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Navigating Educational Transformation: The Role of University Teachers in Post-Pandemic–A Case Study of Egyptian Higher Education

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Abstract

In the consequences of a crisis such as a pandemic, educational systems often undergo phases of crisis management, which may inadvertently result in a return to pre-disaster educational practices. This study explains the current landscape of the role of academic teachers in Higher Education (HE) institutions, within the context of Egyptian Higher Education, aiming to

establish benchmarks for retaining the gains made during the pandemic and directing planned increases in allocated resources towards enhancing online learning environments. Employing an explanatory mixed-methods approach, this study conducted surveys with 51 university academics followed by interviews with 7 educators in Egyptian HE institutions. Findings revealed significant transformations in teacher roles and instructional methodologies post-pandemic and positive gains, particularly with the prominence of hybrid learning as a mode of instruction. However, gaps persist in understanding the blended ratio and fostering student collaboration. Key findings include: (1) Flexibility and adaptability among educators in integrating innovative approaches. (2) Enhanced leadership skills among educators during the pandemic, emphasizing the significance of continuous professional development and personalized learning plans. (3) Addressing the digital divide among students emerges as a formidable challenge, necessitating comprehensive strategies to ensure equitable access to technology and learning opportunities. Gaps addressed in the study findings that can lose the attained gains and hinder adaptation to the changes in teachers' roles include collaboration between teachers and between teachers and students, and teachers' Continuing Professional Development (CPD) and Personal Development Plan (PDP). The study concludes by offering recommendations to enhance teachers' knowledge and competencies to effectively navigate these evolving changes in the educational landscape.

Keywords: Higher Education, Hybrid, Perception, Practices, Transform, Teacher

1. Introduction

1.1 Study Background

Egypt is recognized as the most densely populated country in North Africa and the Arab World, boasting a population of about 104 million people. In terms of administrative divisions, Egypt is segmented into seven regions, comprising a total of 27 governorates. Among these, four governorates, namely Cairo, Alexandria, Suez, and Port Said, are designated as urban areas, while the remaining 23 governorates encompass both urban and rural zones. Notably, the majority, accounting for 57% of Egypt's population, resides in rural regions (UNICEF 2023). The Egyptian Higher Education system has 27 public universities, 27 private universities, 20 semi-private universities, 10 technology universities, and 158 special higher education institutes, serving a total of 3.6 million students (El-Sayad, 2021). The spending on Egyptian higher education has seen fluctuations. In the fiscal year 2023/2024, it amounted to approximately $6.3 billion USD, constituting less than 1% of the country's GDP. This figure marked a decrease compared to the previous years, with $5.4 billion USD allocated in the fiscal year 2022/2023 and $4.1 billion USD in 2021/2022. These fluctuations in spending reflect the varying priorities and challenges faced by the Egyptian higher education sector (Ministry of Finance, 2023). World Bank (2022) summarized the situation as; insufficient public spending on education has led to a shortage of teachers and classroom infrastructure, putting public education in Egypt under significant strain. As the scarcity of funding in academic institutions have hindered organizational responsiveness and students' ability to engage in digital learning, due to the inadequate internet coverage and usability, as well as the lack of advanced technologies. Limited CPD to equip teachers with skills and knowledge to use online tools (Zhong, 2020; Kaoud et al., 2021). The previous factors, explain reasons that mode of learning, teaching and assessment before the pandemic, was predominantly dependent on face-to-face learning environments. In the Egyptian educational landscape, the pre-COVID era was characterized by traditional teaching methodologies predominantly conducted in face-to-face settings across educational institutions. Teachers relied heavily on in-person interactions and classroom-based instruction to deliver curriculum content and facilitate student learning. According to Moursy (2023), limited interaction and engagement in online learning is one of its disadvantages for students. For some teachers, the Virtual Learning Environment (VLE) is treated simply to share files online, similar to Google Drive.

With the outbreak of the COVID-19 pandemic, there was a sudden and unprecedented shift towards Emergency Remote Teaching (ERT) as schools and universities were forced to close their physical campuses. According to UNESCO (2020) Higher Education Institutions (HEIs) across the world found themselves in a race to introduce online learning immediately for staff and students. This transition to remote learning presented numerous challenges for educators, students, and administrators, in developing countries the challenges was worse sure to the lack of preparation and understanding of online learning outcomes. Teachers were tasked with quickly adapting their pedagogical approaches to online platforms, facing with technological barriers, and ensuring continued student engagement in virtual classrooms (El-Sayad et al., (2021); Moursy (2023)). Meanwhile, students faced difficulties adjusting to

remote learning environments, including limited access to necessary technology and internet connectivity issues. Consequently, during the Covid-19, using online learning was the most effective and available way to continue learning (Essa, 2023).

As the pandemic persisted, educational institutions began exploring alternative teaching modalities to mitigate the impact of prolonged remote learning. The concept of hybrid teaching emerged as a viable solution, blending both online and in-person instruction to provide flexibility and accommodate diverse learning needs (Essa, 2023). This hybrid approach allowed for a combination of traditional face-to-face interactions and digital learning experiences, aiming to strike a balance between safety concerns and educational continuity. While hybrid teaching has demonstrated its potential to provide flexibility and adaptability in response to crisis situations, ongoing efforts are needed to address issues of equity, accessibility, and quality in hybrid learning environments.

The concerns raised from the above-explained changes, as indicated by Morsi (2023), regardless of whether they are ready for it or not. One thing is for sure: the educational landscape has undergone a permanent transformation in the process of teaching and learning. Another claim confirms that this shift from face-to-face (f2f) to online represents digital transformation (Kaoud et al., 2021), while a third claim confirms that it was Emergency Remote Teaching (ERT) (Jili et al., 2021). From the authors' point of view, the term "regardless" reflects that there are overlooked perspectives, and the disillusionment between DT and ERT needs to be further addressed, with a special focus on the role of teachers in higher education (HE), teaching practices, and their perception of these changes. This is the focus of this study, as it explains how teaching practices and perceptions have changed among educators in response to the COVID-19 pandemic, and what lessons have been learned. In particular, the study's research questions are:

1) What changes have occurred in job roles, teaching tools and strategies as a result of the pandemic?

2) How do educators perceive the change in their role in teaching and learning?

3) What are the takeaway lessons from this lived experience?

1.2 Study Contribution

The study has multi-faceted contribution to knowledge by providing insights into how teaching practices and perceptions have changed among educators in response to the COVID-19 pandemic. (1) For teachers, as they were forced to adapt quickly to new teaching methods and technologies during the pandemic, the study contributes by shedding light on the lessons learned from this adaptation process. It highlights the changes that have occurred in job roles, teaching tools, assessment methods, and instructional strategies as a result of the pandemic, offering valuable insights into the evolving landscape of education. (2) For teaching practices, the study guides the enhancement of digital skills among educators. The widespread adoption of online and remote teaching necessitated the development of digital literacy skills, which are crucial for effective teaching in today's digital age. By identifying the challenges faced by educators in implementing technology in teaching and learning, the

study provides guidance for overcoming barriers and maximizing the benefits of digital tools in education. (3) On a strategic level, by examining how institutional policies and infrastructure have influenced educators' experiences and practices during the pandemic, the study informs strategic decision-making processes aimed at improving educational outcomes and enhancing the overall learning environment.

This paper follows a standard structure: introduction, literature review, methodology, findings, discussion, and conclusion. It introduces the topic, reviews relevant literature, describes the research approach, presents findings, analyses them, and concludes with recommendations for future research.

2. Literature Review

2.1 Teaching Practices: Pre-Covid

Pre-COVID, the majority of e-learning materials utilized were asynchronous (non-real-time) in nature, with synchronous (real-time) learning materials being less common (Essa, 2023). The large class number in Egyptian higher education present a challenge, as the high class densities and overcapacity not only impact structural integrity but also learning outcomes (Farid, 2022). Teaching workload and limited time to cover the curriculum (Richardson et al., 2012), along with a lack of continuous professional development (CPD) opportunities (Ismail, 2017), contribute to the shortage of qualified academic staff and financial challenges in funding higher education (UNESCO, 2020).

According to Ismail (2019), these challenges constrain educators to adopt a teacher-centred approach in their teaching practices, resulting in limited communication between teachers and students as well as among students themselves. Additionally, there is limited time to cover the content. Moreover, based on the Technological Pedagogical Content Knowledge (TPACK) model (Mishara and Koehler, 2006), there is a strong emphasis on content knowledge, moderate technology knowledge, but a clear gap exists in the intersection between pedagogy and technology knowledge, leading to a limited focus on pedagogical approaches using technology. However, as noted by El-Sayad (2021), some faculty members, either individually or collectively, utilize various social networking sites such as WhatsApp, Facebook, and YouTube for easy communication with their students.

