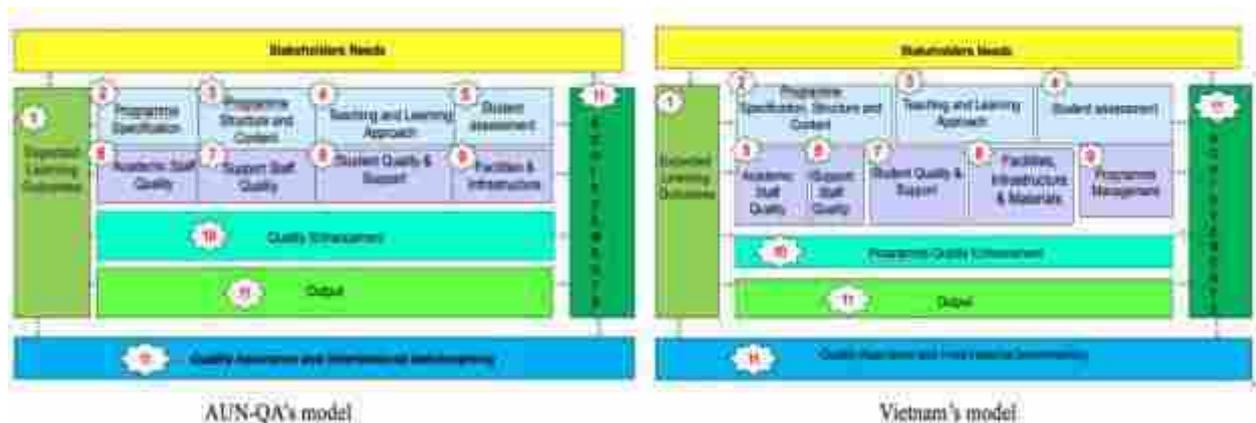


Figure 1. Comparison between AUN-QA and Vietnam's model

The Vietnam's model (*see Figure 1: the model on the right*) includes the following eleven standards: (1) Expected Learning Outcomes; (2) Program Specification, Structure and Content; (3) Teaching and Learning Approach; (4) Student Assessment; (5) Academic Staff; (6) Support Staff Quality; (7) Student Quality and Support; (8) Facilities, Infrastructure and Materials; (9) Program Management; (10) Program Quality Enhancement; (11) Output.

The model starts with stakeholders needs which are transferred into the expected learning outcomes which drive the program. In the center, there are four rows in which the first row addresses the question of how the expected learning outcomes are translated into the program; and how they can be achieved through teaching and learning approach and student assessment.

The second row considers the "input" into the process including academic and support staff; student quality and support; facilities and infrastructure and materials; and Programs Management.

The third row addresses the program quality enhancement which requires to identify the methods to get feedback from stakeholders, to measure and to use feedback for improvement. The concept of PDCA (Plan, Do, Check, Act) is manipulated into the process of improvement.

The fourth row focuses on the output of the program including pass rates and dropout rates, the average time to graduate, employability of the graduates, research activities and stakeholders' satisfaction.

The final column addresses the achievements of the expected learning outcomes and the program. The model finishes with the fulfilment of stakeholders' needs and the continuous improvement of the quality assurance system and benchmarking to seek best practices.

3. Benchmark with Code of Practice for Program Accreditation: Open and Distance learning (COPPA: ODL - MQA)

According to my research, in countries of ASEAN, Malaysia, specifically Malaysian Qualifications Agency (MQA) has developed and applied Code of Practice for Program Accreditation: Open and Distance Learning (COPPA: ODL) for accreditation and program audit purposes. The COPPA:ODL contains specific indicators and benchmark standards that will guide the institutions in the development, delivery, assessment as well as the monitoring and review of the ODL program (Malaysian Qualifications Agency, 2019).

Compared with COPPA: ODL, the Vietnam's standards are mostly the same in term of assessment domains (*see Table 1*). Although the distribution/arrangement of criteria and sub-criteria is different, both focus on assessing these following main areas: Program Development and Delivery, Student Assessment, Academic Staff, Student Support, Facilities and Materials, Program Management, Continual Quality Enhancement.

Vietnam's standards	COPPA: ODL (MQA)
1. Expected Learning Outcomes	1. Program Development and Delivery
2. Program Specification, Structure and Content	1. Program Development and Delivery
3. Teaching and Learning Approach	1. Program Development and Delivery
4. Student Assessment	2. Assessment of Student Learning
5. Academic Staff	4. Academic Staff;
6. Support Staff Quality	4. Academic Staff;
7. Student Quality and Support	3. Student Selection and Support Services;
8. Facilities, Infrastructure and Materials	5. Educational Resources;
9. Program Management	6. Program Management
10. Program Quality Enhancement	7. Program Monitoring, Review and Continual Quality Improvement.
11. Output	7. Program Monitoring, Review and Continual Quality Improvement.
11 criteria, 55 sub-criteria	7 criteria/areas, 21 sub-criteria

Table 1. Comparison between Vietnam's standards and COPPA: ODL (MQA)

Through benchmark with COOPA: ODL, there are some important and special points that Vietnam could learn as follows:

Firstly, COOPA: ODL emphasizes the sufficiency in academic autonomy of the ODL Program department and staff in Program development and management. These points are clearly mentioned at sub-criteria: 1.2.1, 2.3.1, 4.2.2, 6.1.4 (*see Table 2*). However, these requirements have not been mentioned in Vietnam's standards while academic autonomy is one of the basic and important requirements in higher education.

A HEP is expected to have sufficient autonomy, especially over academic matters. Such autonomy must be reflected at the departmental level where the Program is being designed and offered.

1.2.1 The department must have **sufficient autonomy** to design the curriculum and to utilise the allocated resources necessary for its implementation.

2.3.1 The department and its academic staff must have an **adequate level of autonomy** in the management of student assessments.

4.2.2 The academic staff must be given **sufficient autonomy** to focus on areas of their expertise.

6.1.4 The academic board of the department must be an effective decision-making body with an **adequate degree of autonomy**”.

Table 2: Sub-criteria: 1.2.1, 2.3.1, 4.2.2, 6.1.4 (Malaysian Qualifications Agency, 2019)

Secondly, COOPA: ODL requires clearly the **alignment** between the Program with Malaysian Qualifications Framework (MQF) in some aspects, such as: learning outcomes; assessment principles, methods and practices (*see Table 3*). However, in Vietnam's standards, there is only one standard (sub-criteria 1.2) that refers the alignment between Program learning outcomes and Vietnamese Qualifications Framework (VQF), but the related requirements do not show in detail how and what clusters of VQF learning outcomes should be assessed. This could make the institution and external assessors pay less attention on this alignment and then not assess exactly and specifically the alignment level.

1.1.4 The Program learning outcomes must correspond to an MQF level descriptors and the five clusters of MQF learning outcomes: i. Knowledge and understanding; ii. Cognitive skills; iii. Functional work skills; iv. Personal and entrepreneurial skills v. Ethics and professionalism.

2.1.1 Assessment principles, methods and practices must be aligned to the learning outcomes, consistent with the levels defined in the MQF.

Table 3: Sub-criteria: 1.1.4, 2.1.1 (Malaysian Qualifications Agency, 2019)

Thirdly, COOPA: ODL guideline shows clearly the relationship between criteria/areas and sub-criteria (for example sub-criteria 1.1.2 must be read together with sub-criteria 1.2.2 in Area 1 and

6.1.6 in Area 6...). This helps the institutions and external assessors have an overview picture of the matrix of criteria/areas and sub-criteria relationship, from which the quality of assessment/self-assessment become more comprehensive. I can not find this information in the Vietnam's standards.

Finally, through the information I got from the conference "Education & Research in the COVID-19 Era" organized by DESE Australian High Commission KL from 23 -25 August 2021, 336 ODL programs (the statistics updated to 30 April 2021), including provisional accreditation and full accreditation, were assessed and accredited using COOPA: ODL (MQA, 2021). While, in Vietnam, although standards have taken effect from November 2020, however, there has not been any programs assessed and accredited. The lack of clear processes and guildances for implementing the standards should be the main reason for this situation.

As it can be found that there are many similar points in context between Malaysia and Vietnam, Vietnam should do more research on distance education quality assessment in Malaysia, including how to build and apply the COPPA: ODL, from that good practices could be learnt for improvement.

4. Conclusion and suggestion for Vietnam

This paper introduced the situation of distance higher education, as well as the quality assessment standards for distance higher education programs in Vietnam. The paper also showed some important points withdrawn through benchmark/comparison between COPPA: ODA (MQA) and Vietnam's standards. Some more suggestions for the Ministry of Education and Training in Vietnam are shown as follows:

- Conduct more regional and international research on distance higher education assessment, from that they have scientific and practical basis for building up the quality assurance system for distance higher education programs.
- Build sufficiently guildlines on process, methods and instrument for distance higher education assessment.
- Encourage institutions who are offering distance programs to build up and carry out quality assurance process to distance programs. When the internal quality assurance process is implemented well enough, they can be ready for external assessment and be accredited.

I believe that the above suggestions if being concerned by the Ministry of Education and Training will help Vietnam's standards shorten the gap with international standards and improve the quality of distance programs in higher education institutions.

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My name is Ho Dac Hai Mien. I am currently in charge of Vice-Director of Center of Education Accreditation, which was established by the Ministry of Education and Training and has been managed by Vietnam National University – Ho Chi Minh City. The current working place gives me precious opportunities to build strong connections with many universities inside and outside of Vietnam. Pursuing a career in higher education, especially in quality assurance and accreditation is my passion, from that I have chances to experience, to learn, to share and to contribute.

Research on the Development Trend of Higher Education in the Era of Artificial Intelligence

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Abstract

with the arrival of the era of artificial intelligence, the traditional mode of training talents in higher education is challenged, and the development of The Times puts forward new requirements for higher education. How to use artificial intelligence to promote the process reengineering of higher education and improve the precision level of education service has become an urgent issue of The Times. The use of artificial intelligence technology to bring personalized learning experience to learners, to provide intelligent support for learners' lifelong learning, and to build a learning-results-oriented education quality evaluation system are the main characteristics of artificial intelligence to help the development of higher education. Therefore, it will promote the profound reform of higher education and guide the development direction of higher education.

As an important driving force for the new round of scientific and technological revolution and industrial transformation, the vigorous development of artificial intelligence has not only profoundly changed human life, but also had a significant and far-reaching impact on economic development, social progress, people's livelihood improvement and other aspects. From the perspective of practice, the influence of artificial intelligence on personalized talent cultivation, lifelong education and all-round learning is emerging. Artificial intelligence education and discipline construction of artificial intelligence are developing rapidly, and artificial intelligence is "enabling" higher education, becoming "reality" from "expectation".

1. Characteristics of artificial intelligence assisting the development of higher education

With the application and popularization of artificial intelligence in the field of higher education, accurate, customized and personalized education and learning will be realized. The boundary of the classroom will be broken, and the relationship between "teaching" and "learning" will be redefined. It can be predicted that "learner-centered" will become the main feature of artificial intelligence to help the development of higher education:

First, artificial intelligence brings personalized learning experience to learners. "Learner-centered" has always been one of the goals of China's higher education reform and development. The application of artificial intelligence technology in higher education can help schools and teachers achieve personalized education and provide personalized learning experience for students. Can accurately to each student's learning time and learning preferences, attention direction, job completion quality of simple test data collection, more accurate to draw students "knowledge map", and more importantly, artificial intelligence can be based on learners' learning behavior data collection and analysis, provide personalized learning result feedback, form the personalized stage learning solutions, and through the intelligent data collection for the next step follow feedback learning, improve learning solutions, so as to provide high-quality personalized for each of the learners' education.

Second, artificial intelligence provides intelligent support for learners' lifelong learning. With the development of artificial intelligence, higher education will extend learners' lifetime and achieve

wider coverage. Lifelong learning is the objective requirement of learners' personal development and social progress, as well as the inevitable choice in the era of artificial intelligence. With the assistance of artificial intelligence, learners can have a deeper understanding of themselves and realize self-learning based on their own needs in study, work, life and interests. In this process, artificial intelligence is not only the driver and supporter, but also the helper and companion.

The third is to construct a learner learning results-oriented educational quality evaluation system. The "learner-centered" education model in the era of artificial intelligence needs the corresponding education quality evaluation system as a guarantee. Therefore, to break the disciplinary boundaries, shaping the multidimensional study of personalized, diversified space, on the basis of building the learners learning results oriented education quality evaluation system, the integrated use of teaching, learning, practice, scientific research, management, and other large multidimensional data, form the result of the learners' learning, learning process and teachers' teaching feedback and Suggestions, to the quality evaluation to promote the continuous improvement of the teaching process.

2. Artificial intelligence drives profound changes in higher education

The arrival of the era of artificial intelligence will further promote the profound reform of higher education:

First, we need to make the training model personalized and characteristic. Under the environment of artificial intelligence, the mode of talent training will change significantly. The large-scale, high speed, whole-process transmission and feedback of learning data become possible, which will break the situation that learning resources are available to all in the traditional network and technological environment. The education environment will become more intelligent, and ubiquitous communication network and sensing equipment will break down the data barriers inside and outside the class, promoting the seamless integration of online and offline courses. Educational resources will actively adapt to the specific needs of individuals. Comprehensive and real-time information perception and data transmission will bring accurate analysis of learning scenes and characteristics, actively create learning environments for students, plan learning paths and push adaptive learning resources, and realize the transformation from "information seeking" to "information seeking".

Second, promote interactive and intelligent teaching methods. Based on the characteristics of artificial intelligence technology, a series of new technologies and methods will be widely popularized in the field of teaching, which will greatly stimulate students' imagination and creativity and promote students' comprehensive understanding and mastery of knowledge. There are more possibilities for the application of AR/VR holographic technology, and the stable output of had live broadcasting will fully present teaching activities, enabling immersive classroom experience. The scene of artificial intelligence application is gradually deepened, and the intelligent environment it creates will enhance students' learning cognition in an all-round way. The experience and interaction of distance education and MOOCS will be greatly improved, and the perception and feedback of teaching participants and teaching process will be more profound.

Third, promote equity and integration of educational resources. Artificial intelligence's powerful technical advantages, will break through the limitation of time, space, content, media, in order to solve the technical difficulty in the field of higher education to provide effective solution: it will

promote the comprehensive sharing of education services, through high quality education information high speed data gathering and transmission across space, help education resources sharing and real-time connectivity; It will enhance the collaborative function of education services and contribute to the integrated interaction and cooperation of educational information by connecting various devices, terminals and systems. It will optimize the regulating function of education services, realize equal supply of educational opportunities and resources, and help solve the problem of unbalanced development of education in China.

Fourth, we need to make education ecological and intelligent. In the intelligent technology and ubiquitous high-speed communication environment, artificial intelligence will promote the integration and interconnection of education ecology and intelligence coverage, greatly improve the overall cooperation ability of education, information and data transmission and processing without obstacles, highly reliable, thus driving all kinds of education to provide convenient, fast, efficient and intelligent services; It will promote the intelligent coordination of various types of education, and help realize the specific needs and intelligent control of education management, teaching and training, education services and other businesses through the use of artificial intelligence technology. It will reconstruct the business process and build the interconnection among people, people and things, and things and things in the artificial intelligence environment, which will help promote the efficient integration and intelligent transformation of the business process of the education system.

3. Artificial intelligence helps guide the development direction of higher education

Due to the rapid development of artificial intelligence, far beyond people's imagination, higher education must actively cope with the urgent need:

First, innovation in education. With the help of the Internet and artificial intelligence algorithm, a new teaching method of "interactive discussion in class, answering students' questions and extracurricular video learning" is designed and created. This integrated teaching mode of "self-help, mutual assistance, others' help + all for free" guides the MOOC revolution and pushes the supply-side reform of higher education to the forefront of reform. We can make further progress in the fragmentation of the education supply side, content is king, customization, and the transformation of Internet connectivity. At the same time, higher education should integrate integrity into the artificial intelligence ecosystem, so that all people have the opportunity to make full use of digital, and improve the survival ability and learning ability of students in the digital era.

