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Opportunities and Challenges to Educators When Transitioning to a TEL Environment – Case of Kuwait

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Abstract – Technology-enhanced learning (TEL) is rapidly becoming relevant for its ability to incorporate new and emerging technologies into education that can promote better learning, circumvent issues in traditional classroom environments, and engage learners more effectively. This paper provides an introduction and background to TEL, explains several theories that undergird the use of TEL, provides a literature review that examines TEL in several contexts, describes the methods used for the study, and details the results obtained. From a theoretical standpoint, TEL is primarily associated with disruptive innovation, because it changes the way things are done. Multidisciplinary as a component of activity theory is another salient feature of TEL and situated learning theory is used to explain why haptic feedback improves TEL effectiveness. The literature review discusses different aspects of TEL that have been studied, and the methods section describes how the data was collected and analyzed. The research findings and recommendations are based on the data collected through online survey and its analysis. The data used in this research is mostly primary. The participants were from Kuwait and the recommendations are suitable for Kuwait Technological learning environment. One of the important findings of the research was that participants agreed that big data is influencing the educational sector due to the sudden shift to online teaching and is creating a common use experience for everyone who is part of it. Another important research was that most of the educators feel that TEL supports the individual growth of a learner. In addition, educators believe that TEL will be more effective if senior management supports them and there is a TEL support center to assist when needed. The current situation that we are facing because of COVID-19 has given TEL a strong foundation as educators are using it like never before. This has also enabled the TEL to grow and adopt to new situations and teaching environments..

Keywords – Technology-enhanced Learning, TEL, Kuwait, Technology, Digital

I. INTRODUCTION

Technology-enhanced learning (TEL) is a relatively new teaching approach that has made it possible for college students to take courses as distance learning. With the emergence of the COVID-19 pandemic, however, TEL has become important for students in all grades who could not attend school during lockdown and whose schools offered TEL that forced students to learn without the accompanying advantage of attendance in a physical classroom. A number of issues surfaced as instructors mandated to use TEL attempted to do so. Many teachers had not used TEL before and were not technology-savvy, and TEL's impact on students' emotional, cognitive, and behavioral engagement, as well as on their grades, had not been previously assessed (Dunn & Kennedy, 2019). Although research on TEL exists, much of it has not emphasized the diversity of TEL solutions or the effects of TEL on student engagement (Dunn et al., 2019). Now that TEL is rapidly becoming important where lockdowns keep students out of bricks-and-mortar schools for lengthy periods of time, understanding what TEL is and how to teach in a TEL environment makes it necessary for instructors to learn TEL best practices, the best ways to engage students in the TEL environment, and how to assess students' work and provide feedback remotely.

Many educational and communication technologies can be incorporated into TEL. A key technology is the Internet of Things (IoT), which is the integration of physical devices with software, enabling the devices to connect with each other over the Internet to exchange information with each other and integrate directly into the physical world (Software Testing Help, 2020). Many of us already have these types of devices in our homes. If you have a smart refrigerator, smart watch,

smart fire alarm, smart door lock, smart bicycle, any kind of medical sensors, fitness trackers, or a smart security system, you have established an IoT in your home (Software Testing Help, 2020). IoT devices are proliferating rapidly, and it is expected that there will be 20 billion IoT products by 2021. Many people purchase these devices for home use to facilitate using technology or monitoring atmospheric factors such as temperature. The Google voice home controller, Amazon Echo, and the Flow air pollution monitor are IoT devices that are already popular (Software Testing Help, 2020). Depending upon the types of studies a student is pursuing, many of these could be leveraged to augment regular classroom studies by collecting data for analysis. Of course, computers, tablet devices, and similar devices connected to the Internet are central for students, because they can do more than access data on each other—they can

access documents, journals, videos, images, and a wide variety of information on a global scale. According to Kuppusamy (2019), "IoT continues to revolutionize e-Learning and is expected to bring in more 'connectedness' and smart classrooms in the future" (p. 386).