2.2 Teaching Practices: Within Pandemic

In response to the global pandemic, in March 2020, the Egyptian Government decided to shut down all schools and universities and have all teaching undertaken virtually. At the end of July–September 2020, the usage of mobile devices reached 94.09% and increased to 95.37% by November 2020 (MCIT, 2020). This dependency on internet networks and digital systems urged the Egyptian government to make crucial decisions regarding the improvement of the ICT infrastructure. According to Jili et al. (2021), who described this stage as Emergency Remote Teaching (ERT) rather than online teaching, evaluating the teaching and learning experience during this stage depends on the HEI and national capacity to deal with certain overbearing factors, such as the technological (ICT) base, political and administrative climate, and cultural, psycho-cultural, socioeconomic, and geographical factors. These factors

interplay at national, institutional, and individual levels. For Moursy (2023), addressing the limited pedagogical and technological skills and knowledge led to the sudden shift to online teaching. Ramírez-Hurtado et al. (2021), in their study in universities in Spain, noted two factors subject to generalization: (1) this transfer process was planned and executed quickly, with urgent redesigns of courses originally conceived for live teaching, and (2) educational institutions had to rapidly adapt and shift course material originally designed for face-to-face training. For the above situation during the pandemic, the overall evaluation was general dissatisfaction for students and teachers, with limited interaction between students or between student/teacher. The situation in Egypt is applicable to the above two points, highlighting the need for rapid adaptation and challenges in course redesign for online delivery amidst limited technological and pedagogical preparedness. From the positive side, according to El-Sayad (2022) and Moursy (2023), there are learned lessons, as this situation has forced higher education institutions to change their focus towards effectively delivering online education and assessing outcomes to their students' satisfaction. In summary, the pandemic provided an opportunity for higher education institutions in Egypt to apply a real simulation, gains need to be maintained.

2.3 Teaching Practices: Post Pandemic

E-learning was introduced as a temporary and urgent solution during the COVID-19 pandemic to restore equity and ensure access to education (UNESCO, 2020; Jili et al., 202). Blitagy (2021) highlights that the pandemic brought about new learning methods, emphasizing the quality of education and flexibility with technology.

Therefore, it has proven to be a success and is likely to remain a part of the education system. However, as highlighted by Morsi (2023), regardless of whether educators are prepared for it or not, one thing is for sure: the educational landscape has undergone a permanent transformation, and the process of teaching and learning will never be the same as it was in the pre-COVID-19 period. Using the term "regardless" by Morsi (2023, rings a bell to the authors, indicating that more work is needed to explore overlooked perspectives and complexities associated with the educational transformation post-COVID-19. There is a pressing need to delve deeper into the implications of this transformation on teaching practices, pedagogical approaches, and the overall educational landscape. Additionally, understanding the challenges and opportunities that arise "regardless" of educators' readiness can inform future research and policy interventions aimed at fostering resilience and adaptability in education systems worldwide.

Essa (2023) highlights the importance of teachers' competency skills and knowledge in maximizing student learning in this complex environment, where critical decisions are required daily (Jackson, 1990). For example, the shift to student-centred learning empowers students' readiness and enhances achievement by enforcing attention and focus during learning. Examples of complexities include technical affordability to support hybrid learning, adequate training for teachers and students, and institutional planning and execution decisions. Essa (2023) further suggests that poor provision of these fundamental elements in hybrid learning would negatively affect learning outcomes. The below section explains the literature

lens about hybrid/blended learning.

2.4 Blended/hybrid Earning

According to Essa (2023), the education system in Egypt introduced the blended education where online and campus-based teaching and learning merge. Blended or hybrid or Hybrid-Flexible (Hy Flex) learning combines different learning modes from face-to-face to distance learning (see Figure 1 below), different learning resources from books to language labs to videos, different learning paces from self-pace to group-pace, and different learning timings from synchronous to asynchronous (Kaoud & Yousri (2021); Bennett et al., 2020).

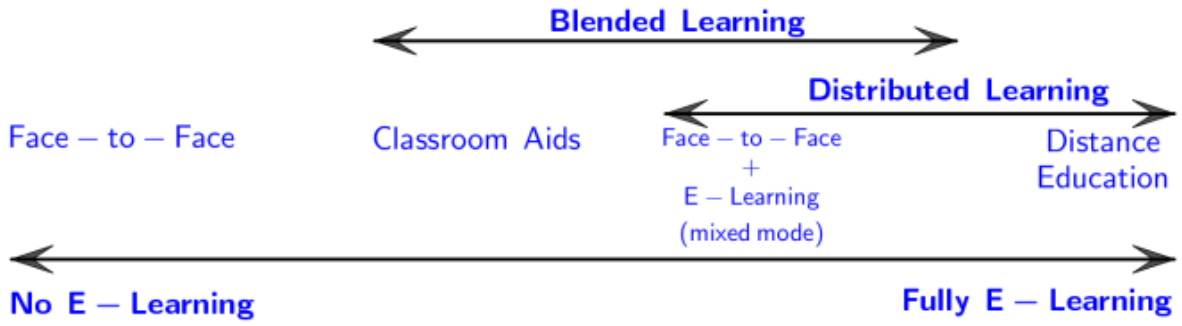

Figure 1. The continuum of technology-based learning by Bates and Poole (2003)

Hybrid learning offers multifaceted benefits. Firstly, it aids in reducing the overcrowding of students on campus, particularly beneficial in instances where cohorts exceed 2000 students (Ismail, 2017). Secondly, it fosters independence among students, encouraging them to become more self-reliant learners (Bennett et al., 2020). From a teaching perspective, hybrid learning facilitates greater integration of technology in education, ensuring educators remain up-to-date with innovative teaching methodologies and tools (Fong et al., 2008; Biltagy, 2021). From social perspective, Thorne (2003) suggests that It achieves intercommunication between teachers and students, and between the students and their peers, thus increasing learning effectiveness. It furthermore makes use of a variety of techniques and technologies, and thus offers a dimension of flexibility in learning. In addition, Fong et al. (2008) stress the importance of human interaction between learners and educators and add this perspective to the definition of blended learning. They explain the importance of using a facilitator and also promote various types of interaction between trainer, trainee and course material (Fong, Kwan, & Wang, 2008). Challenging criteria for blended learning is the ratio of mix between f2f and online teaching. Some studies recommend a fixed ration, such as Banyen et al. (2016) a blending ratio of 60% e-Learning and 40% face-to- face learning is a suitable blended learning. For Fong, Kwan and Wang, 2008, to define a ratio of this blend, there are many elements need to be considered, such as instruction strategy, pace or learning, real or non-real time (see Table 1 below).

Table 1. Elements to inform the blending ratio in hybrid learning

Instructional design	Lab	Teacher-facilitated (explain concepts)	Hands-on practice	Self-study
Delivery mode	Online	F2f	F2f	online
Pace	Individual	Group work	Group work	Individual, then group
Time	Non -Real time	Real time	Real time	Non -Real time
Learning tool	Simulation	Interactive board	video	VLE and forum

For teaching, the pandemic and the introduction of online learning followed by a hybrid environment impacted teaching pedagogy, turning teaching and learning to new ways of thinking about learning. According to Farid (2022), this shift to online education has accelerated the application of new forms of pedagogy and has given birth to a tremendous number of initiatives from individual academics and institutions. However, much of online education remains basic, merely replicating the traditional conditions of learning on-campus. Some institutions were already working on new online or blended delivery approaches, but many others were caught by surprise. Moreover, for some remote areas that have limited technological infrastructure, blended education is planned to continue for 2020-2021 until normal education becomes a possible option (Saeed et al., 2021; Farid, 2022). There has been no time to rethink and develop pedagogy or work with professional instructional designers on enriching teaching material for online delivery, and no time to train lecturers on how to deliver online.

For students, online programmes highlight the need to ensure that online students are well-prepared to learn in this environment, including ethics, how to communicate, technological preparedness (Hüther & Krücken, 2018; Legon & Garrett, 2017). Being unprepared for the shift to online learning, their attitudes towards online learning included aspects such as student motivation, self-discipline, regulation, and time management (Kahoud et al., 2021).

As areas of improvement. in a study for Cairo University, the first and oldest university in Egypt, the shift to online learning has been successful. However, for sustainability, three in-depth need analyses are needed: institutional level (including infrastructure and curriculum), teacher needs (including CPD and preparedness), and student needs (including their capabilities to deal with technology from academic, social, and motivational aspects). As an area of improvement, Saeed et al. (2020) call for quality assurance to build benchmarks to evaluate effectiveness. These calls align with UNESCO's (2020) query that questions how universities plan for the future with rapid global changes and challenges.

From the above, online learning is ongoing, there has been a notable increase in national investment towards online education, with $6.3 billion USD allocated by the Ministry of Finance in 2023. Higher Education Institutions (HEIs) have seen significant benefits in

infrastructure development, particularly in building online platforms. From a professional perspective, there have been observed changes in teaching practices, with educators acquiring new skills and knowledge from this experience. However, it is imperative to organize, review, and explore the previous gains and changes in fund allocation, resources, and capacity building. Crises are often followed by periods of crisis management, indicating the potential for systems to revert back to pre-disaster norms. This serves as a benchmark and review point to capture the current situation, including opportunities and challenges, guiding the efforts and funds allocated to HEIs. HEIs must learn from the lessons of the COVID-19 lockdown to enhance the efficiency of education.