Second, the development of artificial intelligence. We should strengthen the integration of personnel training and innovation research bases, improve the multi-agent collaborative education mechanism in the field of artificial intelligence, and train multi-level talents in the field of artificial intelligence in various forms. We will support colleges and universities in setting up ai disciplines in computer science and technology, improve the discipline system of ai, promote the construction of first-level disciplines in ai, and form a new model of "ai +X" composite talent training. Driver of higher education is a new technology, is leading the development of the society, therefore, the development of artificial intelligence discipline according to the requirements of the economic and social development and the trend of new technology, make its independent design, independent control and solving domain, way to cultivate innovative talents, in order to solve the problem of the sustainable development of artificial intelligence.

Third, develop the ability to think deeply and independently. When artificial intelligence can help us make social decisions, there may come a time when "everything is handled by artificial intelligence". Therefore, our thinking ability will become weaker and weaker. At present, such as writing ability, writing ability, broad vision reading and macro thinking have been weakened, as well as the thinking ability of police officers and judicial personnel brought by smart policing and smart judicature has been weakened. In fact, we should deeply cultivate the ability of independent thinking and take artificial intelligence as a "reference", that is, people should refer to the "different possibilities" of artificial intelligence while adopting human judgment. Artificial intelligence is constantly learning, with the purpose of making continuous progress through artificial intelligence, among which the technology of proper processing and visualization of huge big data will be very important. At a time when artificial intelligence has undoubtedly penetrated into all aspects of the society, whether artificial intelligence can be fully used as a reference and an in-depth and independent thinking will undoubtedly become an important judgment basis for cultivating innovative talents in higher education in the future.

Fourth, cultivate the ability of man-machine peaceful coexistence. Although artificial intelligence still lacks abstract ability, fear heart and concept of time, how will human-machine coexist in the future, artificial intelligence be used for the war between people, artificial intelligence even evolve into a species, what will society become? In addition to the need for humans to think for themselves, we must think about how to live peacefully with ai, even if at different levels. At the macro level, higher education is transforming from "knowledge system" to "capacity system". The only way to realize the peaceful coexistence of human and machine in the future world is to make human beings stronger, even to develop the ability to defend robots, and to reconstruct the curriculum system with "creativity" as the core, which is the vision and mission of higher education.

Fifth, strengthen the rule of law and moral construction of artificial intelligence. Privacy leakage, data infringement, security risk and other issues of artificial intelligence have attracted attention in the field of higher education, but compared with the rapid development of artificial intelligence technology, the formulation of relevant laws and regulations is still relatively lagging behind. It is imperative to carry out studies on civil and criminal liability confirmation, privacy and property rights protection, information security utilization and other legal issues related to the application of artificial intelligence, establish a traceability and accountability system, and clarify the legal subject of artificial intelligence and relevant rights, obligations and responsibilities. In the process of ai rule by law, the basic features and iteration speed of ai should be taken into overall consideration, and legislation should be the first step to explore the formation of special laws and regulations so as to provide legal guarantee for "good governance" of ai. In addition, some researchers regard artificial intelligence as "human extension" from the perspective of ethics, and propose that artificial intelligence must abide by the moral standards, ethical norms and basic values of human society, that is, artificial intelligence systems designed and developed by human beings should become "moral machines". In order to ensure the healthy development of artificial intelligence in higher education, universities should actively carry out the research on the ethical issues of artificial intelligence, establish the ethical framework of ethical and moral evaluation institutions and human-computer cooperation, highlight the basic principles of benefit and justice, and embed the ethical framework in the design of artificial intelligence system.

The future has come, artificial intelligence is not just a technology, a professional, an industry, but a new way of thinking, education, life, production and development direction. Colleges and universities should grasp the development trend, put the connotational development in the space and time pattern of the era of artificial intelligence to plan and promote, embrace artificial intelligence, and make new contributions to the development of higher education in the new era.

Author's bio:



Jian-hua Wang, Shanghai education assessment, director of the comprehensive, long-term engaged in education teaching management, the evaluation and research work, and developed dozens of education evaluation study or practice project, as a group leader for the Chinese ministry of education and Shanghai municipal education planning topic, for education quality assurance has a more in-depth exploration and research.

Research on External Quality Assurance of Distance Education in Sri Lanka

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Abstract

In order to further improve the quality of distance education, the University Grants Commission of Sri Lanka (UGC) has formulated a corresponding quality assurance system for the Open University of Sri Lanka (OUSL). The quality assurance system combines internal and external quality assurance, and develops evaluation indicators and procedures full of distance education characteristics. This research first introduces and explains the distance education quality assurance system that combines internal and external. Then, from the perspective of the external quality assurance system, it sorts out its quality assurance measures for distance education based on the evaluation indicators, and analyzes the characteristics of the evaluation indicators. Finally, this research presents the reflections and improvements made by the Sri Lanka Development University based on the quality assurance system for reference. the quality assurance of distance education combing Internal and External in Sri Lanka can provide a reference for China's distance education quality assurance.

Keywords: Open Distance learning; open university, distance education

1. Introduction

At present, most areas will still apply the quality assurance system developed for traditional universities to open universities, and use the traditional education assurance system to carry out quality assurance work for distance education. This situation will lead to “unsuitable” or “incompatible” quality assurance for distance education. "Dislocation" problem. The Open University of Sri Lanka (OUSL for short) is characterized by open and distance education, and based on the Sri Lanka Qualification Framework (SLQF), it has established a relatively complete quality assurance system that combines internal and external quality. Under this system, the quality of distance education in the Open University of Sri Lanka has achieved certain results. From June to November 2020, the Asia-Pacific Education Quality Assurance Organization (APQN) conducted an education quality assessment of the Open University of Sri Lanka. Based on the evaluation data, this study combed and analyzed the external quality assurance measures of distance education that we can learn from, in order to provide a reference for the quality assurance of online education in China.

1.1. Introduction to the accreditation of the Open University of Sri Lanka

1.1.1. Open and distance learning model (ODL)

With the advent of the post-pandemic era, higher education will further accept open and distance learning as one of its teaching modes.

- (1) **Blended learning mode: open learning and distance education.** Open and distance learning (ODL) is a mixed learning model of open learning (OL) and distance education (DE). Open learning belongs to the category of educational philosophy. Distance education is a form of education in which teachers, students, and educational organizations communicate and interact through multimedia technology. Most of the teaching and courses can be

delivered to multiple learners. Therefore, the open and distance education model has both the above two characteristics and presents a new system ecology. Open and distance learning can specifically provide teaching mode services to open universities, and can also be used as a means for online education in traditional universities.

- (2) **For education fairness: expand educational objects.** In order to further promote education equity, expand people's access to higher education, and promote lifelong learning, the Open University of Sri Lanka has established and improved infrastructure for open and distance learning operations across the country. For example, it has established a network of regional and learning centers for remote areas. Or learners with poor foundations provide opportunities for higher education. The Open University of Sri Lanka also incorporates this goal and corresponding measures in its standards.

1.1.2. The Quality Assurance of Distance Education Combining Internal and External in Sri Lanka (PDCA mode)

- (1) **Quality concept based on stakeholders.** In the "Evaluation Manual for Open and Distance Learning Institutions", UGC believes that the quality assurance system for open and distance learning models should be more based on diverse stakeholders (Figure 1).



Figure 1 - Concept of Quality in relation to Stakeholders¹⁹

It can be seen from the figure that quality assurance should start from different stakeholders and meet the needs of as many stakeholders as possible. The needs of diversified stakeholders are transformed into the vision, mission, and goals of colleges and universities, which are expressed and practiced through three aspects: teaching and learning, research and innovation, and social service. In order to ensure the reasonableness of the relevant policy requirements of the colleges and service.

- (1) **Quality assurance cycle system combining internal and external.** The overall quality improvement of colleges and universities is based on the two pillars of internal quality assurance and external quality assurance. UGC believes that internal quality assurance (IQA) is the main content of the quality assurance system, and has established a school internal structured cycle system called "Plan-Do-Check-Act" (PDCA). At the same time, UGC also established an external quality assurance system (EQA) in which external peer teams conduct periodic external quality assurance processes, and functionally linked internal and external quality assurance to form a comprehensive quality assurance cycle system (Figure 2).

¹⁹ Source: UGC. Manual for Institutional Review of Sri Lankan Distance Higher Education Institutions[Z]. Asia Pacific Quality Network (APQN) conducts quality evaluation data for Sri Lankan Development University.

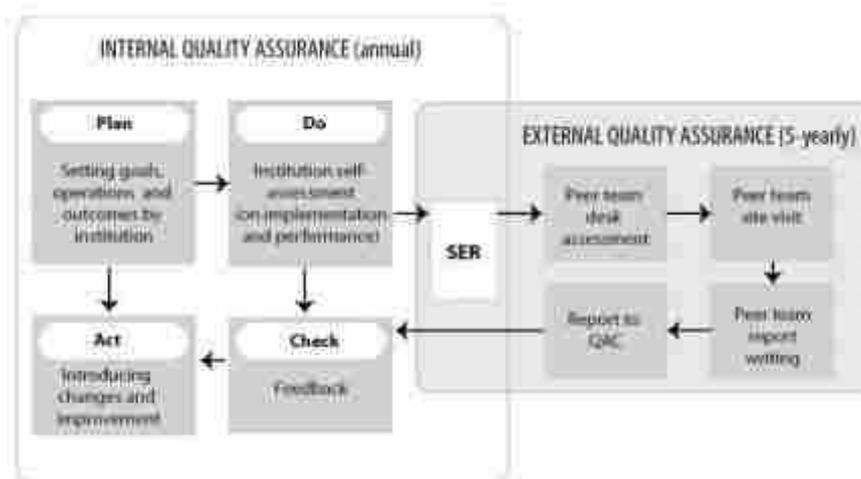


Figure 2 - Quality assurance as a continuous cycle²⁰

The "PDCA Internal Quality Assurance Cycle" established by UGC consists of four parts: "Plan → Implementation (Do) → Feedback (Check) → Improvement (Act)". In the "plan" part, on the basis of determining the needs of stakeholders and conforming to the Sri Lanka Quality Assurance Framework (SLQF); in the "implementation" part, should follow the plan and implement the plan according to the actual situation; in the "feedback" part, the current quality and performance should be evaluated through the monitoring feedback of all stakeholders, and the parts that can be improved and the strategic plan for future development should be determined; In the "improvement" part, the previous deficiencies should be improved, and operational improvement procedures should be established to ensure that the quality of education, teaching and services is continuously improved through internal quality monitoring.

2. Quality evaluation standards for distance education

2.1. Analysis of Evaluation standards of the Open University of Sri Lanka

UGC has established 10 primary standards, 237 secondary standards, and detailed regulations on the measurement content, scores, and Weighted minimum score (Table 1).

Table 1 - Evaluation standards for the quality of education in the Open University of Sri Lanka²¹

N	primary standards	secondary standards	Weighted minimum score
1	Vision, mission and planning	24	80
2	Governance and management	40	150
3	The learners	13	50
4	Human resource development	22	100
5	Programme design and development	30	100
6	course design and development	24	120
7	Learning infrastructure, resources & learner support	28	150
8	Learner assessment and evaluation	21	100

²⁰ Source: UGC. Manual for Institutional Review of Sri Lankan Distance Higher Education Institutions[Z]. Asia Pacific Quality Network (APQN) conducts quality evaluation data for Sri Lankan Development University.

²¹ Source: UGC. Institutional Reviews 2019 conducted by the Quality Assurance Council University Grants Commission, Sri Lanka [Z]. Asia Pacific Quality Network (APQN) conducts quality evaluation data for Sri Lankan Development University .

9	Postgraduate studies, research, innovation and commercialization	27	100
10	Community engagement, consultancy and outreach	8	50
Total score			1000

2.1.1. Vision, mission and planning.

First of all, for institutions such as the Open University of Sri Lanka that are based on open and distance learning, their main purpose should be to contribute to the democratization of higher education; secondly, the school should establish a sound internal for open and distance education Quality assurance system, credit transfer system, information collection and management system (MIS), and support service system; finally, information and communication technology (ICT) learning and application channels should be provided to school faculty and staff.

2.1.2. Governance and management.

(1) The resources and financial needs of colleges and universities should be planned and allocated based on the characteristics of open and distance education; (2) Courses with open and distance teaching methods should have their own independent curriculum development model, teacher-student ratio and teaching strategy; (3) Teachers and students should have systematic training courses for open and distance learning models; (4) Collect and save all learning records of learners from enrollment to graduation through the information collection and management system (MIS) to carry out procedural, Formative follow-up evaluation.

2.1.3. Learners and their assessment.

(1) Diversified learners; (3) Quality Auxiliary research methods. A qualitative research and evaluation method should be used to evaluate the educational quality of colleges and universities to provide information for decision-making. (4) Timely feedback. The evaluation of learners should use remote technology and the use of ICT capabilities to provide timely feedback, and maintain effective communication at any time to promote teaching and learning by evaluation.

2.1.4. Human resource development.

(1) Professional staff and organization; (2) Mutual supportive and well-functioning departmental systems. Different from traditional teaching, the open and distance learning model involves a complex division of labor, especially the coordination of teaching, administration, support services and other departments. Pay close attention to the flow and changes of online records and materials, so that the work of a separate department becomes Professional team work²². (3) Feedback based on evidence. In open and remote classrooms, feedback from college learners, teachers, and staff plays an important role in improving the quality of education. Therefore, the advantages of online technology should be used to expand feedback channels.

2.1.5. Professional and curriculum design and development.

(1) Curriculum design based on open and distance learning mode ; (2) Development of online technology to provide complete learning related to majors and courses Material.; (3) Learner-centered principles. The open and distance learning model is learner-centered, and it is necessary to increase learners' classroom participation through the improvement of teaching strategies, the use of

²² Source: UGC. Institutional Reviews 2019 conducted by the Quality Assurance Council University Grants Commission, Sri Lanka [Z]. Asia Pacific Quality Network (APQN) conducts quality evaluation data for Sri Lankan Development University.

mixed models, the improvement of teachers' ICT capabilities, and the integration of multimedia technologies.

2.1.6. Infrastructure support and resource sharing.

Under the open and distance learning model, the separation of teachers and students has become its basic feature, and support services serve as a bridge among them to bridge the time and space gap between the two subjects in the classroom²³. (1) Provide comprehensive support services. (2) Update and improvement. (3) Inclusive education environment. (4) System training.

2.1.7. Research, innovation and social services.

(1) Strengthen the research on open and distance learning.; (2) The teaching staff must participate enough Academic events. (3) Continuous monitoring of social services through ICT. Using remote technology and the use of ICT capabilities, we will continue to systematically collect social service status, analyze and communicate with each other.

2.2. Characteristics of the evaluation standards of the Open University of Sri Lanka

The scale and influence of open and distance learning models have gradually expanded in recent years, but with the development, challenges have also escalated. One of the important challenges is that many external quality assurance agencies or institutions themselves often use quality evaluation indicators developed for traditional universities to evaluate distance education institutions or institutions that focus on open and distance learning. From the evaluation indicators set up by UGC for the Open University of Sri Lanka, we can summarize the differences from traditional evaluation indicators.