Another new educational concept that relates to IoT is Big Data. Big Data learning brings together both structured and unstructured data in a single data repository to provide the ability to conduct data searches of all types of data, including text, image, video, audio, posts, and more (Kuppusamy, 2019). In the educational context, the Big Data learning system captures multiple types of data related to the subject under study, including both structured and unstructured data (Kuppusamy, 2019). Combined with IoT, Big Data can be explored for hidden information and data connections through the use of data mining algorithms (Kuppusamy, 2019). The opportunities for IoT and Big Data to enhance access to data in the TEL environment are clear, because TEL is enhancement of learning through technology, and IoT and Big Data both provide the data through technology.

Successful TEL is not just dependent upon access to data, however. Since students in a TEL environment may be learning from home, outside a classroom environment, student engagement is key to the success of this style of learning. Many types of student engagement techniques used in traditional classrooms can also be used in the TEL remote classroom. Active learning, for example, uses instructional activities in which students do things and think about what they are doing; they encounter new information, engage with it, and reflect on what they have learned (Columbia CTL, n.d.). A virtual classroom is simply a classroom in which learning takes place in an online setting. Students can do many of the same things they can do in person, such as communicate, interact with learning resources, and even work in groups. Peer instruction can also occur in this setting. The flipped classroom is highly adaptive to the virtual learning environment, because it replaces lectures with self-paced tutorials, video, and multimedia, allowing students to experience the material at a personal level (Howles, 2015). The classroom time is then used for more in-depth learning activities and interaction with teacher and peers (Howles, 2015). Lectures are replaced by shifting the content to other types of delivery; for example, self-study pre-work can be designed to incorporate text, images, audio, video, and electronic quizzing that provides immediate feedback, while live virtual class time can be devoted to helping learners apply pre-work concepts, look at completed examples, and take part in discussions via chats (Howles, 2015). Field trips can be incorporated into the TEL environment to allow students to experience real-world examples of what they have learned. Many field trips today to local museums can allow people to visit alone, in a group, or virtually. Student-choice individual projects are especially motivating for most students, because allowing students to choose topics and projects that already interest them promotes engagement and follow-through. Lecture recordings are often used in the online learning environment where learning takes place non-synchronously; that is, teachers and students are not online at the same time, but the teacher posts a video and students watch it at their convenience. Mobile learning allows students to access the virtual classroom from mobile devices such as smartphones, laptops, and tablets.

E-assessments are a good fit for the TEL environment and provide advantages such as immediate focused feedback on student work, multiple attempts at an answer, links to further reading or resources, increasing students' digital literacy and engagement, preserve detailed student learning analytics for the teacher to analyze, and reduce the teacher's workload (TEAME, n.d.).

Teachers' assessment of student learning is more challenging in the asynchronous environment that most TEL is being conducted in during the coronavirus pandemic. Unlike a regular bricks-and-mortar classroom, an online class usually does not meet synchronously, where the teacher and students are all present simultaneously. This means that a teacher's usual casual assessments informed by watching students' reactions, asking questions, and asking for a show of hands are not possible. When grading students' papers, teachers must attempt to bridge the digital divide and make their assessments meaningful and helpful, which is difficult.

II. Materials and Method

A. Theory

A key theory related to TEL is disruptive innovation (Flavin & Quintero, 2018). Disruptive innovation was first named in the Harvard Business Review in 1995 as a precursor for "the emergence of new practices from the ground up" (Flavin et al., 2018, p. 2). Disruptive innovation defines new uses for existing technologies, enabling us to do what we had already been doing, but better, and generating new practices in the process (Flavin et al., 2018). Thus, disruptive innovation products can enable us to do more with less (Flavin et al., 2018). Google is one example of such an innovation; it is not only convenient and easy to use, but also free (Flavin et al., 2018). As Google has grown, it has brought with its new uses developed by its users, along with niche products and services such as specialized academic searches and document storage (Flavin et al., 2018). Google has, over time, metamorphosed from a disruptive innovation to a sustaining innovation, which often happens (Flavin et al., 2018).