2.5 Understanding Digital Transformation in Higher Education: Practices and Perceptions

From the organisational scope and technology perspective, OECD (2019) defines Digital Transformation (DT) as the result of digitization and digitalization of economies and societies. It is a process involving several digital technologies, from 5G to artificial intelligence, big data and blockchain. In learning, according to Brooks & McCormack (2020), DT is more than integration of digital technology into all aspects of teaching and learning, it is fundamentally changing the way educators deliver instruction and students engage with content, in other words changing how teachers teach. from traditional teaching methods to more interactive, technology-driven approaches that enhance collaboration and innovation in the classroom, in this definition the role of technology is more evident in the change of teaching practices. DT is beyond technology and teaching methods, it includes strategic approach (Matt et al., 2015), changing human behaviour, attitudes, culture, and working methods, through the emergence of various digital technologies (Majchrzak et al., 2016; Kane et al., Citation 2015). Farid (2022) describes the situation during the pandemic, noting that it forced many sectors to adjust quickly to new business norms, including the higher education sector. Students and faculty in higher education have faced unprecedented challenges, leading many institutions to transition to online teaching and learning immediately. Therefore, in reference to Hodges et al. (2020), who differentiated between well-planned online learning experiences and courses offered online in response to a crisis or disaster, successful DT requires preparation, including comprehensive training for teachers on digital tools and platforms, curriculum redesign, and investment in technology infrastructure. Hence, investigating the shift in teaching and learning skills, knowledge, and technology in the post-COVID phase is a necessary area. Besides, the effectiveness of digital transformation in the Egyptian context may be questionable.

This study captures the changes in tutors' practices (what they do in class) and perception (how they envision the changes in these practices) to relate them to DT and/or ERT and inform leading lessons.

2.6 Teachers' Perceptions

Teachers' perceptions play a pivotal role in shaping their approaches to teaching and learning. These perceptions encompass a range of factors, including values, attitudes, processes, beliefs, and skills. Literature focuses on different areas of these perceptions, such as how technology impacts the teachers' perceptions and attitudes about their role in the classroom (Chin &

Hortin, 1994), and the relationship between self-efficacy beliefs and technology in the classroom (Marcinkiewicz & Regstad, 1996). In the Egyptian context, for Ismail (2017), teachers perceptions include their judgments regarding aspects such as respect, incentives, and control significantly impact their instructional practices. Besides, their expressed attitudes expressed, such as trust in students, willingness to adapt to change, and commitment to personal and professional development, influence their decisions and behaviours in the classroom, highlighting the complex interplay between individual beliefs and broader institutional contexts in shaping teaching approaches.

Prosser & Trigwell (1999), focus on teaching practices and the change in teacher's role. Those who perceive learning as the accumulation of information are more likely to view teaching as the transfer of information. In contrast, teachers who view learning as conceptual change are more likely to view teaching as facilitating conceptual change. As this study focuses on the change in teaching role with regard to practices, the angle of Prosser & Trig well (1999) is the most applicable. Teachers are either more likely to use a teacher-centred approach, where the teacher imparts information to students and uses assessment techniques that encourage and test rote learning, or they are more likely to use a student-centred learning (SCL)approach, where independence in learning is encouraged through discussion, debate, and questioning among students, and assessment that reveals conceptual change.

3. Methods

3.1 Study Design

The study implemented an explanatory mixed-method design approach, combining both quantitative and qualitative methods to provide a comprehensive understanding of the study context, see Figure 2.

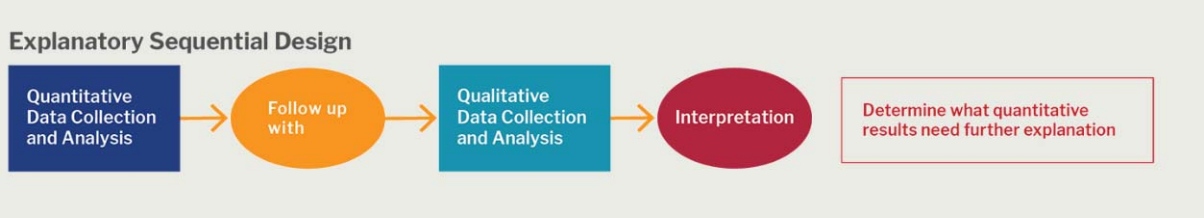

Figure 2. Design of explanatory Mixed methods (Flik, 2018)

3.2 Data Collection Tools

The study employs an explanatory mixed-methods design, started with the survey that provides a broad quantitative framework that identified major trends and areas of interest. These insights were used to formulate detailed interview questions, ensuring that the qualitative phase of the study would explore the nuanced experiences and perceptions of educators, thus providing a comprehensive understanding of the pandemic's impact on higher

education teaching practices.

3.2.1 Development and Focus of Survey Questions

In the survey phase, data is collected from a large sample of participants (n = 51) through surveys. The survey questions were designed to gather quantitative data on the changes in teaching practices, methods, and perceptions of university educators before, during, and after the COVID-19 pandemic. The survey questions cover, broadly, various aspects of teaching practices, including the frequency of online teaching, teaching modes (synchronous, asynchronous, hybrid), use of multimedia and educational strategies, and professional development activities. By collecting quantitative data across these areas, the survey provided a comprehensive overview of the impact of the pandemic on teaching practices. This data helped in identifying significant trends and areas requiring further exploration through qualitative interviews.

3.2.2 Development and Focus of Interview Questions

Qualitative data is collected through in-depth one-to-one interviews with a subset of participants (n = 7). The interviews allow for a deeper exploration of the topics identified in the survey phase, providing richer insights into participants' experiences and perspectives. Interviews were conducted via Zoom or Teams online meetings, lasting one hour, and were audio-recorded, transcribed, and then translated. The interview questions were crafted to investigate the multifaceted impact of the COVID-19 pandemic on university educators' roles, practices, and perceptions. Topics covered in the interviews are such as profession and job description, teachers' perception, CPD and teachers' futures vision. Objectives from conducting interviews are to capture the evolution of educators' roles and responsibilities due to the pandemic. An example of the mechanism between the survey questions and interviews is that data collected from the survey indicated a growing focus on hybrid learning in the post-pandemic period. Therefore, in the interview questions, teachers' perceptions and experiences towards hybrid learning were discussed.

Both surveys and interviews were conducted in Arabic and were translated from Arabic to English using the back-translation method to ensure accuracy.

3.3 Sampling Procedures

The sampling method for teachers is "non-random selection" (Creswell & Creswell, 2018), where the researchers in the team chose individuals for inclusion in a sample without following a random procedure. Non-random sampling was chosen for this study to ensure the relevant selection of participants who have directly experienced the changes being investigated (e.g., working experience in online teaching pre-, during, and post-COVID). In more detail, the research questions were specific to the changes in teaching practices and perceptions due to the pandemic. By using non-random sampling, the researchers could select participants who were most likely to provide detailed and pertinent information related to these specific questions (Creswell & Creswell, 2018). This method is more effective in providing relevant, detailed, and high-quality data necessary to understand the specific impact of the COVID-19 pandemic on university educators' roles and practices.

Regarding the qualitative interviews, data saturation has been discussed between researchers to agree to the point at which no new data or themes are emerging from the data set, indicating that the data have been fully explored. Therefore, for saturation, we used the PRICE model, which helps researchers reach the saturation point in thematic analysis (Naeem et al., 2024). The image below (see Figure 3) details the steps researchers go through to reach saturation in data collection. During the crystallization phase, where researchers take a break from data analysis to reflect on what they have learned and connect themes, it becomes apparent if more interviews are needed.

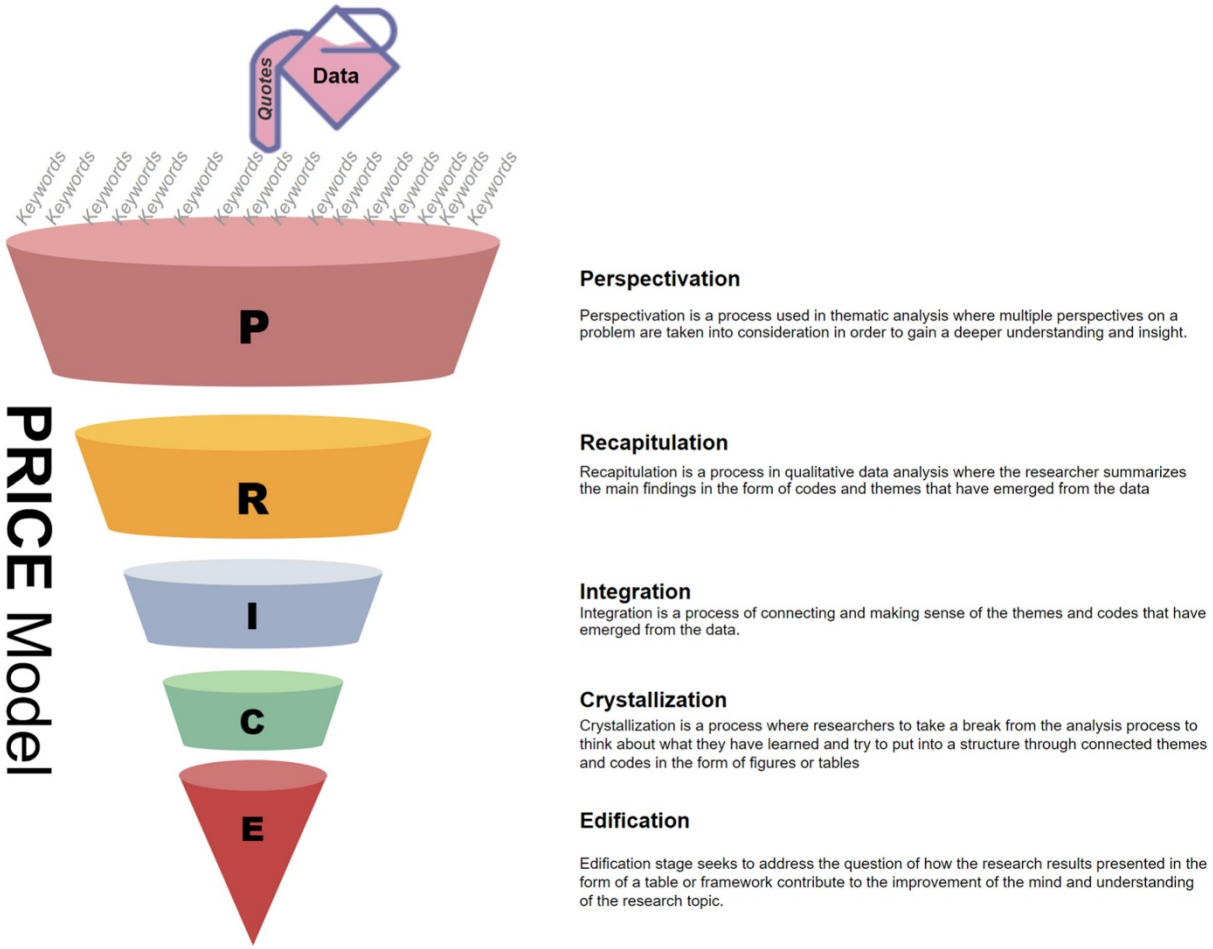

Figure 1. Saturation of thematic analysis (Naeem et al., 2014)