2.2.1. Pay attention to the democratization of education and lifelong learning. In the vision of this type of institutions, it is clearly stipulated that institutions based on open and distance learning models should use their flexibility in learning time and space to provide as many people as possible the opportunity to receive higher education, of which two special attentions should be paid. Groups: (1) Provide opportunities for groups in remote areas or poor areas to receive high-quality education²⁴; (2) Provide lifelong learning opportunities for adults who want to acquire knowledge and skills who have left school education. Therefore, the interoperability of various types of learning is specifically stipulated in the indicators on this basis, so that each learner can easily and quickly transfer credits and study plans.

2.2.2. Establish the quality assurance concept of "learner center". A major feature of the open and distance learning model is that it can use powerful online technology and database support to safely and conveniently store a large amount of information for use at any time. Compared with traditional education, this model can better implement the concept of "learner center": (1) Establish a "learner profile". By categorizing and storing the gender, educational background, learning records, and practice records of all students, each learner can build a personal growth portfolio²⁵.Based on this portfolio, personalized analysis of future career planning, learning trends and development points can

²³ Ling Ling. Foreign Open Distance Education A comparative study of learning support service standards[J]. Adult Education, 2020,40(06):11-16.

²⁴ UGC. Manual for Institutional Review of Sri Lankan Distance Higher Education Institutions[Z]. Asia Pacific Quality Network (APQN) conducts quality evaluation data for Sri Lankan Development University.

²⁵ UGC. Institutional Reviews 2019 conducted by the Quality Assurance Council University Grants Commission, Sri Lanka [Z]. Asia Pacific Quality Network (APQN) conducts quality evaluation data for Sri Lankan Development University.

be carried out; (2) Establish an information collection and management system (MIS). Through the information collection and management system, classroom records, teacher teaching, student information, and administrative decision-making can be collected and sorted, and different evaluations for each student can be formed based on a large amount of data; (3) a diverse educational environment. In terms of facility construction and resource sharing, taking into account the needs of individual students and the diversity of student groups, consider diversified needs in the construction of facilities such as student resource centers and career planning guidance.

2.2.3. Attach importance to the design and implementation of open and distance courses. Curriculum design and implementation are the key factors for the quality of education. Therefore, the quality of the development and implementation of open and distance courses has been guaranteed from various aspects in various indicators: (1) The sustainability of curriculum development. When developing a course, the developer needs to ensure that the course is sustainable in the open and remote mode, and provide corresponding evidence to be able to implement the course; (2) Improve learners' classroom participation. In the process of course design, we should make full use of distance education technology and teachers' ICT capabilities to enable every student to participate in the classroom in various ways. (3) Use evaluation to promote teaching and evaluation to promote learning. In the course of course design and implementation, we pay attention to the collection of teaching records and other corresponding materials of teachers and students in the classroom, and establish an evaluation system based on the materials, and use classroom evaluation to promote the quality of education of the course itself, teachers, and learners²⁶.

3. Evaluation and reflection with the characteristics of distance education

3.1. Expert training based on distance education

The quality assurance system based on the open and distance learning model needs to be implemented by staff and evaluators with corresponding specialties. Therefore, when the Open University of Sri Lanka conducts internal quality assurance in the later period, it has conducted systematic expert training for personnel involved in all aspects of the quality assurance system. Since most of the evaluation experts are high-quality talents trained under traditional education, they have relatively little understanding of open and distance learning models, so it is necessary to train evaluation experts. The training content mainly includes two aspects: (1) Organization and management experience of open and distance learning institutions. Evaluation experts need to understand the management of open and distance learning first, and also need to understand the theoretical knowledge and practical experience of the open and distance learning model itself, in order to further "assess" its quality²⁷. (2) Quality standards and guarantee professional knowledge. In addition to a basic understanding of the internal institutions, experts also need to have an in-depth understanding of professional knowledge of quality assessment, especially assessment knowledge based on open and distance learning models.

3.2 Continuous improvement of the distance education system

Learning support service is a distinctive feature that distinguishes distance education from other education. As an important component of distance education, it develops along with the development

²⁶ OUSL. Self-Evaluation Report (Institutional Review 2019) [Z]. Asia Pacific Education Quality Assurance Organization (APQN) carried out quality evaluation materials for Sri Lanka Development University (internal).

²⁷ OUSL. Self Evaluation Report (Institutional Review 2019) [Z]. The Asia-Pacific Education Quality Assurance Organization (APQN) carried out quality assessment materials for Sri Lanka Development University (internal).

of distance education²⁸. After the evaluation, the Open University of Sri Lanka has further improved the support services in its distance education system, which mainly include the following points.

3.2.1 Reinforcement of distance education facilities: three regional center networks. The Open University of Sri Lanka has established three regional network centers in Badulla, Kurunegala and Ratnapura, further strengthening the regional center network of the Open University of Sri Lanka. Through the strengthening of the regional network, its coverage of learners is wider, the network service signal is enhanced, and the supporting service technology is more diverse, so that it can further face a larger number of learners and provide a complete and more convenient remote educational technology.

3.2.2 Distance education staff training: CTHE plan. Curriculum and management under the open and distance learning model require teachers and learners to have high information literacy and be able to use distance education technology to learn knowledge more proficiently. Therefore, in order to ensure the quality of education, the Open University of Sri Lanka has established a "Certificate of Teaching in Higher Education" in the Faculty Development Center (SDC) in order to train senior scholars and administrators in the university system participating in open and distance learning evaluation. "(CTHE program for short) hybrid distance courses, this program is mainly dedicated to improving the ICT capabilities of teachers and learners, mainly including open and distance learning methods and related research training.

3.2.3. Distance education curriculum development: MOOC and OpenCast. In order to further improve the open and distance courses, the Open University of Sri Lanka is further committed to the design, development and implementation of distance courses, while studying how to integrate the existing distance education technology with distance courses. (1) Provide a relatively complete MOOC course. MOOC courses began to develop rapidly with the improvement of online technology at the beginning of the 21st century. After the evaluation, the University of Sri Lanka further introduced and improved MOOC courses to provide learners with higher quality and diversified education; (2) launched an internal university Course OpenCast. The Open University of Sri Lanka has opened its special university course channel "OpenUTube" on the YouTube video website, and launched a series of "OpenCast" courses within the university.

3.2.4. Sharing of open educational resources: OER policy. Open and distance learning models are inseparable from efficient resource sharing. In order to further promote the sharing of learning resources, the Open University of Sri Lanka has adopted the Open Educational Resources Policy (OER), which can guarantee the openness of the educational resources of Sri Lankan universities to a certain extent and improve the availability of educational resources. At the same time, the Open University of Sri Lanka is also the first university in the country to adopt this policy.

In addition, the Open University of Sri Lanka has also established a brand-new network conference system through the Big Blue Button distance education platform (BBB), and improved the distance education system based on the OER policy by adopting a new teaching material development model, and achieved good results.

²⁸ Tang Wen, Zuo Kejun, Zhang Da. Open University Learning Support Service and its Ways to realize value[J]

4. Conclusion

UGC has developed a quality assurance system for Sri Lanka's development universities and other institutions that focus on open and distance learning, combining the characteristics of open learning and distance education to form a quality assurance system that is different from traditional education. The development of distance technology, the improvement of ICT capabilities of faculty members, the further acceptance of distance education by the public, and the spread of lifelong learning concepts all indicate that openness and distance learning will become one of the future development trends. The Open University of Sri Lanka has achieved certain results in improving the quality of distance education, and its measures are worth learning from China's higher education institutions.

Author's Bio



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Shift in Academic Quality and Teaching Framework During COVID 19

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Abstract

The four principles of teaching framework namely intellectual quality, relevance, supportive environment, and recognition of differences were the major focusses on academic, personal, social, and constructive agendas in students. During classroom teaching teachers are serious about deep understanding of important concepts through meaningful learning, experiences that occur in supportive learning environment. The classroom teaching has become an integral part of education for teacher and students. In opinion of students' classroom teaching is the backbone of education and no effective alternative to be employed over it, occasionally or for specific purposes. An attempt has been made to focus on merits and demerits of online teaching over the classroom teaching in Akola city has been analysed with objectives to study effect of shift in teaching methods, responses, and the relation between dimension of teaching. The present study is based on primary data collected from students studying in Akola city. The study concluded students have more inclination towards offline teaching. For the online teaching of students, the variables intellectual quality, relevance, supportive classroom environment and recognition of differences are significantly positively correlated with each other while these variables did not find any significant positive correlation with the offline teaching variables.

Keywords: intellectual quality, relevance, supportive environment, recognition of differences

1. Introduction

COVID-19 virus new strain is the change through mutation which the new variant of virus has overcome. This virus spreads easily from person to person and causes mild or severe diseases in people, changes the effectiveness of COVID-19 vaccines. The signs of this virus include cough, fever, pain, impaired sense of smell. Studies reported that virus can easily escape immune deficiency present among some vital organs and attack in more impactful way. The other symptoms are hearing loss, muscle pain, skin infection and vision disorders. Most of the vaccines have been experimentally made which did not have much evidence to suggest that they would ensile the efficiency against the variants. Variants can cause severe infection much like the original strain. Hence the vaccination efficiency remains incomplete and poor adherence to COVID variant. Hence in this situation administration is trying its best to secure every individual by following hygiene, hand washing, social distancing, mask wearing however the education during this situation has been adversely affected as face to face meet between the teacher and students remained dream during 2020 - 2021. Almost all teachers conducted their classes online through the expectation from students to attend. However, considering the access to smart technology along with internet facilities for the student especially at the remote areas, how it has been successful it remained topic of debate. Efficiency of the implementation of vaccine was not duly focused resulting in online education mode and thus keeping the dream of offline classes for teachers and students.

The four principles of teaching framework namely intellectual quality, relevance, supportive environment and recognition of differences were the major focusses on academic, personal, social and constructive agendas in students. These pay a service for important growth and development amongst the students. During classroom teaching teachers are serious about deep understanding of important concepts through meaningful learning, experiences that occur in supportive learning environment. Values diversely elaborates these principles of framework. The classroom teaching has become an integral part of education for teacher and students. In opinion of students' classroom teaching is the backbone of education and they did not find any effective alternative to be employed over it, occasionally or for specific purposes. The other methods of teaching which includes conducting classes online as demonstration at latter stage for the students by teacher may help in concept clarification for the students after classroom teaching. Hence for the teachers and student's classroom teaching is integral part of education. Contents from the syllabus can only be really addressed in class teaching as teacher is one to teach it by reading the faces of students rather than bringing some new brilliant ideas in teaching. On the contrary online teaching has least preference to the students faces and their understanding. Majority of the things are covered as teacher desires with no concentration on the students. Hence the participation of students is only assured and not stressed. If it continues for a longer time or for all the 3 years of degree course many concepts or the methods may be beyond scope of students. Hence the use of online teaching dimension is just a good way of creating base for teaching however it may not have ever lasting effect. The two main arguments developed from the observation on online teaching and offline teaching are online teaching creates the framework for teacher and teaching methods which has least botheration for the students. While on the other hand the existing program of offline teaching trusted and confirmed across the years has students' orientation as students is at center of the teaching.

In view of it an attempt has been made to focus on merits and demerits of online teaching over the classroom teaching in Akola city has been analyzed and findings are discussed.

2. Objectives of the study

- a. To study the effect of shift in teaching methods during COVID 19.
- b. To know the responses of students towards shift in teaching methods during pandemic situation.
- c. To study the relation between dimension of teaching.

3. Hypothesis of the study

Ho: - Classroom teaching will be preferred by students over online teaching.

Ho: - Shift in teaching methods will be a hurdle in teaching quality.

Ho: - Dimensions of teaching will be significantly related in online teaching and offline teaching.

H1: - Classroom teaching will not be preferred by students over online teaching.

H1: - Shift in teaching methods will not be a hurdle in teaching quality.

H1: - Dimensions of teaching will not be significantly related in online teaching and offline teaching.

4. Methodology

The present study is based on primary data collected from Undergraduate (UG) to Post graduate (PG) students studying in various degree programs in Akola city. Google questionnaire was circulated amongst the students to receive the responses. Responses were scored on 5-point scale and sample of 15 undergraduate (UG) and 15 Postgraduate (PG) students studying in Akola city were selected for the study. The separate responses received from each student for online teaching as well as offline teaching were classified and analyzed for presentation. Simple tabular analysis, t-test and Karl Pearson correlation coefficient methods were used for data analysis.

5. Result and discussion:

The data collected from google form was tabulated on excel worksheet. The scores for four main parameters of study i.e., intellectual quality, relevance, supportive classroom environment and recognition of differences. Based on sub questions the mean and standard error values for each parameter under study are presented in the following table. The difference between the mean has been tested with the help of t test and the means, standard error and t values for the score assigned by undergraduate (UG) students presented below concluded that scores assigned by the undergraduate students for offline teaching i.e., classroom teaching has significantly higher scores for all the four parameters of study than for online teaching showing that the undergraduate students are more inclined towards classroom teaching than online teaching. It might be due to the lack of infrastructure available for online teaching i.e., internet connectivity and availability of personal computers, laptops, and the teaching environment also which is completely available in classroom teaching. Classroom teaching is of interactive mode hence students may have inclination towards classroom teaching.

Table 1: T values for online and offline teaching responses undergraduate students

Particulars	Values			
MEAN	270	174	234	239
SD	18	11.6	15.6	15.93333
SE	4.651163	2.997416	4.031008	4.11714
T value	4.94043**	5.1033**	5.43849**	3.53245**

(For 5 % level of significance *, For 1 % level of significance **)

The following table presents the mean values and standard error for postgraduate students obtained for online teaching and offline teaching. All the four parameters of study were used in the Google form of PG students also. The main values differ significantly for classroom teaching than the online teaching confirming post graduate students are also highly inclined towards offline teaching i.e., classroom teaching than online teaching. The findings concludes that the respondent students are completely inclined towards classroom teaching. And have preference only for classroom teaching.

Table 2: T values for online and offline teaching responses undergraduate students

Particulars	Values			
MEAN	236	152	220	212
SD	15.73333	10.13333	14.66667	14.1333
SE	4.065461	2.618432	3.789836	3.652024

Z	4.49267**	5.11132**	2.15**	3.381553**
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(For 5 % level of significance *, For 1 % level of significance **)

Table 3 presents the Karl Pearson correlation coefficient values between all the four parameters for online teaching and offline teaching classroom teaching for undergraduate students. The significance of correlation coefficient was tested at 5% and 1% level of significance and accordingly ‘*’ and ‘**’ are assigned. Table values of correlation coefficients were compared with the calculated values for their significance. The figures presented in table 3 arrive to the conclusion that

Table 3: Correlation between variables under study for undergraduate students

UG								
	Column 1	Column 2	Column 3	Column 4	Column 5	Column 6	Column 7	Column 8
Column 1	1							
Column 2	0.612935*	1						
Column 3	0.74017**	0.78234**	1					
Column 4	0.76038**	0.402503	0.519518*	1				
Column 5	0.234842	0.09572	0.027623	0.225024	1			
Column 6	0.04941	0.04922	0.28603	0.02218	0.69266**	1		
Column 7	0.155132	0.11449	0.00315	0.224587	0.85587**	0.732573***	1	
Column 8	0.086427	0.13692	0.09855	0.209674	0.87162**	0.860809**	0.886036**	1

the parameters for online teaching i.e., intellectual quality, relevance, supportive classroom environment and recognition of difference was significantly positively correlated with the relevance, supportive classroom environment and recognition of difference. Relevance was positively correlated with supportive classroom environment and supportive classroom environment with recognition of differences indicating the variables under study are inter correlated. The coefficient values for offline teaching indicated that intellectual quality was significantly positively correlated with relevance, supportive classroom environment and recognition of differences. Identically relevance and supportive classroom environment as well as supportive classroom environment and recognition of differences were positively correlated.