Scanlon and Conole (2018) note that Activity Theory as described by Vygotsky in 1978 and Engstrom in 1987 is also part of the theoretical perspective of TEL, particularly with respect to TEL's multidisciplinarity. Because there is a broad body of literature that can be used to support TEL, and the literature comes from many disciplines, Bayne (2014) contended that the term "technology-enhanced learning" was actually shorthand for what was actually "a complex and often problematic constellation of social, technological, and educational change"—an observation suggesting that TEL originates in the context of change in multiple sectors (Scanlon et al., 2018).

Zenios (n.d.) points out that both experiential and problem-based learning approaches strongly influenced TEL and that

TEL is strongly linked to situated learning theory. The experiential theory assumes that learning occurs as a result

of engagement with a community's practices and depends on participating in the community's events and activities (Zenios, n.d.). Relationships among community members are shaped by their shared practices, and their participation gradually becomes increasingly engaged and complex (Zenios, n.d.). When students obtain experiential learning, they can transform the experience into "knowledge, skills, values, and emotions" through a process of reflection, according to Kolb (1984) (Zenios, n.d., p. 7). The process includes the four steps of experiencing or practicing, reflection on the practice, developing understanding through the formation of abstract concepts, and beginning the cycle again by planning a new experiment (Zenios, n.d.). Problem-based learning is an adaptable approach based on problem-solving (Zenios, n.d.). It has been used in the teaching fields of business, education, mathematics, medicine, and others (Zenios, n.d.). The fact that problem-solving is needed in every facet of daily life, as well as the need for learning to go beyond the simple provision of knowledge has bolstered the use of problem-solving for teaching students how to apply knowledge and principles they have learned in school (Zenios, n.d.). Knowledge by itself, without an understanding of how to apply it in specific situations, can be difficult to use in everyday life.

Hadi and Valenzuela (2019) apply theory from the fields of social science, communications, and computer science to TEL to explain why when haptic feedback accompanies communication, it creates a sense of "social presence" that relieves the impression of a "cold technological exchange" (p. 1). Haptic feedback is any type of feedback that makes the experience of doing something via technology instead of in person seem more realistic, as though it were a real exchange instead of a virtual one (Loveridge, 2020). Haptic feedback makes an exchange feel more like it would feel in real life (Loveridge, 2020). This applied theory is often applied in the world of gaming, where details in the game experience can make the gamer feel he is actually in the world of the game (Loveridge, 2020). In gaming, haptic feedback changes the way players play the game, and when applied to TEL, it can accomplish the same thing (Loveridge, 2010). By making the game feel real, it elicits more authentic responses from players. The same can be said of TEL sessions that feel more real to the students. Any kind of technology or approach that enhances that feeling can increase the students' learning and engagement in the TEL class.

As these examples demonstrate, when theory is applied to TEL, it has the potential to change not only the outcome of the technology's development but also the experience of the students who are taught using it. The prospect of TEL's evolving into disruptive innovation may lead to its use in a variety of new settings, benefiting the TEL industry as well as the research behind it. In the context of education, enhancing TEL so that it becomes a disruptive innovation will not only bring it into wider use but will also change the educational paradigm overall, as lessons learned from TEL are applied to regular classroom learning. The development of niche products and services related to TEL is also likely to increase and to shape TEL going forward. The fact that TEL supports multidisciplinary will almost certainly expand its uses, which in turn will add new dimensions to TEL and identify new potential areas where it can develop further. TEL is already being used for learning related to diverse subject matter, ranging from coaching to medical education. The fact that TEL is a natural choice for experiential and problem-based learning suggests that it will probably develop more fully in those areas, because they are compatible with the TEL technology. The introduction of social presence into TEL by means of adding haptic feedback will be the most technologically complex strategy for enhancing TEL, but it could make a strategic difference in the way students experience the technology. A student in a regular online course without haptic feedback is not going have the sensation of "being there" in an online class the way he would if haptic feedback made the experience more realistic and relatable. Although this may seem like a minor issue, in reality incorporating haptic feedback that increases the realism of the experience could have a significant beneficial impact on students. Just like virtual reality improved the online gaming experience for gamers, haptic feedback could improve the online learning experience for TEL students. It could diminish the effects of asynchronous learning and give the students the sensation closer to being present in the class the way they are in a conventional bricks-and-mortar classroom. We could expect this to increase students' attention, interest, and ability to focus on and understand the material. Ultimately, the more we can make the experience of learning via TEL equivalent to a classroom context in which the teacher and the other students are present, the more likely the students will remain engaged..