As a reminder, the study aims to answer the below research questions.

1) What changes have occurred in job roles, teaching tools and strategies as a result of the pandemic?

2) How do educators perceive the change in their role in teaching and learning?

3) What are the takeaway lessons from this lived experience?

3.4 Data Analysis

The collected data were analyzed systematically to explore the challenges and opportunities faced by educators in adapting to online teaching modalities during and after the pandemic (Braun & Clarke, 2006). The survey aimed to gather information on teachers' demographics, including their areas of expertise such as social or physical sciences, and to assess changes in the learning environment and teaching resources before, during, and after the pandemic. Additionally, the survey sought to understand teachers' workload outside of teaching responsibilities. The interview focused on teachers' experiences in teaching online before and after the pandemic, as well as their current experiences in teaching. These main topics allowed for a comprehensive exploration of the challenges and opportunities faced by educators in adapting to online teaching modalities during and after the pandemic.

For quantitative data analysis (Survey): Microsoft Excel, was used to perform statistical analysis to provide a general overview of the changes in teaching practices, the adoption of online tools, and the perceived effectiveness of different teaching methods during the pandemic. For qualitative data analysis (Interviews): NVivo was used to manage, code the data and develop themes.

3.4.1 Point of Integration

The integration of quantitative and qualitative data occurred at multiple stages in an explanatory sequential design (see Figure 4).

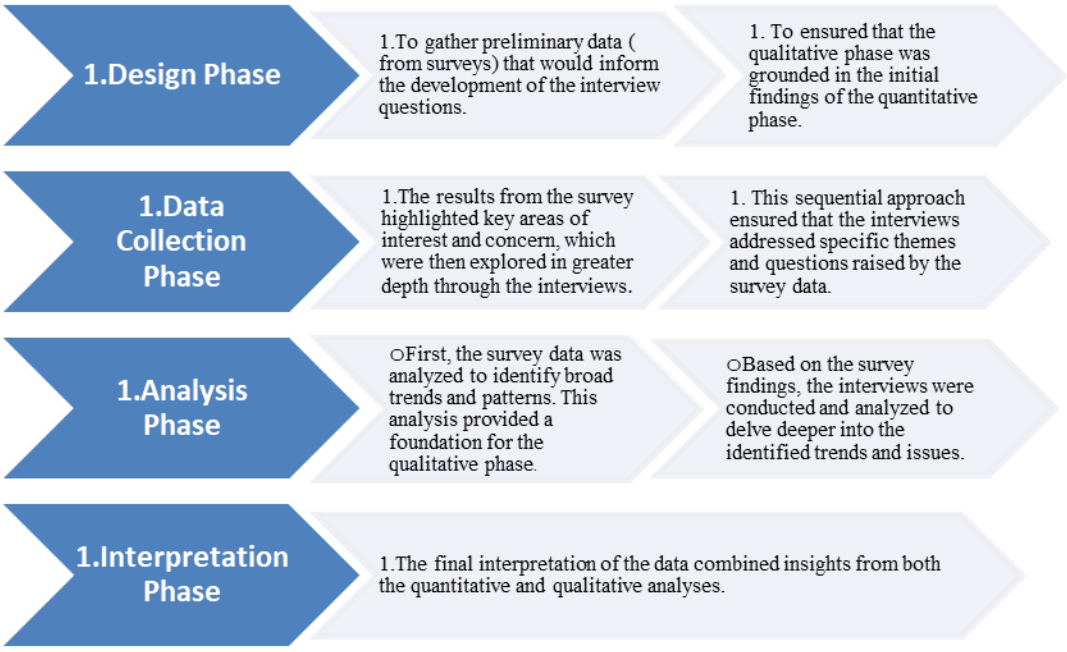

Figure 2. Integration between quantitative and qualitative data

The above framework clarifies the data analysis process and the point of integration, demonstrating the methodological rigor and coherence of the study.

4. Results

4.1 Part 1: Survey Results

Survey results target four main areas: (1) Who are the participants in this study? (2) What learning mode do they use the most (pre-writing and post) COVID? (3) Within teaching, what tools are used? (4) How do teachers distribute their time beyond teaching within working hours?

It is to note that the data below includes the pre-pandemic data alongside post-pandemic changes adds depth, context, and longitudinal perspective to the study of teaching and learning during and after the pandemic. It enriches the analysis, facilitates better interpretation of findings, and informs future directions in education.

4.1.1 Demographics of Participants

The below table shows who are the participants in this study, including their age, gender and their areas of expertise in teaching; physical (e.g. Engineering) or social science (e.g. Education) (see Table 2).

Table 2. Demographics of participants

Data collection tools	Total number	M	F	Physical science	Social science
Survey	51	65% M (33 tutors)	35% F (18 tutors)	43% (22 tutors)	57% (29 tutors)
Interview	7	4	3	3	4

- Age: majority (78%) of participants were between 30-60 years old. In details, 29% of participants were between 40-49 years old, 25% of participants were between 30-39 years old and 24% of participants were between 50-59 years old
- Total percentage of tutors who have previous experience in online teaching before the Pandemic is 33% (20 tutors) and 61% (31) experienced online teaching or the first time in response to the pandemic.

4.1.2 Learning Environment; Pre, and Post the Pandemic

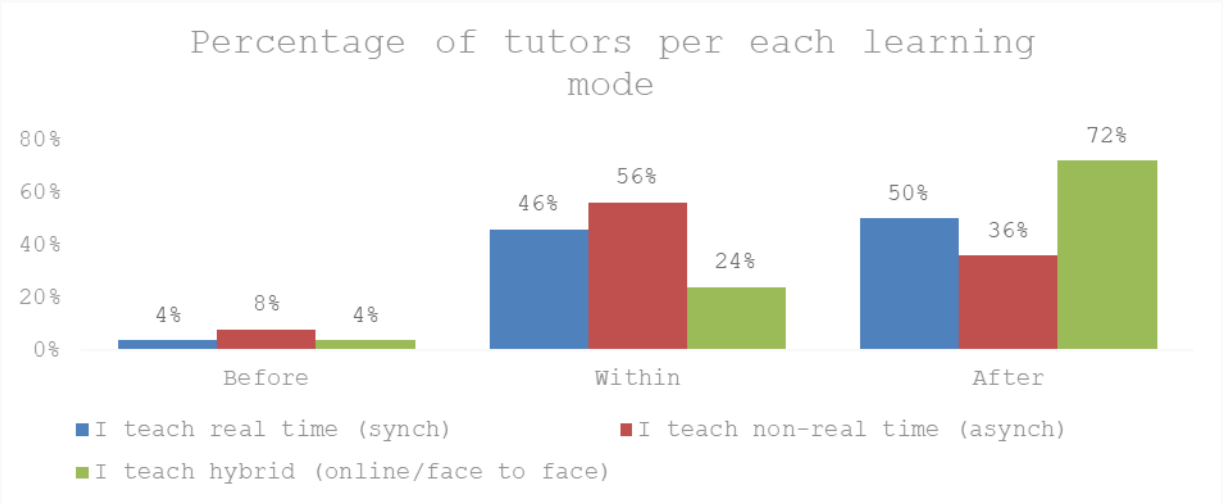

Figure 3. Mode of teaching online (real time, non-real time, hybrid)

According to the Figure 5 above.

- Before the pandemic, universities had non- real time meetings more than real time and hybrid mode.
- Within the pandemic, real time meetings increased significantly, and there is increased use to the other two modes. It is to note that within the pandemic, according to HE regulations, there were opportunities between wave 2 and wave 3 to allow f2f meetings between students and tutors considering social distance regulations. That explains the increased percentage of hybrid (within the pandemic)
- After the pandemic, hybrid learning has the highest compared to real and non-real time learning modes.