The above description concludes that all the four variables under study i.e., intellectual quality, relevance, supportive classroom environment and recognition of differences are positively correlated with each other i.e., these variables cannot be studied independently.

Table 4 present the values of Karl Pearson correlation coefficient between the variables under study for postgraduate students. The four variables intellectual quality, relevance, supportive classroom environment and recognition of differences were included in the study. The values for online teaching and offline teaching are presented in the table.

Table 4: Correlation between variables under study for postgraduate students

Ongoing through the table following observations are recorded intellectual quality, relevance, supportive classroom environment and recognition of differences these variables are significantly positively correlated indicating intellectual quality has significant positive effect on relevance, supportive classroom environment, recognition of differences. The variables relevance, supportive classroom environment and relevance, recognition of differences and supportive classroom environment, recognition of differences are significantly positively correlated.

The data on offline teaching also recorded identical findings i.e., intellectual quality variable was positively correlated with the relevance, supportive classroom environment and recognition of

PG	Column 1	Column 2	Column 3	Column 4	Column 5	Column 6	Column 7	Column 8
Column 1	1							
Column 2	0.66744* *	1						
Column 3	0.74408* *	0.75128* *	1					
Column 4	0.83924* *	0.73629* *	0.92468* *	1				
Column 5	0.28824	0.085303	0.32829	0.33883	1			
Column 6	0.3818	0.119	0.22006	0.21716	0.70147* *	1		
Column 7	0.22435	0.10012	0.43331	0.38139	0.81584* *	0.68467**	1	
Column 8	0.50449	0.04911	0.59428* *	0.54275 *	0.77070* *	0.543287* *	0.817622* *	1

differences. The variable relevance has significant positive effect on supportive classroom environment as well as recognition of differences. Supportive classroom environment and recognition of differences are also positively correlated with each other.

It is to point out that for undergraduate students and postgraduate students the variables for online teaching and as off for offline teaching did not find any significant positive correlation with each other. The above table concludes that all the four variables under study are intercorrelated with each other.

The hypothesis of the study stated as,

H₀: - Classroom teaching will be preferred by students over online teaching.

H₀: - Shift in teaching methods will be a hurdle in teaching quality.

H₀: - Dimensions of teaching will be significantly related in online teaching and offline teaching.

Are accepted based on the above findings.

4. Conclusions of the study

From the above discussions the following conclusions can be stated:

- The undergraduate and postgraduate students have more inclination towards offline teaching i.e., classroom teaching.

- For the online teaching of undergraduate and postgraduate students the variables intellectual quality, relevance, supportive classroom environment and recognition of differences are significantly positively correlated with each other.
- The variables intellectual quality, relevance, supportive classroom environment and recognition of differences for offline teaching for undergraduate and postgraduate students did not find any significant positive correlation with the offline teaching variables.

All the three null hypotheses are accepted.

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Stopping Fake Certificates and Transcripts – Is Digital and Blockchain Technology the Answer?

Alan Go

Lead Strategic Researcher, Eduvalue Singapore

Abstract

This paper focused on the issue of fake certificates and how digital technology can be used to resolve the issue. Education institutions worldwide still physically print and distribute certificates. These certificates are easily forged and fake certificates are a multibillion-dollar industry. This has led to a massive issue in many countries where potential employees submit fake certificates to employers and spurred stakeholders from the educations, corporations, recruitment agencies and governments to actively seek solutions. Although, universities have used various preemptive measures such as water marks on certificates, to more advanced monogram makers and digital images, the fake certificates industry prevails. The COVID-19 pandemic is making e-learning the new normal, this in turn fuels more educational fraud as online qualifications are being accepted as a new norm of attaining qualifications. With the recent innovation in digital technology, the Blockchain technological platform has been gaining interest. Blockchain is- a concept that is used by Bitcoin in 2009 to launch the world's first cryptocurrency application where people can trade virtual currency in a highly secured and trustable platform with features of immutability, reliability and decentralization of transactions. The main advantage of Blockchain is security as data entry made by humans will exist in perpetuity and no crossing out any original transactions are allowed as long as the Internet exists. Blockchain concept has gained traction with innovative tech companies who have created different Blockchain platforms that could be used for other business applications to manage all kinds of company assets, including stopping fake certificates. This paper explores how Blockchain applications should be considered as a noteworthy solution to significantly reduce circulations of fake certificates globally.

Keywords: Blockchain, Fake Certificates, Digital Certificates

1. Introduction

Fake education certificates can be easily obtained from websites selling fraudulent certificates from all types of education institutions and programs. There are established criminal organizations that create and sell fake certificates. Some of these organizations even set up illegal establishments that verify fake certificates that were issued and respond to employers by indicating that the person is a bona fide graduate of the respective institution.

The rise of fake certificates has brought on a whole host of issues. Many corporations have limited resources to verify the legitimacy of a job candidate's certificate; the employer risks hiring someone that has fake qualifications and this can pose significant threats in some jobs like doctors and commercial pilots where they are entrusted with the lives of the public. In 2017, three foreign nationals were each sentenced to 10 weeks jail for submitting forged academic certificates when they applied for work passes in Singapore (Todayonline.com, 2017). It takes time and resources to verify qualifications with universities and education institutions, and these resources are wasted to check fake certificates.

2. Examining the limitations of physical education certificates

In 2015, one of the biggest players of fake certificate, Axact, a Pakistan-based IT firm was exposed to have over 100 fake online schools and accreditation bodies connected to them (Szeto & Vellani, 2017). Fake certificates are a multibillion-dollar industry; where each certificate is sold anywhere from a few thousands of dollars to as much as upwards of 30,000 dollars, depending on types of awards and how elaborate the “real-fakes” are dictated by the cheaters. Physically printed certificates have five issues:

1. Certificates are exposed to the dangers of counterfeiting that could affect accreditation and evaluations of legitimate programs
2. Physical certificates incurred significant resources such as manpower, time, preparations, printing, and issuing costs
3. Paper certificates have limited protection against natural elements over the years
4. Paper certificates needs time to be replaced should the need arises
5. Employers take time to verify certificates of job candidates

2.1. Solutions currently used to stop fake certificates

Legitimate education institutions have been trying to find solutions to counter the issue of fake certificates. The most commonly implemented solution is to print certificates with security water-marks or monogram marks. Others have look at using different technologies. For example, in 2011, 30 Universities in UAE reported used Radio Frequency Identification (RFID) to store information on labels enabling the verification of certificates using a smart document reader (University World News, 2011). Hague Australia’s PremierCert+, an Australia company, has a system to manage securely certification documents online where various stakeholders can access certificates to keep the integrity of qualifications while reducing operational costs (Hague Australia, 2017). While these are valiant efforts, these technologies are still managed by humans and the risk of counterfeiting remains a concern.

Other recommendations include tracking down and prosecuting people who offers “ghost” writing services for academic research papers, develop close network by collaborating with specialized certificate verification firms, increase power of regulatory bodies responsible for the verification of academic degrees, and create tougher legislation that provides stricter punishment of forgery and encourage employers to look beyond an academic qualifications of a job applicants (Suwaidi, 2019). The world is searching for a solution, and it seems the notion of using Blockchain technology to reduce or stop fake certificates has gained significant interest from education establishments, governments, and innovative entrepreneurs.

3. COVID-19 pandemic may increase online fake qualification offerings as e-learning becomes a norm

A report by Study International indicated that there were 110 million Massive Online Open Courses (MOOC) learners in 2019 (excluding China) compared to 101 million in 2018”, and cited Business Insider’s research that there are about 350 fake online universities issuing approximately 200,000 fake online degrees (Study International, 2020).

The World Economic Forum in several studies reported that COVID-19 is “a catalyst for educational institutions worldwide to search for innovative solutions” as the traditional methods of teaching in academic institutions were no longer feasible. The COVID-19 pandemic has resulted in over 1.2

billion students having to take e-learning lessons. Research also indicated that with the use of the right online learning technology, learners actually retain 25-60% more materials compared to only 8-10% in a face-to-face instruction mode, yet requires 40-60% less time to learn. This is attributed to the fact that online learning encourages higher independency and self-study accelerating through knowledge and concepts as students learn at their own pace (World Economic Forum, 2020a, World Economic Forum, 2020b).

COVID-19 has also pushed governments around the world to speed up the retraining, reskilling and upgrading skills of workforce in order to adjust to new economic structures and workforce agility needed for the post-pandemic changes (OECD, 2021). This need to train the workforce fast coupled with the new found e-learning habits of learners globally, indicate a growing acceptance of the online learning model as people are gradually getting used to the advantages and legitimacy of e-learning mode of education. COVID-19 has also brought about the rise in “cheating services” in universities. The UK alone sees “homework help” and “essay mills” operations increase to 932 from 881 in October 2020 to help in students’ assessments as programs are moved online (The Guardian, 2021).

It is inevitable that more learners as well as employers will trust certificates issued by e-learning instructional mode. With COVID-19, more employers also lower their guard against certificates issued online and this may fuel the fake certificates industry as learners’ source for more online qualifications.

4. What is Blockchain?

4.1. The Bitcoin stories

Cryptocurrencies have garnered much attention since the launch of Bitcoin in 2009 based on the Blockchain technology. According to Steve Wilson for Constellation Research, Blockchain is a decentralized Distributed Ledger Technology (DLT) that was invented to support the Bitcoin cryptocurrency, the founder of Bitcoin, Satoshi Nakamoto “envisioned people spending money without friction, intermediaries, regulation or the need to know or trust other parties” (Wilson, 2017). By the year 2015, Bitcoin market cap reached an estimated USD 12 Billion and had attracted close to USD 1 Billion in venture capital funding (Eyal, Gencer, Sirer, & Renesse, 2016), the product generated lots of interest, and many individuals have since made and also lost lots of money from trading the virtual currency. Although, the Bitcoin market cap has dropped to about USD10.9 billion (CoinMarketCap, 2018) at the time of writing this paper, the technology behind Bitcoin - the “Blockchain” and its evolution of advanced ledger technologies and cloud computing has gained significant interest in the tech and business world.

4.2. The technology behind Bitcoin

An article by Financial Reviews offers one of simplest explanations on Blockchain, “it is a form of shared record book that contains line items that is not centrally managed but thousands of copies of the record book can be stored on home and business computers globally. In order to transact, a wallet address equivalent of user account details is needed, when someone enters a new line item or transaction, this line item will be updated to hundreds of other computers who have a copy of the record book; Those computers confirm that this transaction is authorized,” and “ultimately they agree (or disagree) that everything about the transaction is legitimate before giving that line item a tick of approval. It has to match up perfectly on every copy of the record”. In addition, “every line entry

made will exist in perpetuity, for as long as the internet exists” and no amendments to any original transactions are allowed (Skella, 2017).

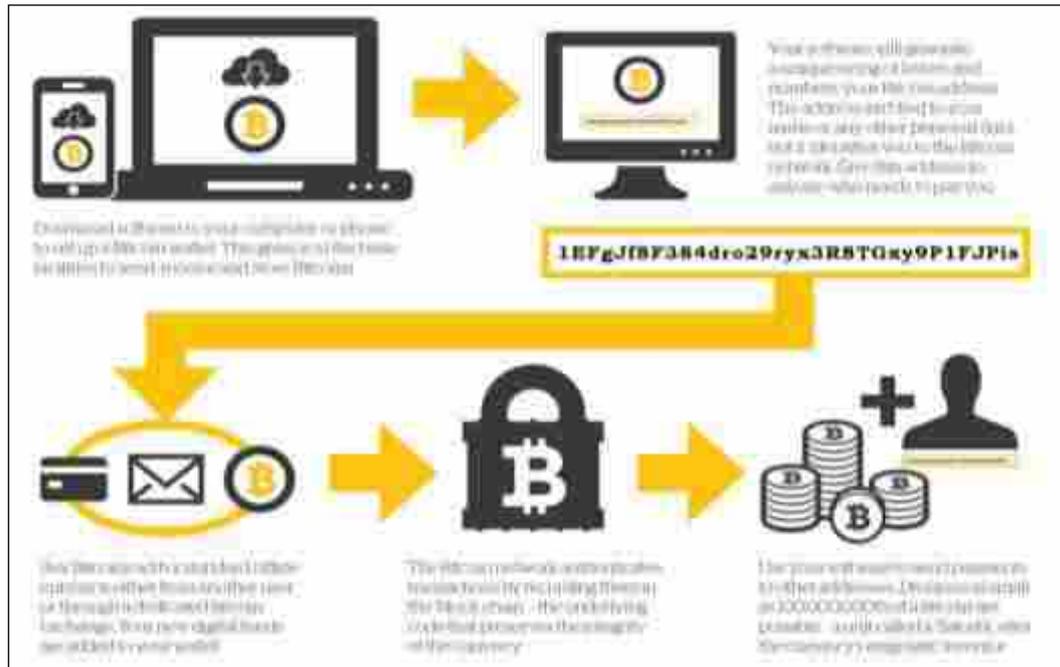


Diagram 1: How Blockchain Works (The Association of Accounting Technicians, 2013)

5. Adoption of Digital technology and Blockchain technology

Digitalization has become a buzzword in the business world. Governments around the world are providing incentives to encourage companies to adopt digital technologies as a way to revitalize economies and increase competitive advantages. According to Steve Ng, Vice-President of Digital Operations and Platform with MediaCorp, one of Singapore’s largest media companies, digitalization is the integration of digital technologies into everyday business activities, and Blockchain projects could be one of the digital initiatives that could be explored as a business application, and “education management of issuing certificates is one of them” (Ng, 2018).

A 2018 Gartner CIO Agenda Survey of 3,160 Chief information Officer (CIO) from 98 countries across all major industries representing about “\$13 trillion in revenue/public sector budgets and \$277 billion in IT spending” where respondents were “categorized as top, typical and trailing performers in digitalization”. The chart below shows that only 1% of the respondents have invested in the technology. Nevertheless, we see a total of 22% doing short-term, medium to long term planning and some actively experimenting the use of Blockchain technology. Gartner survey does not seem to be very encouraging as 34 % of the CIOs show no interest and 43% who are aware has not taken any actions in blockchains as shown in Diagram 2: Blockchain Plans (Gartner, 13 May 2018).

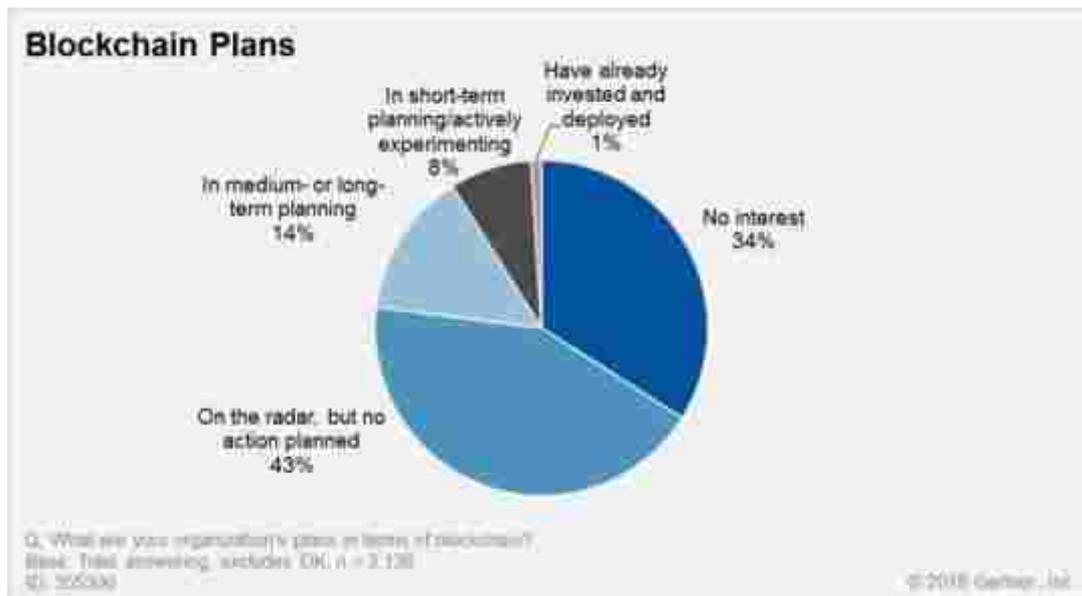


Diagram 2: Blockchain Plans (Gartner, 13 May 2018).