B. Literature Review

In Dunn et al.'s (2019) TEL study, the purpose was to determine the impact of students' emotional, cognitive, and behavioral engagement with TEL on their grades and to see how their levels of motivation predicted their engagement with different kinds of TEL. A sample of 524 undergraduate students was used, and the researchers measured both the engagement and usage of TEL, motivation of students, and students' self-reported grades (Dunn et al., 2019). The study results showed that student engagement could be predicted by intrinsic motivations and that TEL usage could be predicted by grades (Dunn et al., 2019). When TEL was broken down by type, grades were significantly predicted by student engagement, while the use of social media groups predicted grades (Dunn et al., 2019). Other factors tested included review of lecture slides or recordings, reading further content, and using course blogs or discussion boards, none of which were predictive of grades (Dunn et al., 2019). Based on the results of the research, Dunn et al. (2019) concluded that focusing only on TEL usage was misleading.

Daniel et al. (2018) conducted a multidimensional study aimed at determining how TEL can enhance teaching and learning and convert them to factors that promote sustainable socioeconomic growth and development. The researchers developed a multidimensional survey that was then distributed internationally to lecturers and professors actively serving in the field of higher education (Daniel et al., 2018). The study was based on the thesis frequently expressed in the literature that TEL provides substantial value added for enhancing the teaching and learning process (Daniel et al., 2018). The study found that in order for

technology used in learning to be beneficial rather than obstructive, several conditions

must be met (Daniel et al., 2018). The authors used a structured 24-question questionnaire for collecting opinions of 140 respondents worldwide, 29 of whom were students, 103 professors, 6 administrators, and 2 who had no formal connection with higher education (Daniel et al., 2018). The study found that much needs to be done to increase respondents' TEL-related competence and that its perceived value in education is only moderate (Daniel et al., 2018). TEL's potential in education is limited by availability of resources, low computer literacy regarding TEL, and certain psychological factors (Daniel et al., 2018). The researchers note that the Sustainable Education model incorporates human and technology factors in a balanced manner, with emphasis on the sharing of common perceptions and value models (Daniel et al., 2018). The primary issue requiring further study is the determination of which factors determine measurable sustainable goals in education in tandem with the other aspects of sustainability, such as the economy, society, and the environment (Daniel et al., 2018).

Scanlon et al. (2018) were commissioned to produce a study of the working practices of academics that use TEL. A dataset of interviews with 18 participants was conducted with TEL researchers as part of a Joint Research Councils' program examining the theme of interdisciplinarity in TEL (Scanlon et al., 2018). The results indicated that three strategies should be adopted to support interdisciplinarity in TEL: ensuring effective communication among team members, the project lead's ability respond sensitively to group dynamics and build "a culture of trust and shared enterprise," and engage in capacity-building to help individuals develop the skills needed to use interdisciplinary methods (Scanlon et al., 2018).