4.1.3 Teaching resources before, during, and after the pandemic

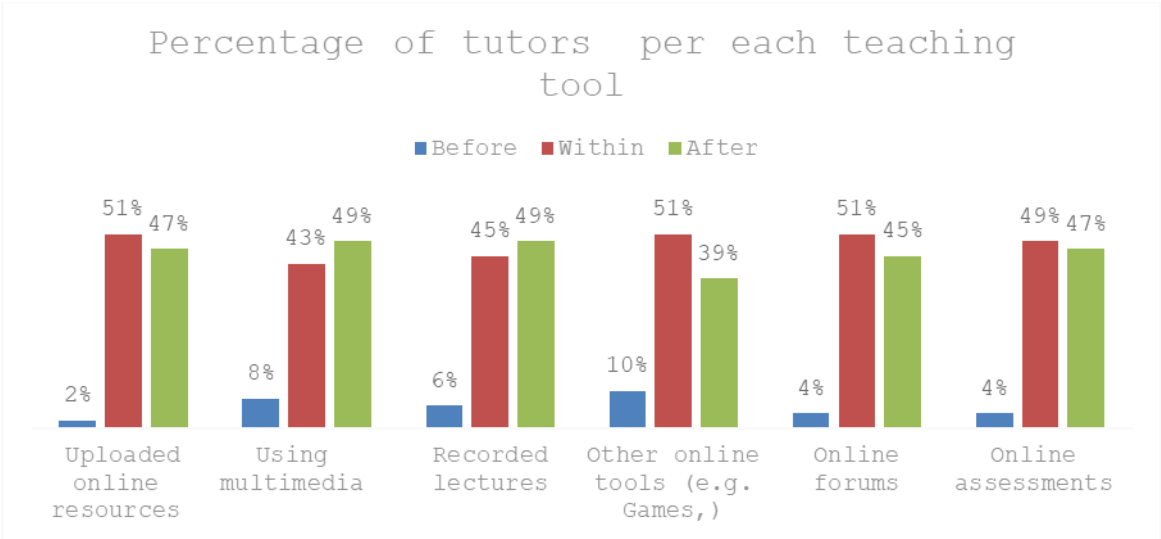

Figure 6. Teaching resources before, during, and after the pandemic

According to Figure 6 above.

- Before the pandemic, few uploaded resources have been used, while other online tools have been used such as games, simulations, etc.
- Within the pandemic, it is statistically significant that there is an increase in all online learning tools, uploaded resources are the highest and tutors used other online learning tools
- After the pandemic, interestingly, other online learning tools have recorded the least number of users. Meanwhile there is an increasing number of tutors (compared with within the pandemic) who record lectures and using multimedia.

4.1.4 How do teachers distribute their time beyond teaching within working hours?

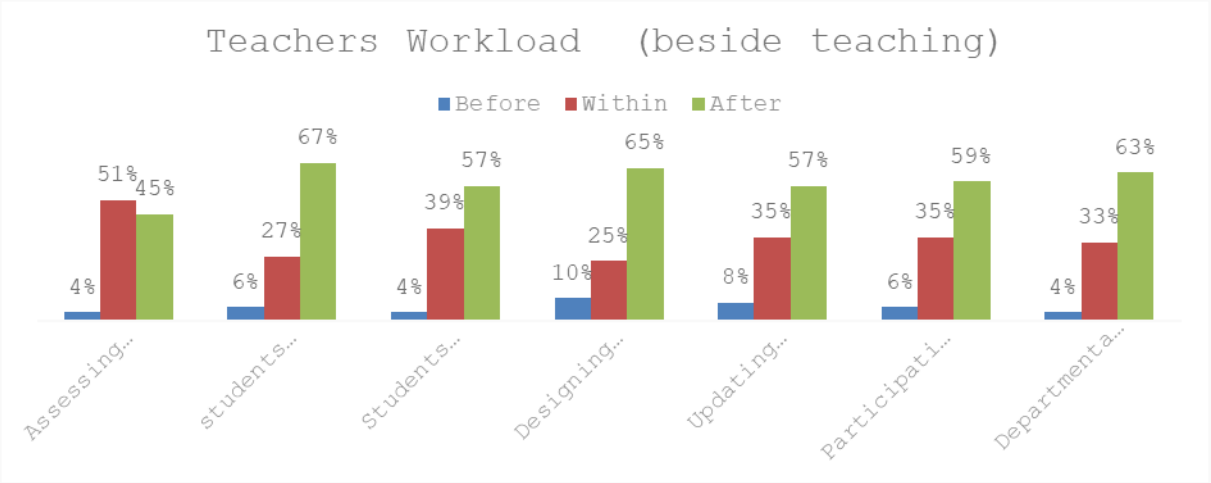

Figure 7. Teacher's workload

- According to Figure 7 above, there is significant increase in the use of teachers time beyond teaching after the pandemic. Students advising and developing course materials with departmental meetings have the highest and pretty similar percentage of teacher's time (67%, 65%, 63%) respectively. Interestingly, 45% of teachers (the lowest percentage) who used the time in students assessment. This is confirmed by interviews that denoted e-assessment as merit of teaching online.

4.2 Part 2: Interview Results

Many teachers narrate positive experience from professional perspectives and indicate that there are positive gains form the lived experience in the pandemic that should be maintained with regard to the teaching professions including how they teach, how students learn. However, it is observed that the (how to) maintain these learned lessons had not been explained, states.

> "We need to keep the gains from the experience we lived during Corona, we do not want to lose what we gained, we became tech-tendency teacher, less in-person teaching and all my modules have been digitalized." (Int 4)

4.2.1 Teaching Profession

From professional perspectives, teachers narrated their lived experience in various teaching activities including hybrid learning environments and its merits, where the blend of face-to-face and online teaching is ongoingly introduced. They highlighted the promise of e-assessments in advancing online learning, alongside changes in assessment methods emphasizing feedback and collaborative projects. Personal Development Plans (PDPs) are crucial, as educators prioritize skills development like e-assessment methods. Additionally, teacher autonomy is emphasized, with responsibilities ranging from leadership tasks to technology integration. However, challenges persist, with non-real sessions proving ineffective and limitations in teaching practical skills online, particularly in physical science fields such as medicine. (see Figure 8).

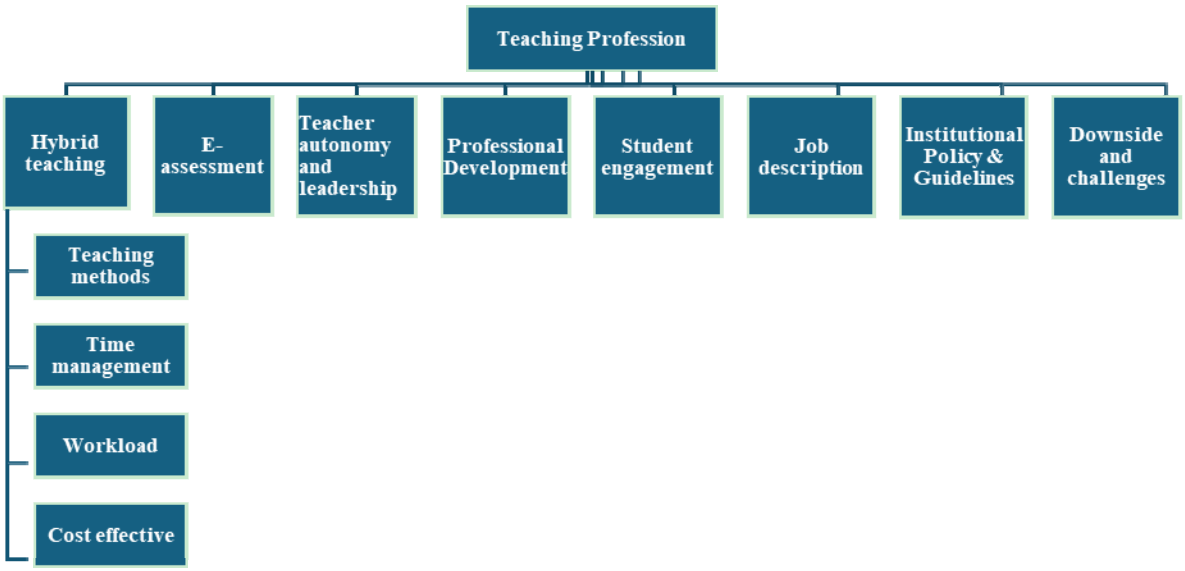

Figure 8. Summary of Teaching practices

1) Hybrid teaching

2) Different teaching methods

"Hybrid teaching has been introduced practically and ongoingly, where we have been introduced to blended learning between face-to-face and online learning environments, Hybrid learning gives merits to teaching (digital books, online platforms, and e-assessments). I have more colours in the palette (flipped classroom, multimedia, videos) (Int 1)

3) Time management and flexible

“The difference between traditional and hybrid learning lies in their approach to scheduling and location. Traditional learning confines instruction to specific times and places, typically within physical classrooms. However, this limitation can be surpassed by hybrid methods,

which offer more effective and flexible teaching strategies." (Int 3)

4) Online is cost-effective

"Hybrid learning is regarded as cost-effective, offering a balance between online and in-person instruction. Online learning is recognized as a money-saving option, particularly for managing large class sizes. The resources developed during the pandemic underscore the importance of utilizing them efficiently to achieve cost-effectiveness." (Int 2)

5) Workload decrease

"Introducing hybrid mode and its well perception led to decreased workload, reducing resources for teachers and students as they will need to be less in-person in campus." (Int 3)