In spite of the less than encouraging results in the survey, there are industries that are already using the technology; leading it are the finance and insurance sectors. According to David Furlonger, Vice President and Gartner Fellow at Gartner Research, “the relevance is in the underlying infrastructure or leverage technology. And once we’ve got a handle on that, if we approach it practically or pragmatically, I think we’ll be able to dispel a lot of the hype that’s in the market right now.” Echoing Furlonger's views, (Ng, 2018) indicated that before embarking on any Blockchain initiatives one should look at the business applications in detail and consider the following:

1. What competitive advantage does Blockchain brings to your business?
2. What would the future Blockchain ecosystem look like for your company?
3. What are the costs and resources needed to build the new business model?
4. What is the longevity of this Blockchain platform?
5. Can we live without Blockchain investments?

According to Wilson (2017) it is the Blockchain’s “immutability, reliability and decentralization has led many to fantasize about applications that extend far beyond cryptocurrency” where enterprising entrepreneurs soon learn that the technology could be applied to all sorts of physical assets, besides cryptocurrencies.

6. Addressing fake certificates with Blockchain

In all the perspectives of understanding Blockchain technology’s ability, the security qualities of Blockchain stands out. Closer examination seems to suggest that stopping fake certificates is possible. Moreover, through addressing fake certificates with Blockchain, organizations will also address other problems associated with paper certificates such as reducing carbon footprint.

6.1. Blockchain as a business application platform

The applications of Blockchain technology are largely based on using distributed ledger technology to build the underlying trust infrastructure of a business system. Although Bitcoin is the first real

implementation of Blockchain with the cryptocurrency applications, the use of Blockchain concept is not limited to just payment transactions (Andoni, 2018). Today, there are many more Blockchain platforms that developers and programmers could use to explore and develop applications across all business functions. There at least 10 different Blockchain platforms, some popular platforms include (newgenapps, 2018):

- **Ethereum:** An open platform for private cryptocurrencies and smart contracts
- **Hyperledger:** A distributed ledger framework in fields of finance, banking, Internet of Things, supply chains, manufacturing, and technology
- **IBM Bluemix Blockchain:** To assist in acceleration of the digital security for corporate governance and operation of multiple business units that run on IBM Cloud
- **Multichain:** To allow creation and running of private Blockchains as compared to open platforms to private enhanced privacy and security by adding a permissions system

Blockchain technology is one of the most talked about technologies; it appears that it is able to offer an array of tools for MNCs, SMEs, and Governments to manage processes in a highly secure and independent working environment to streamline organization’s operations and transfer of assets.

6.2. Blockchain applications in stopping fake certificates

Any kind of document verification such as banking documents, transaction documents including educational qualifications, often involve complex and tedious processes to authenticate. Educational certificates are the most essential proof of a student’s level of qualifications issued by their respective education institutions. As discussed above, there are lots of skillfully created fake educational certificates flooding the market and remains very difficult to differentiate from an original. The credibility of learners (some innocent) and the issuing education authority reputations and trustworthiness are jeopardized.

6.2.1. Education Institute testing Blockchain Authentication System

Blockchain technology has been identified as a good potential avenue for authenticating educational qualifications while being a solution to combat academic and employment fraud. Treating the education certificates like a “contract” would be a way that Blockchain platform can be used to stop fake certificates.

Education institutions have started exploring, testing and deploying Blockchain Authentication System. Three examples cited are shown below (Omar S. Saleh & Rana, 2020):

Education Institutions	Blockchain Authentication System
Knowledge Media Institute (KMI) of the Open University (OU), United Kingdom	Leveraging the use of Ethereum for turning badges into smart contracts Developed a prototype for issuing micro-credentials on the blockchain. KMI activities are focused on creating blockchain for use in UK higher education qualifications and believes the technology will have significant opportunities for educational institutes across the UK.

Universit of Nicosia (UNIC), Cyprus	Using the Bitcoin blockchain for many activities such as accepting bitcoin for tuition for any degree program Issuing academic certificates on Bitcoin blockchain. Educational certificates in the blockchain initiated by the University is aims to eliminate fraud and fraud in payments from international students. The main goal is to overcome the problems of tampering with the numbers of student cohorts.
MIT Media lab USA	Uses Blockcerts to issue digital certificates to groups of students Provide more control to recipients over certificates earned by them. In this initiative, the recipients may not depend on a third party intermediary to store, verify and validate credentials. MIT's certification architecture works on the process of the issuer signing a digital certificate and stores its hash within the blockchain transaction. The output of this transaction is assigned to the recipient.

6.2.2. OpenCerts - A Singapore Government Blockchain technology to produce digital certificates for graduates

OpenCerts is one of the more comprehensive national-level deployments of Blockchain technology by the Singapore government. Since 2019, all employers have been able to use a blockchain-based platform to verify the educational qualifications of employees and job candidates who have graduated from all local universities, polytechnics and other educational institutions where students were issued Digital Certificates.

According to a report by OpenGov Asia – CIO Network (2019), the OpenCerts initiative is a jointed effort by SkillsFuture Singapore (SSG), Government Technology Agency (GovTech), Ngee Ann Polytechnic (NP), and the Ministry of Education (MOE) in support of Smart Nation, to develop deep tech solutions benefiting Singaporeans. OpenCerts aims to provide:

- Secure and authentic certifications verifications system using Blockchain solutions.
- Students will receive digital certificates with unique cryptographic proof embedded within for secure verification.
- No longer need to obtain certified true copies of certificates for job applications and academic admission applications.
- Graduands will be issued digital certificates automatically and populated into a “Skills Passport” that is always accessible using MySkillsFuture Portal and Mobile App

Digital certificates can simply be verified by employers directly through the OpenCerts platform (opencerts.io) as shown in diagram 3 below:

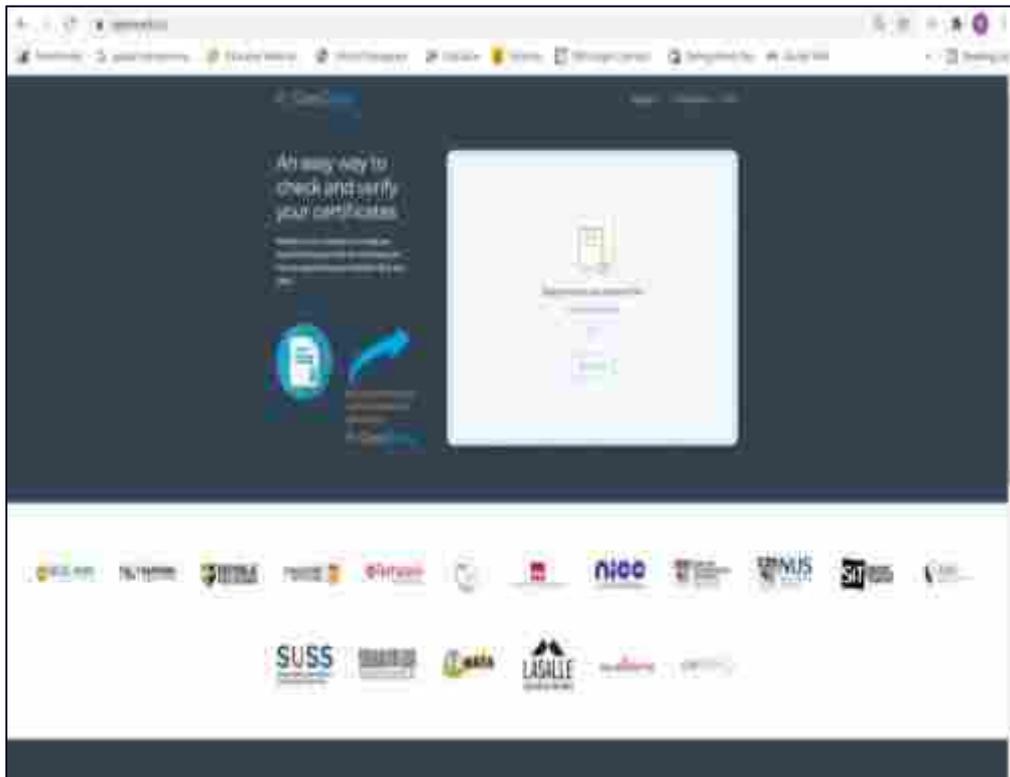


Diagram 3: OpenCerts Platforms (<https://www.opencerts.io/>)

The Singapore Government believes that Digital certificates will save time and costs: Education institutions will save manpower time and costs by not verifying certificates. Students' "Skills Passport" serves as a single digital repository for education and training certificates obtained. This will enable all Singaporeans to track their current skillsets and plan for future skills development. Employers save time and cost by simply checking the certificate data against its code on the blockchain for validity and to detect any signs of tampering.

This automatic verification will simplify and reduce administrative processes and physical paperwork for employers.

7. Digital certificates using Blockchain technology – How it works?

There are several companies in Singapore exploring such applications. In an interview with Barry Aw, founder of EduValue, an education quality assurance consulting firm in Singapore, he mentioned that the company has collaborated with its partner brand, iCosys to produce a fake certificate solution using Ethereum-based Blockchain platform called Digital Certs.

A typical Blockchain ecosystem concepts to stop fake certificates is illustrated as adapted from Aw, (2018) in Diagram 4: Digital Certificate illustrates a situation where a university needs to issue a certificate to a student A, the university entered the graduation details of the student, the information will be broadcasted to all the stakeholders such as dean of school, lecturers, exam boards, external exam boards, graduation boards, school's administration, ministry of educations, recruitment agencies, accreditation agencies etc. Student A's details are approved and validated by all the stakeholders. The student A's "Block" will be added to the "Certificate Blockchain" and copies of the transactions will be shared with all stakeholders.

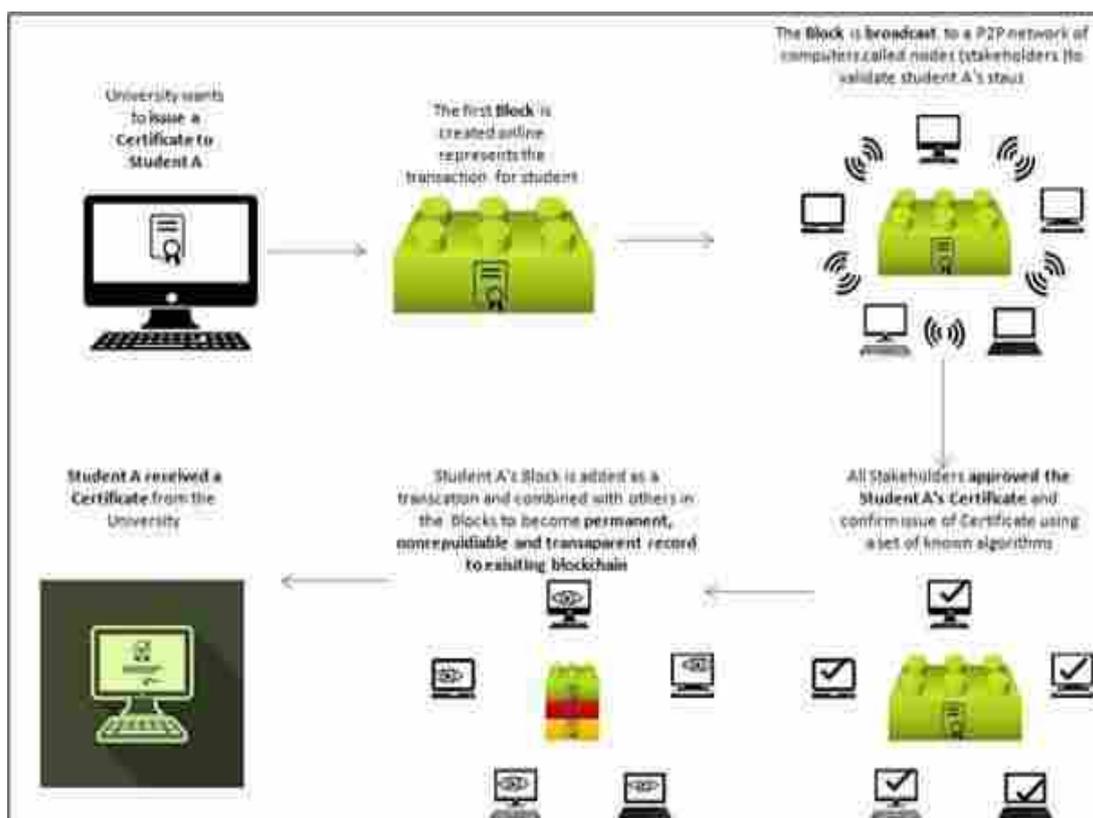


Diagram 4: Digital Certificate

Finally, the student will be given the certificate and transcript electronically and still have the option to have printed copies. A key aspect is no one can change the student A's status and/or amend the information once student A's block is created. Any amendment needs a new "Block" to be created and the process restarts again without overriding the historical data of the student.

According to Aw (2018), a Digital Certificate issued with Blockchain technology will made it hard to be forged as one can verify with certainty that the digital certificate is from the original and authorized source, also verification can be done without any third parties' intervention (avoiding abuse and control). In addition, the record can still be verified even if the issuing authority changes or no longer exist – since the registry of the transactions of these original digital certificates in a blockchain can only be destroyed if there is a total destruction of every copy in thousands of computers that host this technology.

8. Conclusion

One could conclude that using digital and Blockchain applications, we could effectively significantly impact the fake certificate industry. As more enterprising companies such as EduValue continue to refine the solutions, work is still needed to convince stakeholders, some whom still have no idea about Blockchain and that such a solution is possible for a world free of fake-certificates. The COVID-19 pandemic has fueled the increase in educational fraud and it will continue to rise as e-learning evolves as part of the new norm for students.

Costs remain a concern in any new technological adoptions and solutions may have certain shortcomings during implementation. However, educators who understand the benefits of Blockchain technology are supportive of using it to solve fake certificates. Dr Jack Patel, Assistant

Professor with USA Embry-Riddle Aeronautical University's Asia Campus said that "Blockchain technology (due to the multiple internal checks throughout such flow process) would certainly help to increase the reliability, credibility, and efficiency of the entire recruitment process, from start to finish. This digital footprint would also benefit functional aspects such as record keeping and transferability. We would be supportive of this initiative". He further indicated that when the university implements Blockchain technology to qualifications, they need to take into consideration the "maintaining reasonable costs of implementation, ensuring the security of stored information and a high adoption rate/transferability across educational institutions" (Patel, 2018).

It is highly possible that there will come a day where all public and private universities, education and training institutions, government and statutory boards, employers and recruitment agencies come together to be part of a "Qualifications and Education Certificates Blockchain" community. Education institutions should start adopting the technology to ensure their authenticity of their awards; it may take time for application providers to convince all stakeholders, especially Ministry of Educations, to support the ideas and make it mandatory to participate in such ecosystem (similar to a financial credit bureau). Blockchain platform is a workable solution to stopping fake certificates world-wide.