Flavin et al. (2018) conducted a qualitative study using content analysis that examined 44 publicly available UK university TEL strategies. The purpose of the study was to assess which institutional strategies accommodate innovation in TEL, and the extent to which they do so (Flavin et al., 2018). To facilitate the study, the researchers categorized the content into three categories of innovation—disruptive, sustaining, and efficiency—against which to evaluate individual institutional strategies (Flavin et al., 2018). The authors found that sustaining innovation and efficiency innovation are more commonly found strategies than disruptive innovation because the latter is not aligned well with students' and lecturers' technology practices (Flavin et al., 2018). Universities' willingness to adapt but lack of willingness to disrupt suggests that universities primarily just maintain existing innovation, creating a disconnect between the students—who use various disruptive technologies every day—and the universities, which tend to ignore disruptive technologies (Flavin et al., 2018). This is an issue that universities need to address to remain relevant to students.

Thanaraj and Williams (2016) used a case study approach to analyze the uptake of TEL at their universities and found that uptake has been limited due to the behaviors of academics, which have not been TEL-friendly and which influence student learning. The authors contend that universities need a TEL strategy intended to be sustainable and that transforms teaching (Thanaraj et al., 2016). The study methods had three components: contextual analysis aimed at defining the needs of academics in terms of their concerns and motivations for adopting TEL, a case study of the TEL practices and implementation of two higher education institutions, and the outcome involving recommendations and guidelines for sustaining and transforming TEL (Thanaraj et al., 2016). Six semi-structured interviews with institutional representatives were conducted, as well as one-hour focus groups and a content analysis (Thanaraj et al., 2016). The research identified key enablers, barriers, and institutional measures of TEL at the two universities. Enablers at both universities included student experience, identity and belonging, personalized learning, flexibility, creativity, and access to education through widening, participation, and diversity (Thanaraj et al., 2016). Barriers included insufficient digital literacy/fluency skills, lack of concrete evidence for pedagogy, extent of career recognition/progression, impact on time/resources/staff workload, lack of opportunity to share best practices, lack of knowledge concerning how it affects student learning, staff fear and hesitation, lack of posted support and tools, and the belief that it is not better simply because it is electronic (Thanaraj et al., 2016). Institutional measures included embedding TEL into learning/teaching/assessment with Q&A process, reflecting TEL involvement in staff workload, localizing use of TEL in schools and subjects, recognizing research on teaching as a scholarly activity, making the pedagogy fit the subject discipline, and investing in the software/people/training (Thanaraj et al., 2016). The authors posit that making a TEL initiative successful depends on how TEL affects teaching and learning rather than on the technology itself (Thanaraj et al., 2016). The goal of implementing TEL is to ensure it is used successfully and in a sustained fashion so that learning, teaching, and assessment across all the university's programs will be benefited, and to accomplish this, the authors stress the importance of looking beyond the technology to the pedagogical, cultural, and social factors involved (Thanaraj et al., 2016).

The methods used in this mixed methods study started with the development of a research question to focus the research on. Since the focus of the research is the use of TEL for learning, it was important to identify the strategies teachers use for each type of intended outcome of TEL.

The research question is: What strategies do teachers prefer for best practice, student engagement, and assessment and feedback in the TEL environment?

To obtain answers to this question, a survey was developed consisting of 10 multiple-choice questions followed by one open-ended question. The survey was intended to be conducted online so that as many qualified teachers could be included as possible. After requesting the respondent's gender and age, the survey addressed three major categories of questions: best practices (5 questions), student engagement (3 questions), and assessment and feedback (2 questions). Among the multiple-choice questions, some questions stipulated that the respondent

should check all responses that apply. This option provided the opportunity to identify all of the options that teachers were making use of rather than just one of the options. The distinction is meaningful, because if respondents use three different options but are only allowed to choose one of them as a response, the results do not reflect what teachers really do in practice. The general question invited respondents to identify any other insights and possible solutions they wished to share concerning TEL as a whole, best practices, student engagement, and assessment and feedback. The first 10 questions were analyzed quantitatively, while the general question offered qualitative insights.