6) Hybrid is a Backup plan

"Hybrid is a plan B learning environment. Online teaching is a backup plan or alternative when circumstances necessitate it. Online is effective but not stand-alone, plan B teaching F2F is more rewarding for me as a teacher. I sometimes use it as a complimentary complementary for a discussion for things that they don't understand for the exam. If anyone has a question, you can make a zoom meeting for half an hour. OK, so something that was difficult and they want me to repeat it. Things like that. Yeah. OK. But I don't"" (Int 6)

4.2.2 E-assessment

"E-assessments have shown promise as a step forward in the online learning journey. There has been a change in assessment methods, with assessments conducted online and formative assessments held off-campus. Assessments are followed by feedback, and group work and collaborative projects are emphasized." (Int7)

1) Teacher Autonomy and Leadership

"Facilitating leadership and management by tutors, including tasks such as attendance monitoring, resource allocation, and in some cases, budget management." (Int2)

2) Continuing Professional Development (CPD)

"Compulsory and ongoing CPD to keep teachers up-to-date with technology and can be more effective in driving participation and motivating individuals to pass and advance in their careers." (Int 4)

3) Personal Development Plan (PDP)

"Each teacher needs to plan their needs in their individual professional development plan. For instance, I need to learn about e-assessment methods, so I will look for resources online." (Int4)

4) Job Description

"There have been changes in job descriptions, with a shift towards being a digital tutor. This requires the use of technology in all aspects of teaching and learning. It has become necessary

to develop skills to effectively teach online and to find ways to communicate with students. Teaching, assessment, citizenship, and research activities have all transitioned to digital platforms. Virtual classrooms, Virtual Learning Environments (VLEs), video conferencing tools like Zoom and Google Meet, flipped classrooms, and online assessments using tools like Google Forms have become common in the online teaching landscape." (Int7)

5) Institutional Policy & Guidelines

“With the change occurring More policies and strategies towards Technology-enhanced learning and e-assessments, are needed. For example, Departmental meetings, should be online in some occasions. We go to the campus to attend face-to-face meetings, while online can serve in this occasion.” (Int4)

6) Downsides of the Experience

"Non-real sessions are ineffective. Online teaching requires a lot of work to support student engagement, such as quizzes and rewards." (Int4)

"Demonstrating skills through online teaching, even though video or YouTube, has limitations. Students often want to see the procedure or instrument size in person. Certain skills, such as how to take a patient's blood pressure, cannot effectively be taught or assessed online." (Int7)

4.2.3 Teachers’ Perceptions

Teachers perceive digital transformation as necessitating a shift in their roles, prompting a change of teaching methods and their impact on students. They emphasize the importance of preparedness for hybrid learning while recognizing the benefits of face-to-face instruction as superior to online methods. (see Figure 9).

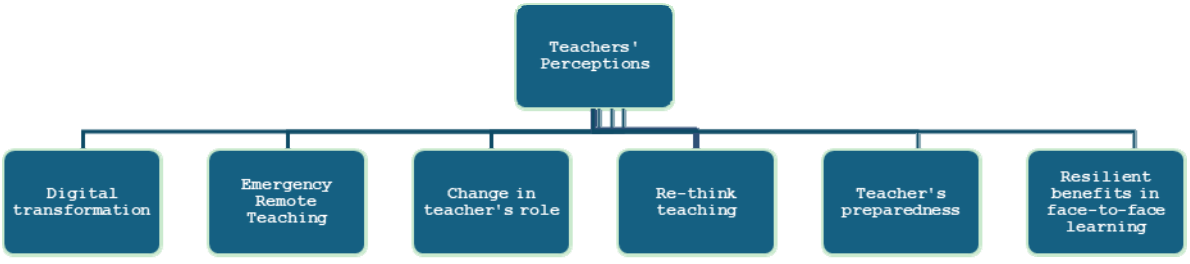

Figure 4. Summary of Teachers' perceptions

1) Digital Transformation

“Digital transformation has become paramount in education, with a transition to hybrid learning emphasizing flexibility in instructional delivery methods to cater to diverse needs and circumstances.” (Int 4)

“The shift to digital transformation, akin to a technological tsunami, necessitated rapid adaptation among institutions and educators to ensure effective online teaching and learning. Lessons were learned, and changes were made to adapt to the evolving educational landscape.” (Int 7)

2) Emergency Remote Teaching

“What has happened during COVID was Emergency Remote Teaching (ERT), So when it's already part of the system, so you can develop, but it's not something emerge outcome of our circumstance. (Int 6)

3) Change in Teacher’s Role

"There is a change in my role with the existence in technology; it became the main provider of learning to students, not only me." (Int 1)

"TEL is no longer a choice but a requirement for effective teaching and learning. Educational institutions need to prioritize technology integration to be prepared for unforeseen circumstances. Teaching has become less about spoon-feeding. Increased Q&A sessions aim to engage students in online sessions, leading to stimulated creative thinking." (Int 4)

“Change in teacher’s role requires Job role pre-requisites aligned with ongoing CPD […] There is a change in what is needed from the teacher, we need to improve raising awareness about e-learning in different communities and aligning it with the job market's need.” (int 5)

4) Rethink Teaching

Teachers need to believe in the efficacy of e-learning as active learning, challenging the notion that traditional face-to-face methods are the only effective approach. (Int 1)

"Teaching now became more flexible, student-centred, and different teaching tools have been introduced such as flipped classroom and online games-based learning. Besides, different educational methods are integrated such as More pedagogical approaches (PBL)." (Int 5)

5) Teachers' Preparedness

"As educators, preparing teachers for hybrid learning is imperative to meet the evolving needs of our students in today's digital age. Emphasizing digital awareness not only equips teachers with essential skills but also fosters a more inclusive and adaptive learning environment. By embracing hybrid teaching methods and promoting digital literacy, we empower teachers to effectively engage students and navigate the complexities of modern education." (Int 6)

Examples of the required preparedness includes Curriculum (ethical considerations, code of

conduct, privacy, and the rights and responsibilities of both tutors and students in the online learning environment. These topics should be part of the preparation for online learning (int 7)

6) Benefits of traditional Approach Outweigh the Benefits of the Online

"In-person presence remains essential in teaching, providing invaluable opportunities for interaction and engagement with students, fostering deeper connections and understanding." (Int 2)

"Teachers' resistance to change and fear of technology hinder progress, preventing educators from fully embracing innovative teaching methods and digital tools that could enhance learning outcomes and student experiences." (Int 4)

4.2.4 Students' Perception

1) Student Engagement

"Engaging students in online learning is a crucial driver of its success. It has become essential for teachers to plan teaching that engages students. For instance, I am considering using tools such as quizzes to make learning fun for my students. They have a positive mindset towards online learning, viewing it favourably as a platform for Student-Centred Learning (SCL), indicating their acceptance and appreciation of this teaching approach." (Int2)

"There are positive impacts of integrating technology in teaching and online learning on students. They transition from higher-order thinking (being creative and analytical) to lower-order thinking based solely on remembering and understanding." (Int 1)

2) Non-inclusive

Students prioritize equity, inclusiveness, and preparedness in their educational experiences, emphasizing the importance of ensuring that all students have equal access to resources and opportunities […] In some remote areas, less available, in practical courses (e.g. medicine) less favourable." (Int 3)

3) It is not one size fits all

"Students perceive that online learning may not be suitable for all subjects, such as medicine, where assessments could potentially encourage dishonest practices. Additionally, fields like engineering may face challenges in conducting practical fieldwork effectively in an online format." (Int 7)

5. Discussion

5.1 Digital Transformation in the Post Pandemic

According to literature defining Digital Transformation (DT), teaching methods have shifted towards more interactive, technology-driven approaches that enhance collaboration and innovation in the classroom (Kaputa, 2022; Brooks & McCormack, 2020). According to the interviews, continued government support and collaborative efforts by educators have the

potential to tilt the scale towards genuine DT. However, DT has been introduced as a concept, yet several crucial aspects remain unexplored. These include changes in all facets of teaching, alterations in teaching methodologies, and shifts in approaches to collaboration and communication for sharing best practices. The interviews reveal two main aspects of what has occurred: organizational adaptation and the impact of pressing circumstances, without a clear pedagogical adaptation. For example, how the shift from teacher centred to SCL approach has been adapted. An important observation is the lack of emphasis on communication and collaboration among teachers. This oversight needs addressing, as noted by Kaputa (2022), DT entails significant changes in educational paradigms through the integration of information, computing, communication, and connectivity technologies.

1) Changes in teaching job role

According to the study findings, there is change in teacher's role, from professional and individual and mindset perspectives. Teachers rethink teaching with regards to how they teach, how students learn, and what is expected from the teacher. Technology has been reported to take the lead in teaching, The latter claim might contradict with (Seufert et al., 2021) who addressed that still teacher leads and designs learning, and the tool is technology (it is a vehicle to achieve learning and the teacher is the driver of this vehicle.)

5.2 Hybrid Learning

Hybrid learning includes both in-person and online meetings that are planned ahead of time so that learning goals can be communicated directly during face-to-face learning. Hybrid learning in the post pandemic will be the main course offerings, (Singh et al., 2021; Farliana et al., 2023)

Hybrid learning environment has been strongly and positively endorsed in both interviews and surveys. Its benefits have been highlighted across various dimensions, including economics (cost-saving due to reduced facility needs), teaching strategies (leveraging advantages of both face-to-face and online modes), and work environment improvements (reducing workload by minimizing on-campus attendance and providing recorded lectures for flexible student access). These advantages have been corroborated by (Essa, 2023; Farliana et al., 2023). Moreover, learners develop better learning outcomes when they are exposed to hybrid and digital learning environments (Henderson et al., 2017). There are two main missing points in the narrated experience by HE academic n the interview; (1) the ratio/aspect of blended between f2f and online (2) collaboration in hybrid learning.