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Literature Review on Evaluation of Blended Teaching Quality in HEIs

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Abstract

Since the outbreak of COVID-19, the teaching methods of colleges and universities have undergone great changes, that is, online teaching has gradually been accepted by the public, which a new opportunity for a hybrid teaching model combining online and offline in colleges and universities in the post-pandemic era. In order to know the research status of evaluation of blended teaching quality in the post-pandemic period in China, this paper demonstrates it from three aspects. Firstly, the paper explores the important topics from the trend of publication, finding that the evaluation design and evaluation index construction of blended teaching are the two major topics. Secondly, deeply discussing the two essential topics, the paper finds that there are some problems in the research topics, such as single subject and one-sided content. Finally, based on the analysis of the topics' problems, the paper intends to design the process model of hybrid teaching quality and the corresponding evaluation index in colleges and universities, to provide for providing a relative process model and index construction for the related research of hybrid teaching quality evaluation.

Keywords: blended teaching; teaching quality evaluation; teaching evaluation design; teaching evaluation index; teaching evaluation process model

1. Introduction

Blended teaching is a new teaching product of the modern information technology applied in high education, which could achieve the integration of online individual development and offline interaction between teachers and students. However, it only stays at the cognitive level and has not been applied into practice until the COVID-19. In the pandemic period, many colleges and universities try to teach on line. It is online teaching that changes the way of students' learning and teachers' teaching, which lays a foundation for the new blended course teaching in colleges and universities. *The Horizon 2021 Higher Education (Teaching and Learning)* points out that new hybrid or blended teaching model will have a profound influence on higher education.^[29] And a new research has found that 83% college teachers are more willing to apply online teaching or blended teaching mode to curriculum in the post-pandemic era, and students are more satisfied blended teaching mode than ever.^[30] Therefore, how to build a hybrid teaching evaluation system in colleges and universities and improve teaching quality, is particularly important. This study will explore the development of hybrid teaching quality evaluation in colleges and universities based on CNKI, and then summarize the important characteristics and some shortcomings of the research on teaching evaluation of hybrid courses and evaluation index. And last, the paper intends to design the process model and index construction of hybrid teaching quality evaluation.

^[29] Lan, G. S., & Wei, J. C. et.al. *Future higher education teaching: Macro Trends, Key Technology Practices and Future Development Scenarios -- Key Points and Reflections of Horizon Report 2021 (Teaching Edition)* [J]. Open Education Research, 201,27(03):15-28.

^[30] Zhao, J.W. *Research on reconstruction of mixed teaching mode based on OBE*[J]. Jiangsu Science and Technology Information, 201,38(24):78-80.

1.1. Historical Development of Blended Teaching Quality Evaluation in Colleges and Universities

The historical development of blended teaching quality will be illustrated by the two parts of concept and evaluation trend.

1.1.1. Concept of blended teaching quality evaluation in colleges and universities

“Blended teaching” put forward by American scholars Smith J and Elliott Masiere in 2002, mainly refers to the combination of traditional teaching and online teaching by technology.^[31] “Blended teaching” was first proposed in China by Professor He Kekang of Beijing Normal University. He pointed out that hybrid teaching is based on constructivism theory to combine the traditional learning and digital learning, achieving digitalization and high efficiency of classroom teaching.^[32] In addition, some scholars explain the hybrid teaching based on four aspects of teaching space, methods and evaluation: teaching space refers to the combination of online and offline learning freedom; teaching method refers to the integration of traditional teaching and modern teaching; teaching evaluation refers to the combination of summative evaluation and formative evaluation.^[33]

Based on this, hybrid teaching in colleges and universities can be understood as the application of network technology in traditional courses to achieve student-centered, free teaching space, integration of teaching methods, and multiple teaching evaluation of online and offline co-existence and integration.

Teaching quality evaluation is a way of improving teaching quality by using scientific methods to evaluate objects, teaching process and achievements based on teaching objectives. Niu Chuanrong and Wang Tao (1998) divides teaching evaluation into teaching evaluation objectives, objects and methods based on the modern teaching evaluation view. The objectives of teaching evaluation can be divided into diagnostic evaluation, formative evaluation and summative evaluation; the object can be divided into students, teachers and teaching process; the methods can be divided into four categories of lectures and tests, teachers and students’ self-evaluation, formative evaluation and summative evaluation, and fact description and value judgment.^[34] Xu Chaofu and Jiang Jicheng (2005) explores the diversified evaluation from seven aspects of concept, value orientation, standard setting, content, subject, function and method based on the background of popularization. It points out that the subjects are divided into teachers and students, teachers’ peers and education experts, education administration and social personage, therefore the corresponding evaluation objects are teachers and students, teacher teaching and classroom teaching system; the methods can be divided into four types of self-evaluation and other evaluation, formative evaluation and summative evaluation, quantitative evaluation and qualitative evaluation, humanistic evaluation and scientific evaluation.^[35] Based on the literature, teaching evaluation research can be discussed from the evaluation subject (evaluation object), evaluation method, evaluation content and other aspects.

1.1.2. Evaluation trend of blended teaching quality in colleges and universities

Since the outbreak of COVID-19, Chinese universities have gradually tried the construction of hybrid curriculum. By searching the keywords of “blended teaching” “teaching evaluation” “blended

^[31] Zhang, Y. Y. *Action Research on classroom Reform of blended teaching in information Age*[J]. Vocational Education (Mid-day), 201,20(01):44-47.

^[32] He, K.K. *A Study on the Theory of Educational Technology by Blending Theory Learning (PART 1)*[J]. China Electronic Education,2004(03):5-10.

^[33] Zhang, J., & Du, S. R. *The Connotation, Value Appeal and Implementation Path of Blended Teaching*[J]. Teaching and Management,2020(09):11-13.

^[34] Niu, C. R., & Wang, T. *A Comparative Study of Traditional Teaching Evaluation and Modern Teaching Evaluation* [J]. Journal of Harbin Teachers college (Social Science Edition),1998(03):65-67.

^[35] Xu, C.F., & Jiang, J. C. *Diversification of Classroom Teaching Evaluation under the Background of Popularization* [J]. Journal of Hunan University of Humanities and Science,2005(01):65-70.

teaching quality” and “blended teaching evaluation” on CNKI, 421 journal papers are obtained, distributed according to year (See Figure 1).

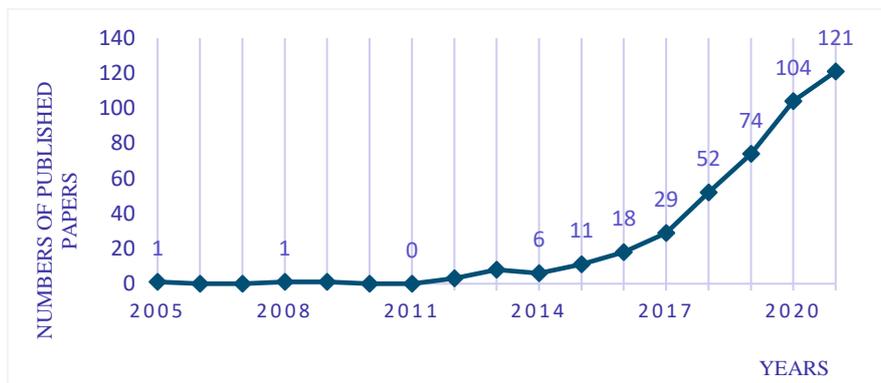


Figure 1. Annual Distribution of Literature Published on Blended Teaching Quality Evaluation (2005-2020)

As can be seen from the figure, the development of blended teaching quality evaluation can be divided into three stages of the embryonic stage (2005-2013), the preliminary development stage (2014-2018) and the rapid development stage (2019-present).

1.1.2.1. The embryonic stage (2005-2013): theoretical research on blended teaching quality

At the beginning of the 21st century, the hybrid teaching model emerges. There is only one paper published from 2005 to 2011. With the development of the research on blended teaching in China, the research has been concerned since 2012. In this embryonic stage, the paper mainly focuses on theoretical study. For example, Lin Fang and Lin Nan (2012) builds models of teachers’ teaching, students’ learning and teaching equipment based on the systematic scientific feedback model and growth ceiling model for improving the quality of mixed teaching.^[36]

1.1.2.2 The preliminary development stage (2014-2018): design of blended teaching evaluation

With the development of theoretical research on blended teaching quality, there have been 52 articles published about blended teaching quality by 2018. At this stage, the researchers focus on how hybrid teaching model could apply to the construction of colleges and universities, in which the hybrid teaching evaluation design research appeared on. He Zhiquan and Chen wei(2016) applies the blended teaching to the curriculum of human body, and investigates students’ learning and teachers’ teaching effect based on formative assessment.^[37]

1.1.2.3. The rapid development stage (2019-present): blended teaching quality evaluation

Since the outbreak of the COVID-19, most offline courses have been transferred to online teaching, which lays a foundation for the popularization of new hybrid teaching. The number of articles about blended learning has reached 121 since 2019. At this stage, colleges and universities in China have begun to build hybrid curriculum teaching, but how to build a high-quality evaluation system for hybrid teaching has been stressed and paid more attention. Therefore, many research paper in this time mainly focus on evaluation system, evaluation index construction, curriculum teaching evaluation design and others.

^[36] Lin, F., & Lin, N. *Research on quality Improvement of Blended Teaching Mode Based on SD.*[J] Education and Career,2009(36):69-71.

^[37] He, Z.Q., & Chen, W. et.al. *Discussion on the Application of Formative Evaluation in the Blended Teaching of Human Anatomy* [J]. Basic Medical Education,2016,18(04):255-259.

2. Research on Evaluation Design of Hybrid Teaching Curriculum

One of the current topics of hybrid teaching quality evaluation in colleges and universities focus on course evaluation design. This part will analyze the current research literature status and discuss the characteristics and shortcomings of it.

2.1. The status quo of research on evaluation of hybrid teaching curriculum design

Based on the essential characteristics of online and offline connection of hybrid teaching, most literatures design the course evaluation standard of hybrid teaching by taking a course as a case (see Table 1).

Table 1. Dimensions of Blended Teaching Curriculum Evaluation Design of Part of Literature

Year	Author	Subject of Evaluation	Methods of Evaluation	Evaluation content	
				Online assessment	Offline assessment
2020	Yang Xue, Wang Peng	Student	Formative Evaluation	Online tests; Teaching resources; Number of online clicks; Student (or teacher) evaluation; Completion of online homework	Completion of offline homework; Final examination.
2021	Deng Juan, Zhou Bing	Student	Formative Evaluation	Group task; Material reading; Online discussion; Completion of videos; Homework submission Chapter tests or learning times	Student attendance; Offline check-in; Classroom learning; Performance
2020	Lv Weiyang, Song Yunna	Student	Formative Evaluation		Written homework; Individual performance; Group or final homework
		Teacher	Formative Evaluation	Teaching state; Teaching interaction; Knowledge explanation; Teaching content and methods	
2020	Peng Caiwang, Sun Chaoran et al.	Student	Formative Evaluation	Number of homework completion; Answering questions on platform; Download the effective number of Teaching resources	
		Teacher	Formative Evaluation	Richness of teaching resources; Effective interaction; Acceptability of course design	

2.1.1. A trinity evaluation of “student + formative + online and offline learning”

As the table shows, Wei Chengjun and Shang Yan et al. (2019) based on literature research, design a hybrid curriculum evaluation centered on students learning situation, including students online time, discussion, homework, student attendance, the group learning, theory test and final inspection, etc.^[38] Yang Xue and Wang Peng(2020) based on the literature research, discusses the undergraduate mixed teaching mode, and points out that teaching evaluation should combine with formative evaluation and summative evaluation. The formative evaluation includes the completion of online and offline homework, the number of clicks on online teaching resources, the online tests, student (or group or

^[38] Wei, C. J., & Shang, Y. Construction of Teaching Evaluation System of Ship Construction Mixed Course [J]. Journal of Liaoning Higher Vocational College, 2019, 21(11): 50-52.

teacher) evaluation, etc; the summative evaluation includes the final examination.^[39] Zhang Chong and Wu Guanhao (2020) take the photoelectric instrument course of Tsinghua University as a case to explore the teaching evaluation design of hybrid teaching. It is pointed out that online evaluation mainly includes online tests and examinations and that offline evaluation mainly includes questionnaires and interviews.^[40] Deng Juan and Zhou Bing et al. (2021) take the basic computer courses of university as an example to explore the evaluation system of students. They point out that the process evaluation includes online and offline learning, and the online learning includes the completion of videos, material reading, chapter tests, learning times, etc.; and the offline learning includes offline check-in, classroom learning performance, classroom interaction and experiment completion, etc.^[41]

2.1.2. A trinity evaluation of “teachers and student evaluation + formative evaluation + online and offline learning”

Lv Weiyang and Song Yunna (2020) based on literature research, points out that students offline evaluation includes written homework, individual performance, group or final homework, and teachers online evaluation includes teaching state, teaching interaction, teaching content and methods, knowledge explanation, etc.^[42] Peng Caiwang and Sun Chaoran et al. (2020) take engine principle course as an example to design hybrid course teaching from teaching content, teaching environment, teaching resources and teaching evaluation. Teachers and students are the main bodies, who are designed the evaluation corresponding dimensions, for example, students' teaching evaluation dimensions include number of job completion times, answering questions such as platform, download the effective number of teaching resources; teachers' teaching evaluation dimensions included teaching resources, teaching effective interaction universality, curriculum design.^[43]

2.2. A review of curriculum evaluation design research

Based on the above research status, it can be found that the construction of most curriculum evaluation design standards is relatively incomprehensive, which mainly reflect in the evaluation subjects, evaluation methods and evaluation contents: 1) for evaluation subjects, most literatures design online and offline learning evaluation dimensions from the perspective of students, while few from the perspective of teachers and students; 2) for evaluation methods, most literatures design evaluation dimension from process evaluation methods, but few from diversified evaluation standards; 3)for evaluation content, most literatures set the evaluation dimension of students' learning or teachers' teaching based on online and offline learning space, and few from the perspective of course stage from pre-class to after-class.

^[39] Yang, X., & Wang, P. *Research on Blended Teaching Mode of Applied Undergraduate from the Perspective of “Golden Class”*[J]. Journal of Jiangsu Vocational and Technical College of Architecture,2020,20(03):79-82.

^[40] Zhang, C., & Wu, G.H. *Research on Hybrid Teaching Design and Practice of Engineering Specialty -- Taking “Photoelectric Instrument Design” Course in Tsinghua University as an Example* [J]. Electronic Education Research,2020,41(05):104-111.

^[41] Deng, J., & Zhou, B. et al. *Optimization and Evaluation Application of Hybrid Teaching Process of Online and Offline Courses: A case study of basic Computer courses in university*[J]. Computer Knowledge and Technology, 201,17(22):175-177.

^[42] Lv, W. Y., & Song, Y. N. et al. *Research on the Realization of Teaching Evaluation of “Blended Teaching + Medical Education”*[J]. Chinese Traditional Medicine Modern Distance Education,2020,18(06):17-19.

^[43] Peng, C. W., & Sun, C. R., et al. *Research on the Design and Application of Hybrid Teaching Mode Based on Network Teaching Platform*[J]. Higher Agricultural Education,2020(01):74-79.

3. Research on the Index Design of Hybrid Teaching Evaluation

The other current topics of hybrid teaching quality evaluation in colleges and universities focus on teaching index design. This part will analyze the current research literature status and discuss the characteristics and shortcomings of it.

3.1. The status quo of research on the index design of hybrid teaching evaluation

At present, some achievements have been made in the construction of hybrid teaching indicators in colleges and universities, and most of the literatures set indicators and weights based on literatures or algorithms (see Table 2).

Table 2. Blended Teaching Evaluation Index Design of Part of Literature

Year	Author	Subject of Evaluation	Methods of Evaluation	Evaluation Content	
				Online assessment	Offline assessment
2020	Guo Jiandong	Student	Formative Evaluation	Unit tests (15%) Unit work (10%) Final exam (10%) Forum replies (5%)	Teamwork performance (5%) In-class test (10%) Simulation projects (15%) Final comprehensive project (30%)
2020	Yue Hua, Wang Xinran	Student	Formative Evaluation	Platform login times (0.095) Times of video view (0.095) Pre-class test (0.095) Online discussion (0.095)	Number of classroom interactions (0.75) Quality of answering questions (0.75) Quality of after-class Works (0.66) Submission of homework (0.33) Summary report of students (0.75) Final examination score (0.25)
2021	Yang Zhongji, Xu Anfeng	Student	Formative Evaluation	Group work (50%) Online interaction (25%) Online learning time (25%) Online Test (25%)	Offline interactions (25%) Final exam (75%)
2020	Han Jihong, Jian Lijun	Teacher	Formative Evaluation	Course structure Teacher guidance strength Learner behavior Educational technology support Student learning effect	
2020	Tan Xiuge	Student & Teacher	Basic Evaluation	Teaching resources (30%) Resource development (30%) Platform construction (20%) Multimedia environment (20%)	
			Formative Evaluation	Study before class (40%) Classroom learning (30%) Review after class (30%)	
			Summative Evaluation	Final assessment (30%)	

3.1.1. A trinity evaluation of “student + formative + online and offline learning”

Guo Jiandong (2020) based on literature research, constructs hybrid curriculum quality evaluation index centered on students’ learning evaluation in the professional curriculum, in which the evaluation index includes 40% online of unit test, homework, the final test and forum reply, and 60% offline of group writing, in-class test, simulation project and final project.^[44] Wang Sheng(2021) based on literature research, constructs hybrid teaching indicators with student evaluation, which are divided into 80% formative assessment and 20% summative assessment. Formative assessment includes 30% online learning before class, 50% offline learning in class and 20% online learning after class, and summative assessment includes 20%, mainly in the final exam.^[45]

In addition to literature collection and comprehensive construction of indicators, some studies also build hybrid teaching indicators and weights based on algorithms. For example, Yue Hua and Wang Xinran et al. (2020) constructed 4 first-level indicators and 10 second-level indicators and their weights based on analytic hierarchy process. The first-level indicators include preview evaluation, teaching evaluation, practice evaluation and final summary evaluation; the second-level indicators include login times, video viewing times, online discussion, classroom interaction, homework, final assessment, etc.^[46]Yang Zhongji and Xu Anfeng (2021) construct hybrid teaching indicators based on multi-source heterogeneous data, including 50% group work, 25% online interaction, 25% offline interaction, 25% offline learning duration, 25% online test score and 75% final exam score.^[47]

3.1.2. A trinity evaluation of “teacher + formative + online and offline learning”

Based on literature research, Han Jihong and Jiang Lijun et al. (2020) designs hybrid teaching evaluation indicators about teachers, including teaching objectives, teaching process and teaching results. The teaching process has four evaluation dimensions with course structure, teacher guidance, learner status and educational technology support; teaching results are based on teaching outputs, such as teachers’ teaching satisfaction, students’ academic ability and interest in learning. Yang Yang and Sun Xin et al. (2020), based on Delphi expert consultation method and analytic hierarchy Process, set up an indicator system and weight distribution of student evaluation in hybrid teaching, including 8 first-level indicators and 22 second-level indicators.^[48]

3.1.3. A trinity evaluation of “teacher and student + formative + online and offline learning”

Xiong Zhijian and Dong Qianyu (2020), based on literature research, constructs an evaluation index system from online and offline learning spaces, including teacher work quality evaluation, student learning quality evaluation and platform-supported quality evaluation. The evaluation of teachers’ work quality includes 14 specific indicators, such as teaching design, teaching resources provision, homework arrangement and teaching adjustment, etc; students’ learning therapy includes 18 specific indicators, such as autonomous learning, homework completion and interactive learning, etc.; platform quality evaluation includes four dimensions of hardware support, software support,

^[44] Guo, J. D. *Research on the Construction and Application of Hybrid Teaching Evaluation Index System*[J]. *Adult Education*,2020,40(12):19-25.

^[45] Wang S. *Construction and Application of Online and Offline Hybrid Teaching Quality Evaluation System*[J]. *Journal of Liaoning Higher Vocational College*, 201,23(06):33-37.

^[46] An X. M. *Research on mixed teaching Scoring model and index system based on AHP*[J]. *Intelligent Computers and Applications*,2020,10(12):220-223+225.

^[47] Yang, Z. J., & Xu, A. F. *Research on hybrid teaching Effect Evaluation System based on Multi-source heterogeneous Data*[J]. *Heilongjiang Education (Theory and Practice)*,2021(08):61-62.

^[48] Yang, Y., Sun, X., & Chen, L. *Research on the Construction of teaching Evaluation Index System of Hybrid Course Teaching*[J]. *Journal of science and technology entrepreneurship*,2020,33(11):146-149.

Table 3. Index Design of Teacher, Student and Teaching Platform

Subject of evaluation	First-level index	Second-level index	
		online index	offline index
Teacher	Pre-class	Integration of video or materials; Readability of material; Proficiency in platform operation	Clarity of teaching objectives; Reasonable teaching design; Richness of teaching resources; Adequacy of teaching materials
	In-class	Update frequency of videos/materials; Teaching interaction frequency Numbers of answering students' question	1) Teaching appearance; 2) Clearance of key and difficult knowledge points; 3) Feedback after class and duration of explanation; 4) Frequency of guiding teaching interaction 5) Appropriateness of teaching schedule
	After-class	Feedback to students on online tests or Q&A Grade to students' online homework in time Number of timely updates to the teaching content	Feedback and readjustment of teaching content/curriculum; Timely feedback on students' final assignments
Student	Pre-class	1. Times of platform login and video viewing 2. The number of clicks and downloads of materials 3. The number of online discussions (posts) 4. Pre-class tests 5. (4) Communication between teachers and students before teaching	Self-supplement of teaching materials, self-study notes, etc
	In-class	1. Number of online unit learning; 2. The number of tests and operations in Chapter; 3. Reading of the material; 4. The number of discussions; 5. The number of valid forums reply speeches	1) Attendance assessment and notes of teaching content; 2) Participation in teaching interaction (group/individual/teachers and students); 3) The number of classes discussions and the quality of questions answered; 4) Test scores; 5) Self-evaluation, group evaluation and teacher teaching evaluation
	After-class	Final Assessment; Group work; Personal evaluation; Student comprehensive homework evaluation	Written work Final exam scores Student comprehensive homework evaluation
Teaching platform		1. Platform operability 2. Real-time monitoring and degree of feedback 3. Confidentiality of teaching resources 4. Easy communication between teachers and students 5. Student learning information timely feedback	

As shown in the figure, the objects are evaluated by their learning or teaching situations in different learning spaces. Take the evaluation objects of teacher as example. In the pre-class stage, teachers

design offline teaching resources and publish online teaching resources. Therefore, the evaluation of teacher online teaching based on their behaviors of pre-class stage, can be divided the definition of teaching objectives, rationality of teaching design, richness of teaching resources and adequacy of teaching materials; and offline teaching can be divided into the integrity of course micro-video, the number of teaching content supplement or update, the frequency of teaching interaction and the number of answering students' questions.

4. Conclusion

Although the researches on blended teaching quality evaluation starts late in China, it has made progress since the post-pandemic, mainly focusing on the curriculum evaluation design and evaluation index construction. Based on the disadvantages analysis of two themes, the paper constructs the evaluation model and evaluation index of hybrid teaching quality, revolving around three evaluation subjects of students, teachers and learning platform, following the combination of formative assessment and summative evaluation and of class stage and online and offline space, in order to offer some references for the later research.

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Internal Logic of the Digitalization of Higher Education Assurance

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Abstract

The COVID-19 has seriously affected human work and life, and higher education is facing unknown challenges now. New means and measures of higher education assurance under the pandemic situation should be applied and also can better show the role played by higher education quality assurance organizations or departments in the Asia Pacific region. It is urgent to use information technology and form such an information-based thinking. Digitization is an important stage in all development stages of informatization, The digital level of higher education quality assurance under the pandemic situation can reflect overall trend of internal factors of higher education in a college, a region, or even a city. Only by mastering the trend can we make accurate and logical decisions to deal with the increasingly rapidly changing problems of higher education quality assurance.

Key words: digitization, internal factors, trends of Higher Education

1. Core concept of the digitalization in Higher Education Assurance

At the broadest level, digitization means the transformation of an organization's core business by using technology and data. The goal of education is students (1). The goal of higher education is to make college students. Under this trend, to the higher education guarantee organizations and related quality assurance departments of colleges and universities, how to use technology and data to affect students' learning results has become a major topic.

Digitization is actually a stage of informatization, so big data is not only an important stage of informatization development, but also an underlying foundation.

The education informatization 2.0 action plan (2) issued by the Ministry of education in 2018 imitates the phased characteristics of education informatization in the digital age. It is planned to realize the requirements of teaching application covering all campuses, improving the informatization application level and improving the informatization literacy of teachers and students by 2022. It can be seen that the connotation of higher education informatization in the national strategy, it is not only the concrete concept of campus information system, but also the internalized information thinking of teachers and students and higher education guarantee organizations. Higher education has its complex and diversified internal laws. Each factor will deeply affect each other. The law is particularly important. Grasping the law is the premise of making correct and rational decisions, Digital thinking is a practical and effective way to grasp the law.

2. The role of digitization in Higher Education

Taking a university in Shanghai as an example, the university has launched the concept of "undergraduate think tank" from 1999. For over than 20 years, it has accumulated key data, including undergraduate employment destination, college entrance examination scores over the years, professional qualification evaluation scores over the years, and visually presented these data and information by using algorithms, This digital application has a far-reaching impact on the

development and reform of the school in the next few decades, especially in the major school affairs decisions of the leadership, such a kind of digitization is a base to the decision made by the university.

3. Application practices of digitalization higher education in Shanghai

Under the impact of the pandemic, the traditional teaching mode has been very difficult to adapt to the challenges of COVID-19. Among them, the learning mode and achievement output mode of postgraduates are different from those of undergraduates. The master's thesis is a more intuitive and visible display of learning achievements in the learning process of two and a half years or more. Therefore, the digital analysis of the quality evaluation results of master's thesis.

Shanghai Education Evaluation Institute has also launched the project of sampling inspection of master's thesis from 2014, which aims to consolidate the graduation quality of postgraduates and publish the sampling inspection results and unqualified list of Postgraduates every year. The intention is to force the university to become the starting point and foothold of higher education quality assurance and form the bottom line thinking of self-protection. In addition, in order to form a linkage mechanism for the master's and doctor's thesis, if the doctoral supervisor has problems in the paper sampling inspection of the previous year, all the master's students will be sampled in the master's thesis sampling inspection of the next year. According to the data analysis of sampling inspection in recent 7 years, according to the analysis of degree points, there are 26 academic degree points and 19 professional degree points among the unqualified results of selected papers for 7 consecutive years. According to the analysis of paper awarding units, there are 5 institutions with unqualified papers for 7 consecutive years. According to the analysis of disqualification rate, the disqualification rate of most degree awarding units has decreased for 7 consecutive years (including since 2020), and the quality of papers in individual colleges and universities is unstable.

Therefore, the application of digital thinking and information system is changing the ways and measures of Shanghai higher education security, and the subject and object of Shanghai higher education security are gradually deepening the thinking of "informatization".

4. Difficulties and suggestions of digitization of higher education quality assurance

4.1 The digital level of professional evaluation cabinet needs to be improved

Universities are not created out of thin air, especially for the needs of profound social background and reality (industry, region, economic development trend, etc.). Today, with more and more attention paid to the ranking of various universities, higher education quality guarantors and university leaders need a way to understand their own strengths and weaknesses, develop their strengths and avoid their weaknesses, and constantly revise the school running objectives and development path of colleges and universities. As students and parents, we also need a way to understand the characteristics of the school in order to plan the future development of students. As a society, we need a way to understand the quality and ability range of graduates.

As a third-party intermediary organization, it has mastered a large number of data and written descriptions. How to provide information with decision-making value for the subject and object of educational security is the foundation of the next few decades.

At present, China's higher education evaluation refers to the lack of professional evaluation talents by the third-party intermediary organizations different from colleges and universities and the government. At present, although 78 colleges and universities have set up higher education majors, 67 of them are doctoral programs, and the direction of education evaluation accounts for only a small part of the training direction. (Graduate professional directory, research and recruitment network) there are few professional evaluation talents with information processing ability.

In 2009, ARWU became an independent legal person independent of Shanghai Jiaotong University. Its research team came from Jiaotong University. With the help of data processing ability and broader revenue sources, ARWU became one of the four largest universities in the world in just a decade. The guarantee of professional talents is an obvious and important reason.

This situation has a gap with the requirements of higher education security for digitization.

4.2 Difficulties in data acquisition

The concept of higher education quality is broad. Taking undergraduates as an example, many parents take finding a good job as the index, and colleges and universities take the employment rate and employment starting salary as the index. Education quality assurance institutions need to explore and analyze the law of Higher Education under a certain index for different customers, draw conclusions, or form effective measures and methods.

Data collection is particularly important, which is also the basis of digitization. Without data, there is no law.

Statistics show that the creation of large nonrandom samples is not better than small random samples. At present, the data collection points of higher education security are diverse, and even the data collected by the same index with different caliber are different.

Therefore, scientific and reasonable sample distribution is more feasible than large-scale samples. (3)

Accordingly, there rises another problem. The display of trends and laws takes a period of time. If the long-term changes cannot be observed, the data source of education quality assurance cannot be guaranteed.

4.3 Cultivation of digital thinking

The purpose of higher education quality assurance is not only to "build a fence", but also to promote and improve. Now, the of digital thinking is more and more reflected in "copying successful events to become probability events"(4) . The digital presentation and modular analysis of a single successful event is the premise of copying this behavior.

Taking Shanghai University, A as an example, according to the traditional measurement standard, the average score of the paper sampling of a master of engineering graduates in the university is not as good as that of the same major of University B for several consecutive years, but it is slightly better than that of University B in terms of employment rate and starting salary. Can the practice of University B be copied and used for reference?

The answer may be far from that simple.

Firstly, due to the background and development history of different universities, the focus and advantage direction of the same major are very different, and the reviewers are often the concepts of big peers and have their own familiar directions and fields. Therefore, the evaluation criteria will naturally deviate.

Secondly, the source of students in universities is also different. Local students naturally show advantages over foreign students in employment.

Finally, paper sampling is a phased assessment of graduates' knowledge mastery depth and application ability. As a knowledge system in a certain field, it is becoming more and more cross and integrated. It is difficult to judge the overall professional ability and quality of a graduate. On the contrary, does college a, whose graduates' knowledge mastery depth and application ability are insufficient, have its own characteristics in the corresponding industry and graduates' professional ability.

The factors involved in the real quality assurance of higher education are broader. Whether it is teaching quality, employment, graduation design and other major links, or as small as the participation of classroom homework in a class, we need to establish digital thinking. Otherwise, we will be more and more unable before more and more huge data.

The development of digitization is not only the upgrading of information processing technology and system, but also the popularization of people's digital thinking.

Take the American CBAL project as an example. CBAL is the acronym of cognitive based learning assessment. The essence of the project is to create learning scenes and adopt task-based learning mode. The purpose of the research is to record the achievements in the learning process and promote the formulation and adjustment of teaching plans (review of American CBAL evaluation system and Shanghai Education Evaluation Research). Its core architecture collects data from four parts: learning content, evidence list, learning ability model and progress, and establishes connections, which is the display of large digital thinking for a specific research content.