It is noted that the ratio of hybrid mode, specifically the proportion of face-to-face hours versus online instruction, was not explicitly discussed in the interviews. According to (Fong, Kwan and Wang, 2008), this ratio is flexible and aids in decision-making processes regarding course structure and delivery methods, ultimately facilitating... According to Kwan and Wang, 2008), the components (time, pace, see table xxx) can be combined by different degrees, so that for instance in one organization the proportion of face-to-face to distance learning could be 40% to 60%, while in another community it could be 30% to 70%. A given business can decide what ratio of face-to-face and distance-learning would fit their learning objectives best.

This flexibility is well-situated with the concerns by one tutor who teaches medicine and stressed on the need to f2f teaching for lab work is not subject to be replaced by online session.

The second missing aspect in the collected data is the collaboration between students in hybrid learning, according to Banyon et al (2016) blended learning model that encourage communication and collaboration between teacher, students and students themselves and utilizes social learning network principles increased students' engagement and improved their understanding to the lesson.

There is a clear need for conducting studies to demonstrate effectiveness of blended and hybrid instruction and how instructors can work on designing their classes making it a viable option during current times and as we prepare to teach in the post-vaccine and post-pandemic world.

5.3 Flexibility

Flexibility is a fundamental characteristic of hybrid teaching, allowing educators and learners to customize their experiences for optimal engagement and learning outcomes (Doyle, 2011). It manifests in two main forms: (1) flexibility of learning resources, including access to course materials, interactive multimedia content, adaptive platforms, and supplementary resources, all catering to diverse learning needs; and (2) teachers' adaptability in online learning, seen in their adjustment of teaching methods, materials, and accessibility support to accommodate students' varied requirements. This adaptability, crucial in an evolving educational landscape, has been further enhanced during the pandemic, as educators continue to refine their strategies for remote instruction, ensuring inclusivity and effectiveness in virtual learning environments (Seufert et al., 2021). Flexibility and adaptability to change have been noted in the collected data as a response to shifts in the teacher's role post-pandemic. For instance, educators have engaged in ongoing exploration and adjustments to strategies aimed at delivering course material remotely. This includes the development of more robust course materials to accommodate students who may not be able to physically attend class consistently.

5.4 Teachers' Leadership Skills

According to the data findings, teacher leadership and autonomy have been positively acknowledged, involving tasks such as attendance monitoring, resource allocation, and, in some cases, budget management. Teachers' COVID-19 experiences have led to a notable development in their leadership skills. Throughout the pandemic, educators have demonstrated adaptability, resilience, and innovative problem-solving abilities in navigating the challenges of remote and hybrid learning environments (Hodges et al., 2020). As they transitioned to online teaching and learning, teachers took on leadership roles in guiding their students through unfamiliar technologies, troubleshooting technical issues, and providing emotional support during times of uncertainty (Schunk et al., 2020). Moreover, teachers have shown leadership in collaborating with colleagues to share best practices, develop new instructional strategies, and coordinate efforts to ensure continuity of learning for their

students (Hodges et al., 2020). These experiences have not only enhanced teachers' technological proficiency but have also fostered their capacity for instructional leadership, strategic planning, and effective communication in challenging circumstances (Schunk et al., 2020). Consequently, teachers have emerged from the COVID-19 pandemic with strengthened leadership skills that will continue to benefit them and their students in future educational contexts.

5.5 Students' Engagement

For students, hybrid learning makes it easier for them to catch up if they miss class for any reason, and the reduced need to travel to school saves considerable time, potentially increasing their interest in learning (Karmini et al., 2023). Student engagement in hybrid learning has been observed in the collected data. However, students may face challenges accessing necessary software, hardware, or Internet connectivity, particularly in low-income or rural areas, leading to a phenomenon known as the digital divide. This discrepancy in access can create inequalities in educational opportunities and hinder students' academic performance if they struggle to participate in online classes or complete assignments (Sulaiman et al., 2023). In the study context, the emphasis on engaging students' voices and ensuring inclusion differs from previous literature. Pre-COVID literature (Waddell, 2013; Ismail et al., 2017) indicated less prominence of student voices, highlighting a need to bridge the discussion gap between tutors and student's post-pandemic. These calls underscore the importance of higher education tutors facilitating critical thinking among students, encouraging analysis, evaluation, and reflection on their own learning.

5.6 Challenges and Opportunities in Implementing Technology in Teaching and Learning

1) Better working conditions

The lived experience during Covid and the follow-up period has provided many opportunities that help enhance the quality of learning when technology is integrated, including improvements in teachers' working conditions, hybrid learning, and reduced workload in large classroom management. Technology offers opportunities to streamline administrative tasks and facilitate classroom management, alleviating the burden of large class sizes on educators in the Egyptian context (Kaoud, 2021; El-Sayad et al., 2021).

2) Innovative educational approaches

Professionally, according to the study findings, innovative educational approaches have been integrated into teaching practices. The use of videos and multimedia has significantly increased post-COVID, along with the adoption of problem-based learning and question-and-answer teaching styles. Many educators have embraced student-centred learning approaches, which marks a positive improvement compared to previous studies (Ismail, 2019). Essa (2023) emphasizes the importance of spreading awareness about developing suitable learning contexts for hybrid learning across different educational levels and settings.

3) Resistance to Change

Despite the potential benefits, educators may encounter resistance to the adoption of technology due to various factors such as pedagogical beliefs, lack of confidence in technology use, or apprehension about the perceived complexities associated with integrating technology into teaching practices (Ertmer, 2005). Overcoming this resistance requires targeted professional development initiatives that address educators' concerns and provide them with the necessary support and training to effectively incorporate technology into their pedagogy (Ertmer & Ottenbreit-Leftwich, 2010).

4) Students' Inclusiveness

with disparities in access to technology and internet connectivity disproportionately affecting marginalized and underserved student populations (Warschauer & Matuchniak, 2010). According to the World Bank (2020), inequities in learning opportunities among Egyptian youth are high compared to other countries in absolute levels, and learning gaps appear in the early grades. This lack of access exacerbates existing inequalities in educational opportunities and can hinder students' ability to fully participate in technology-mediated learning environments. Addressing this challenge requires comprehensive strategies to bridge the digital divide, including initiatives to provide equitable access to technology resources, digital literacy training programs, and community partnerships to support underserved communities (Warschauer, 2006).

5.7 Take Away Lessons

As takeaway lessons informing the current situation of teachers post-COVID, two frameworks (knowledge & competency) have been developed. These frameworks can be integrated as part of their Continuing Professional Development (CPD) both at the beginning of their job roles and ongoing thereafter.

1) Framework 1 (Teacher's knowledge)

An edited version of TPACK (Mishara & Koehler, 20026) (see Figure 10), where teachers need to be equipped with a range of knowledge, skills, and competencies to effectively fulfil their responsibilities. Key areas include:

- *Content Knowledge*: Teachers should have a deep understanding of the subject matter they will be teaching, including key concepts, principles, and theories.
- *Pedagogical Knowledge:* They need knowledge of effective teaching methods, instructional strategies, and classroom management techniques.
- *Technology Skills:* Basic proficiency in using educational technology tools and resources is essential, as technology is increasingly integrated into teaching practices.
- *Knowledge of learners*: Teachers should be aware of the diverse needs, backgrounds, and learning styles of their students, as well as strategies for supporting inclusive classrooms.
- *Knowledge of Educational Policies*: Familiarity with relevant educational policies, curriculum frameworks, and assessment guidelines is important for ensuring compliance and alignment with educational standards.

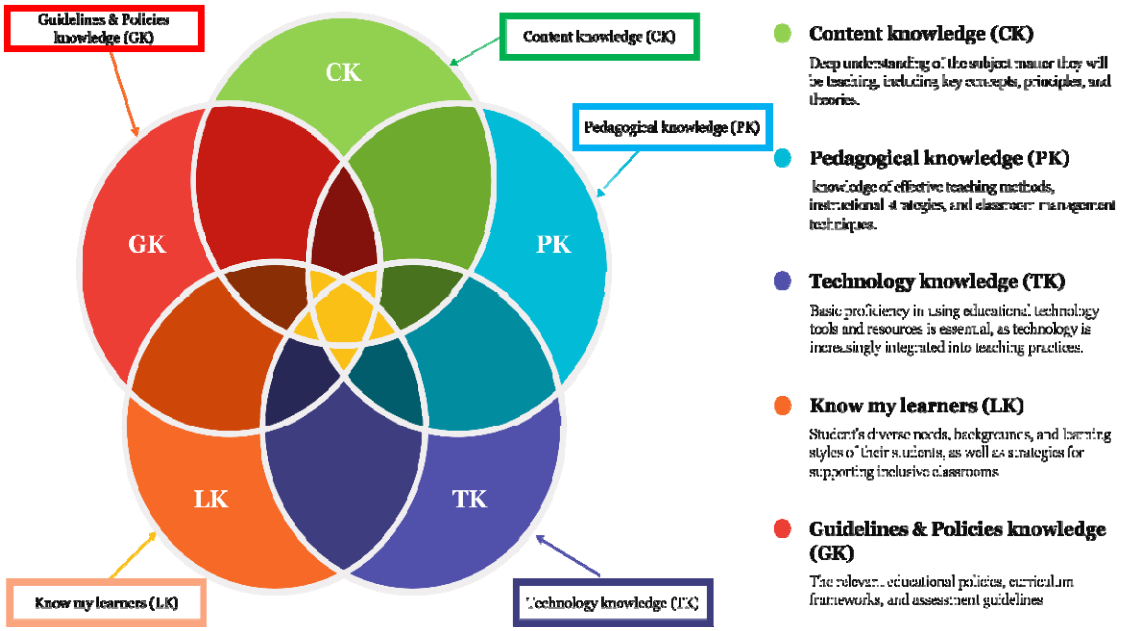

Figure 10. Modified TPACK framework of Teachers' knowledge

2) Framework 2 (Teacher's Competency)

A created version of some elements informed by study findings in teacher's competency (see Figure 11).