Admittedly, not all digital processing needs to be completed by such a professional institution. In 2018, a university conducted an analysis on the degree of Employment Anxiety of graduates in Shanghai, using SPSS 25.0 version. The dependent variables adopted four kinds of "very low", "low", "high" and "very high". The spacing between each variable is the same. The regression analysis results show that, From the perspective of self-factor analysis, knowledge reserve, lack of ability and school counseling. It has a positive impact on Employment anxiety, and the influence degree of the above three items is not different, while the reputation of the school has a negative impact on anxiety.

5. Summary

To analyze the topics involved in the quality assurance of higher education, data acquisition and digital presentation of phenomena are the premise. There are many data acquisition points and many modular analyses are required. If you want to copy a single successful event, it is very important to analyze the mathematical logic behind the phenomenon, Therefore, the cultivation of digital thinking is the starting point and foothold of digitization. Finally, higher education quality assurance

practitioners should develop a normal digital thinking mode and return the phenomenon to the essential reason through digital presentation. In the light of the above findings, normalization of data monitoring, cultivation of digital thinking will never be late to be thought first before we talk about the digitalization of the higher education assurance.

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World-Class Universities Evaluation: History and Characteristics

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Abstract

World-class universities evaluation is a hot topic in the era of higher education internationalization. Chinese Academy of Science and Education Evaluation (CASEE) has done the world-class universities evaluation since 2006 which based on the history of Research Center for Chinese Science Evaluation (RCCSE). CASEE's world-class universities evaluation employs a unique index from the perspective of scientometrics from the very beginning. The index system has been adjusted according to the development of higher education.

Keywords: world-class universities, higher education evaluation, Chinese Academy of Science and Education Evaluation, evaluation index

1. Introduction

University evaluation has a profound history, it can be traced from the early beginning of higher education activity in the Middle Ages. As university ranking provides a visual landscape of universities all around the world, university ranking is regarded as a main approach of university evaluation especially in the times of popularization of higher education. Universities evaluation, especially ranking have become the catch phrases for the stakeholders of higher education since the 21st century.

Nowadays, governments have introduced various world-class universities initiatives in order to enhance the competitiveness of universities in countries such as Germany, Demark, Russia, South Korea, Spain, Egypt and so on. The world-class university movement is reshaping the landscape of the world higher education. Likewise, China came into force world-class universities and disciplines' building initiative (Double First-Class initiative) in 2015. To know which universities are world-class universities and how to build world-class universities is the calling of stakeholders of universities.

The elite status of world-class universities relies on international recognition. As the main way of higher education academic performance evaluation, the continued importance of university rankings has served to fuel the growth of the world-class university movement. The ranks of The Times Higher Education (THEs), US News & World Report (USNWR), Quacquarelli Symonds World University Ranking (QS), Academic Ranking of World Universities (ARWU) have done the world universities rankings by employing different index systems. In view of the significance of universities evaluation, the Chinese Academy of Science and Education Evaluation (CASEE) has conducted global universities ranking since 2007, with the aim of providing a comprehensive panorama and details of

the high-quality universities. This paper focuses on the history of CASEE’s world-class universities ranking, and tends to analyze the characteristics of the world-class universities’ evaluation.

2.The History of CASEE’s World-class Universities Evaluation

The *GAR World University Ranking*, created by Research Center for Chinese Science Evaluation (RCCSE) in 2006, three years after the launch of GAR Chinese University Ranking, aims to evaluate the scientific research competitiveness of world universities. In 2017, Prof. Qiu Junping, the founder and the primary investigator of GAR and RCCSE moved to Hangzhou Dianzi University and established the CASEE. Since then, the GAR has been co-operated by RCCSE and CASEE since 2017.

With the change of time and the increasing demand of the university evaluation, the methodology of *GAR World University Ranking* has been constantly improved in the past decade. In 2014, the number of major indicators for the evaluation were: scientific research productivity, scientific research impact, scientific research innovation and network influence. The *GAR World University Ranking* expanded to discipline ranking and renamed as *GAR World Class University and Discipline Evaluation Report* in 2016. These changes could divide the history of *GAR World University Ranking* into four periods as below.

2.1 Evaluation of the world-class universities (2006-2013)

From 2006 to 2013, the evaluation index of world-class universities consisted of four indicators with two levels as shown in Table 1. They are scientific research productivity, scientific research impact, scientific research innovation and scientific research development ability.

Table 1, Evaluation index of world-class universities (2006-2013)

Primary indicators	Secondary indicators
Scientific Research Productivity	Number of papers
Scientific Research Impact	Number of citations
	Number of highly cited paper
	Number of disciplines in ESI
Scientific Research Innovation	Number of patents
	Number of hot papers
Scientific Research Development Ability	Percentage of highly cited paper

1. Scientific Research Productivity

It is measured by the number of ESI papers published in the past 11 years, which represents the contribution of the institution or discipline to the scholarly literature.

2. Scientific Research Impact

It is measured by three indicators: total number of citations received in the past 11 years, the number of highly cited paper and the number of disciplines included in ESI. The total number of citations and the number of highly cited paper represent the quality of research while the number of disciplines included in ESI represents the impact of the institution on academia.

3. Scientific Research Innovation

It is measured by two indicators as the number of hot papers and patents. The emergence of hot papers inevitably shows that this paper meets the requirements of disciplinary and social development; and the patent itself represents novelty, which transforms the advancement of knowledge into social productivity.

4. Scientific Research Development Ability

It is measured by the percentage of highly cited papers, which is calculated by the ratio of highly cited paper to all paper published. The higher percentage means the efficiency of research excellence; an institution with higher percentage of highly cited papers is likely to produce more in the future research and maintain its core status of the discipline for a long time.

2.2 Evaluation of the world-class universities (2014-2015)

With the development of Internet and web technology, the network impact, replacing the scientific research development ability, has been included in the evaluation of world-class universities since 2014. As table 2 shows, the new criteria for evaluation have been updated as: scientific research productivity, scientific research impact, scientific research innovation and network influence.

Table 2. Evaluation index of world-class universities (2014-2015)

Primary indicators	Secondary indicators
Scientific Research Productivity	Number of papers
Scientific research influence	Number of citations
	Number of highly cited paper
	Number of ESI discipline
Scientific Research Innovation	Number of patents
	Number of hot paper
Network Influence	Online university Ranking of other countries

It is worth to mention that the network influence is measured based on the web ranking which represents the extent to one certain university's publications published on the web publicly. The data are retrieved from the "World University Network Metrology ranking" released by Cybermetrics Lab of Humanidades y Ciencias Sociales Centro de Ciencias Humanasy Sociales of Spain and the "China Key University Network Impact ranking" released by the RCCSE.

2.3. of the world-class universities (2016-2018)

The *GAR World University Evaluation* has expanded to discipline ranking and renamed as *GAR World Class University and Discipline Evaluation Report* since 2016. The evaluation index moved from scientific research only to the comprehensive evaluation consisting of four criteria as shown in Table 3, which are teacher strength, teaching level, scientific research ability, reputation influence.

Table 3. Evaluation index of world-class universities (2016-2018)

Primary indicators	Secondary indicators
Teacher Strength	Number of faculty
	Number of highly cited scientists
Teaching Level	Number of outstanding alumni
	Number of ESI discipline
Scientific Research Ability	Number of papers
	Number of citations for each paper
	Number of international co-authored papers
	Number of invention patents
Reputation Influence	Web influence
	Number of highly cited papers

1. Teacher's strength

Teacher's strength represents the talent pool of top universities, and is an important indicator to measure top universities. Full-time teachers are the backbone of top universities, which is of great significance to top universities. Highly cited scientists are the highest manifestation of teacher strength and a symbol of high-quality talent.

2. Teaching level

The teaching level is reflected by the number of outstanding alumni and the number of disciplines included in the ESI rankings. The number of outstanding alumni is also one of the most important indicators of teaching quality representing the depth of teaching level, while the number of disciplines included in the ESI rankings is measured as the breadth of the teaching level.

3. Scientific research ability

It is measured by for minor indicators: the number of ESI papers, the citation rate of these ESI papers, the number of international co-authored papers and the number of invention patents in the past 11 years. The number of ESI papers published in the past 11 years reflects the contribution of the institution or discipline to the literature. Although the total number of citations could reflect the quality of research, the citation rate can represent the overall quality of each paper. The number of international co-authored papers can effectively reflect the degree of international collaboration. Patent is another important indicator of scientific and technological progress, which transforms the advancement of knowledge into social productivity

4. Reputation influence

It is measured by both the web ranking and the number of highly cited papers. The web ranking represents the extent to which university publications published on the web publicly. The higher web ranking indicates the higher impact of the institution online. In addition, the number of highly cited papers is one of the main indicators representing the reputational influence.

2.4 Evaluation of the world-class universities of 2019

The *GAR World Class University and Discipline Evaluation* has adjusted several ranking criteria, which can be seen in table 4, they are teacher strength, teaching level, scientific research ability, reputation influence respectively.

Table 4. Evaluation index of world-class universities of 2019

Primary indicators	Secondary indicators
Teacher Strength	Number of faculty
	Number of highly cited scientists
Teaching Level	Number of outstanding alumni
	Number of international co-authored papers
Scientific Research Ability	Number of ESI paper
	Number of citations for each paper
	Number of highly cited papers
	Number of Derwent patents
Reputation Influence	World University Network Metrology
	Number of ESI disciplines

1. Teacher strength

Teacher's strength represents the talent pool of top universities, and is an important indicator to measure top universities. Full-time teachers are the backbone of top universities, which is of great significance to top universities. Highly cited scientists are the highest manifestation of teacher strength and a symbol of high-quality talent.

2. Teaching level

The teaching level is reflected by the number of outstanding alumni and the number of disciplines included in the ESI rankings. The number of outstanding alumni is also one of the most important indicators of teaching quality representing the depth of teaching level, while the number of international co-authored papers can effectively reflect the degree of international collaboration.

3. Scientific research ability

It is measured by for minor indicators: the number of ESI paper, the number of citations for each paper, the number of highly cited papers, the number of Derwent patents. The number of ESI papers published in the past 11 years reflects the contribution of the institution or discipline to the literature. Although the total number of citations could reflect the quality of research, the citation rate can represent the overall quality of each paper. Patent is another important indicator of scientific and technological progress, which transforms the advancement of knowledge into social productivity. In addition, the number of highly cited papers is one of the main indicators representing the research ability.

4. Reputation influence

It is measured by both the world University Network Metrology ranking and the number of ESI disciplines. The world University Network Metrology ranking represents the extent to which university publications are publicly published on the web. The number of ESI disciplines indicates the higher impact of the institution.

Employing the new evaluation index, the RCCSE and the CASEE launched 148 rankings in 6 categories in 2020. The rankings include the *World National Scientific Research Competitiveness*

Rankings (2020), World-class University Comprehensive Competitiveness Rankings (2020), World-class University Rankings by Discipline (2020) (22 disciplines), World-class University Essential Indicator Rankings (2020) (4 indicators), World-class University Basic Indicators Rankings (2020) (10 indicators), World-Class Discipline Rankings (2020) (In 108 Disciplines), World-class University Rankings by Continents (2020) and so on. The GAR World University Ranking uses the ESI, the most authoritative and advanced indicator, as the accurate and reliable data source. It provides the most detailed evaluation report of world universities, not only at the country and institution level, but also at the level of discipline.

3.The Characteristics of CASEE’s World-class Universities Evaluation

3.1 The principles of the evaluation

Given the considerable differences of the universities ranking’s ideas and goals, it is important to know the principles of a certain universities ranking. The evaluation principles of GAR ranking are weighting the teaching, research, social service and contribution as the basic standard. The leading idea of the CASEE is putting the universities’ teaching, research and social service performance and social contribution as the basic standard. The ranking makes every effort to guarantee to get the “scientific, reasonable, objective, justice” ranking results. Based on years of ranking experience and the above ideas, eight principles came into being gradually, we adhere to those eight principles firmly in our evaluation.

- 1) The ranking is a combination of management-oriented and market-oriented.
- 2) Combine the qualitative and quantitative evaluation;
- 3) Balance the relationship among input, outcome and efficiency properly;
- 4) Give the equal weight between natural science and social science;
- 5) Dealing with the relationship between scale and efficiency properly, laying particular stress on efficiency appropriately;
- 6) Give more weight on quality than quantity;
- 7) Balance the relationship between teaching and research although give a little more weight on research as evaluating top universities.

Besides, balancing the weight of Chinese data and international data properly but giving more weight on international data. The CASEE adheres to those eight principles strictly so as to provide scientific and objective reference to universities stakeholders.

3.2. Object and scope of the evaluation

There is at least one discipline included in ESI for Chinese universities and two disciplines for non-Chinese universities in the list of World-class Universities. 1534 out of 6009 universities meet the requirements of this evaluation and enter the list of World-class Universities. In addition, we thoroughly disambiguated the university names and merged the different names of the same university such as UNIV MIAMI and MIAMI UNIV, UNIV TAMPERE and TAMPERE UNIV, VITA-SALUTE SAN RAFFAELE UNIV, UNIV VITA SALUTE SAN RAFFAELE and VITA SALUTE SAN RAFFAELE UNIV, and so on.

3.3. Data collection

The data of Publication were collected from the ESI database every year. The patent data were retrieved from the US DII covering a certain period in one year. The network ranking data were

collected between from the World University Network Metrology ranking, which was released by Cybermetrics Lab in Spain.

In order to justify our methodology, we would like to provide the definitions of such indicators as follows:

- 1) Highly cited paper: in a given discipline, the number of citations received was ranked within the top 1% by ESI.
- 2) Highly cited scientist: The global list of highly cited scientists published by Clarivate as the highly cited researchers
- 3) Number of international collaboration papers: Number of papers co-authored by scholars who come from more than two countries.
- 4) Number of outstanding alumni: Number of Nobel Prizes and Fields Awards laureate, as well as the 100 most influential people in the world annually selected by Time magazine in the past 10 years.
- 5) ESI discipline: 22 disciplines classified by ESI as agricultural science, biology and biochemistry, chemistry, clinical medicine, computer science, economics and business, engineering, environmental science and ecology, earth sciences, immunology, materials science, mathematics, microbiology, molecular biology and genetics, comprehensive interdisciplinary, neuroscience and behavioral Sciences, pharmacology and toxicology, physics, botany and zoology, psychiatry and behavioral sciences, social sciences, and space science.

3.4. Definition of world-class universities

It is necessary to clarify the definition of the world-class universities and disciplines before the ranking. We define the top 1200 universities in the ranking as the world top universities out of 1,534 universities. We divide the world-class universities into three levels: The top 1% universities are the world's elite universities assigned five stars (5★+) in the ranking; ranked 1%-5% universities are the world's elite universities assigned five stars (5★) in the ranking, ranked 5%-10% universities are world's core universities assigned four stars (5★-) in the ranking; ranked 10%-20% universities are world's core universities assigned four stars (4★) in the ranking; ranked 20%-50% universities are world's top universities assigned three stars (3★) in the ranking. Both the elite universities and core universities are defined as the world-class universities in our ranking.

4. Conclusion

The CASEE's universities evaluation has 14 years history from the beginning of 2006. The CASEE's world-class universities evaluation insists its own principles, and forms its own characteristic based on the evaluation history. Evaluation index is the core part of a set of world-class universities evaluation. In accordance with the idea of based in China with global visions, the evaluation adjusts its' evaluation index based on the context of the continual development of higher education. Which from the perspective of focusing on scientometrics to paying more attention to the mission of higher education? The evaluation will help universities' stakeholders have an overall understanding of the world universities' developing status and trends. More importantly, the evaluation will help the universities fully realize their status in a broad context, thus to know the gap between the individual university and the world-class universities in the changeable world.

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