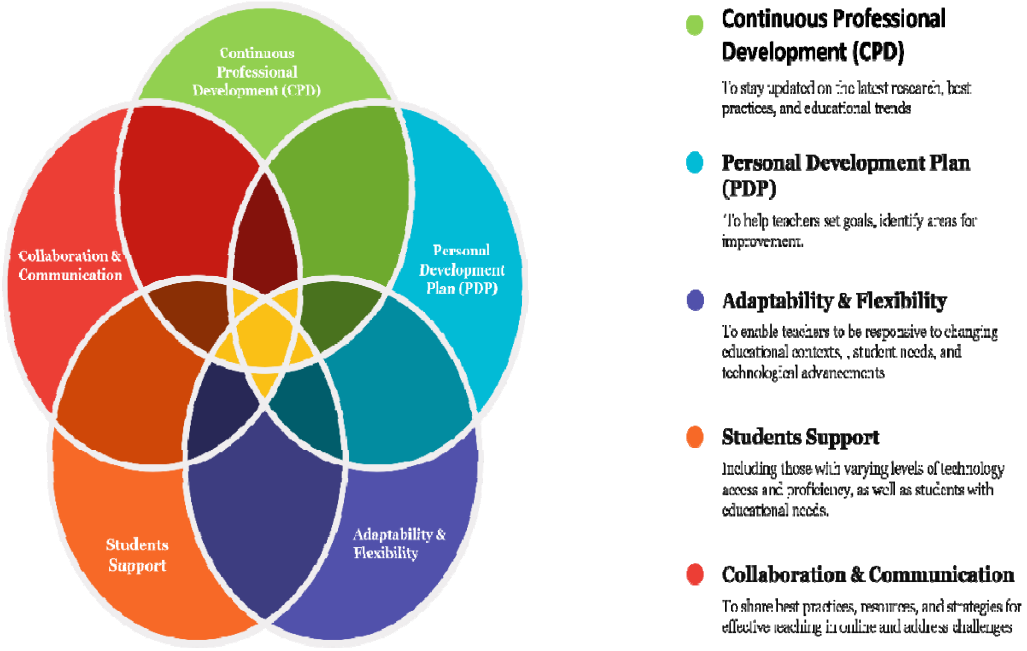

Figure 11. Framework of Teachers' Competencies

Professional Development: Teacher training and support are the major challenges in implementing hybrid learning (Sulaiman et al., 2023; Moursy, 2023). Teachers may require additional training and support to effectively integrate creative teaching practice into a hybrid learning environment. According to the study findings, interviewees show great awareness about the role of Professional development provided by the institution (CPD (or initiated by them as Personal Development Plan (PDP). According to the survey results, there is an overall agreement on the value of the provided CPD. However, 45% and 49% of teachers are neutral about the impact of CPD on their competence and confidence, respectively. Moreover, PDP has been mentioned only once in the interviews, and in one instance, an example was provided (e.g., subscribing to Coursera to learn about web design). Therefore, Faculty members need training and support to develop new effective teaching methods in a hybrid learning environment.

Adaptability & Flexibility: Teachers need to be adaptable and responsive to changing circumstances, such as shifts between in-person, hybrid, and fully online modes of instruction. This requires them to navigate between physical and virtual classrooms, creating a seamless learning experience for students in both environments.

Supporting Learners: Teachers are placing greater emphasis on supporting diverse learners, including those with varying levels of technology access and proficiency, as well as students with special educational needs. This involves implementing differentiated instruction and providing additional support as needed to ensure all students can succeed in their learning journeys.

Collaboration and Communication: Teachers are working collaboratively with colleagues to share best practices, resources, and strategies for effective teaching in online, hybrid, and in-person settings. Additionally, effective communication with students, parents, and stakeholders has become essential for ensuring continuity of learning and addressing any challenges that may arise.

6. Study Limitations

Three main limitations that need to be considered in future studies; (1) Small Sample Size: The study's findings may be limited by the relatively small number of participants, which could impact the generalizability of the results. A larger and more diverse sample would provide a more comprehensive understanding of the issues surrounding digital transformation in education. (2) Regional Bias: Participants were primarily from the northern region of the country, potentially leading to a regional bias in the findings. Including participants from the southern region, where there may be lower dedicated budgets and different educational challenges, would provide a more balanced perspective on the impact of digital transformation across the country. (3) Self-Reporting Bias: Participants' responses may be subject to self-reporting bias, where they may provide socially desirable responses or exaggerate their experiences. Implementing additional validation measures or triangulating data from multiple sources (e.g. lesson plan, created online resources, students' views) could help mitigate this bias.

7. Future Work

Future work to maintain the gains form COVID experience, more research is needed to focus on three key areas:

- *Collaboration and Communication*: There is a need for further exploration into the dynamics of collaboration and communication in hybrid learning environments. This includes understanding how teachers and students engage with each other, as well as how students communicate among themselves. Research should investigate strategies for initiating, sustaining, and maintaining effective communication and collaboration in hybrid settings. For HEIS, constant societal dialogue and targeted communication between HEIs, government, the private sector and civil society plays a key role in achieving greater social impact (Kaputa, 2022).
- *Meeting Student Needs*: While the study identified teachers' awareness of students' needs and concerns about inclusivity, future research should delve deeper into two specific areas. Firstly, there is a need to explore strategies for teachers to better understand their learners, build rapport, and respond to individual needs effectively. Secondly, at the institutional and national levels, efforts should be made to bridge the gap between students, particularly those from public universities, by providing on-campus services such as flipped classrooms with a mirrored model, low-tech solutions, and offline resources. Research in this area should examine effective approaches to address these disparities and enhance the learning experience for all students.
- *Teacher Personal Development Plan (PDP):* Another important area for future research is the development of personal development plans for teachers. There is a need to focus on strategies and interventions that support teachers' professional growth and well-being, ensuring they are equipped with the necessary skills and resources to thrive in hybrid learning environments. Research should explore effective methods for implementing personal development plans and their impact on teacher effectiveness and job satisfaction.

8. Conclusion and Recommendations

The role of teacher's post-pandemic has undergone significant changes compared to before in the study context. With the emergence of hybrid learning as a prominent mode of instruction, teachers now face new challenges and opportunities. There is a greater emphasis on flexibility and adaptability, with teachers integrating innovative educational approaches such as video-based instruction, problem-based learning, and student-centred approaches. Collaboration among educators has not gained importance, and there is not a heightened awareness of addressing students' learning gaps. Overall, the post-pandemic landscape calls for a more dynamic and responsive approach to teaching, with a focus on continuous professional development and personalized learning plans for educators. The study reflects on the impact of digital transformation (DT) in the post-pandemic educational landscape, highlighting significant shifts in teaching methods, teacher roles, and learning environments. Despite the introduction of DT concepts, there remain crucial unexplored aspects such as changes in teaching methodologies and approaches to collaboration. Notably, hybrid learning has emerged as a prominent mode of instruction, offering economic, strategic, and

pedagogical advantages. However, there are gaps in understanding the blended ratio and fostering student collaboration in hybrid environments. Flexibility and adaptability have been crucial for educators, enabling them to navigate the challenges of remote and hybrid teaching effectively. Moreover, teachers have demonstrated enhanced leadership skills during the pandemic, emphasizing the importance of continuous professional development and personalized learning plans. Additionally, addressing the digital divide among students remains a significant challenge, requiring comprehensive strategies to ensure equitable access to technology and opportunities for learning. There are gains from the lived experience during Covid that require ongoing efforts to maintain. The study concludes with the below recommendations.

- Enhanced Professional Development and Teacher Competency: Implement targeted professional development initiatives to address educators' concerns and enhance their confidence in integrating technology into teaching practices effectively. Provide ongoing support and training to equip teachers with the necessary knowledge and skills for digital transformation.
- Comprehensive Strategies for Bridging the Digital Divide: Develop comprehensive strategies to bridge the digital divide among students, particularly in marginalized and underserved communities. This includes initiatives to provide equitable access to technology resources, digital literacy training programs, and community partnerships. Besides, prioritizing student engagement and inclusiveness in educational practices. Bridge the gap between tutors and students by facilitating critical thinking and encouraging active participation in learning processes.
- Research on Hybrid Learning Effectiveness: Conduct studies to evaluate the effectiveness of hybrid learning and explore strategies for designing classes that optimize blended learning environments. Focus on understanding the blended ratio and promoting collaboration among students in hybrid learning settings.

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