The second step was to create the survey online on the SurveyMonkey web site, where respondents could access it anonymously and take the survey. SurveyMonkey is frequently used for studies of this type, and it is possible to obtain a larger and more varied sample in a shorter period of time than would likely be possible in a known setting where people had to receive and return the survey in hard copy. The process of creating a survey on SurveyMonkey starts with selecting "Create Survey" and then populating the blank survey with the questions. Once the questions were all entered, the survey was previewed and then sent out. A central collector was identified that the responses would be returned to. SurveyMonkey is a familiar, easy-to-use, platform on which to create, distribute, and collect results from surveys, and the process is streamlined to provide good results.

The third step was to collect and analyze the results from SurveyMonkey. This is a simple process that only involves and receiving and analyzing the completed survey results. The anonymity of respondents is preserved using this method, and once their surveys have been completed, their results are available immediately electronically. The data analysis plan was to analyze the results of the first 10 questions quantitatively using the SPSS software and math, while the 11th question results were analyzed qualitatively by tagging the categories evident in each response and the implications for TEL implementation. The quantitative analysis analyzed descriptive statistics in the quantitative data to determine the distribution of each multiple-choice answer among the sample of respondents. For example, the number and percentage of each of the multiple-choice responses for a question would be ranked in order of the number of each response that occurred, and what percentage each number represents. Then the responses were analyzed to provide the percentage of each answer by gender, then by age. This identified whether and how much there were gender-based or age-based preferences for the responses. Using the Crosstabs function, a crosstabulation was done to identify how gender and age predict which of the multiple-choice answers an individual is likely to choose in each category.

The fourth step was to analyze the open-ended 11th question results using qualitative data analysis. This is a five-step process that starts with reviewing the answers to the 11th question. The second step is to identify any repeating themes in the responses. These may be strategies, problems, or other types of information included in the answers. The third step is to tag each of these repeating themes with a code that permits searching and counting of the instances that occur. The fourth step is to analyze the codes so that they better represent the data gathered. This is done by merging similar codes to reduce complexity and breaking down codes that should really be separated into multiple codes. The fifth and final step is to identify the final set of themes that result from this process and how frequently each one occurs in the responses data. From this final set, insights from the data will be formulated to describe what was learned from the responses to the question and any reparative action that the insights suggest might be undertaken with respect to the use of TEL.

The fifth and final step was to identify what was learned from the survey results. At this point, the overall analysis of data from the quantitative and qualitative analyses can be compared and the insights from each juxtaposed to obtain a deeper understanding of both. For example, if the quantitative analysis indicates that the majority of respondents chose a certain multiple-choice answer in Question #1, it can be assumed that all or nearly all respondents view IoT from a similar perspective. However, if the responses to that question are roughly evenly distributed among all the possible responses, the indication is that there is no universally preferred view of IoT. If most respondents indicated that they did not know enough about IoT to use it in their teaching, this would demonstrate that IoT is being underused because teachers are not conversant with the technology and the ways it could be leveraged in the teaching context. If certain results are associated with people in a particular age range or gender, this information could be used to provide extra instruction or encouragement to teachers that fit that combination of age and gender. The results can spur a call to action for schools to educate, train, and equip teachers so that they will be ready to confidently and productively implement TEL in their own classrooms and teach students using the knowledge they have gained regarding TEL. When the results of the study are published, there will be another level of learning in that educators can read about the study and apply what was learned to their own teaching practice. Some teachers may even want to submit the survey questions to the colleagues in their own school to find out what the climate is for TEL in their educational system.

C. Analysis and Data

The data was collected over period from different universities and prominent colleges in Kuwait. The survey includes participation from Australian College of Kuwait (ACK), Gulf University of Science and Technology (GUST), American University of Kuwait (AUK), Arab Open University (AOU), Box Hill College Kuwait (BHCK), American Collage for Middle East (ACM), Kuwait Maastricht Business School (KMBS), Algonquin Collage Kuwait (AC) and the Public Authority for Applied Education and Training (PAEET).

The participants are from different age groups starting from 25 years to 75 years. All participants are working in education sector and have used online teaching in Kuwait during the pandemic. In the below graph, participation of different age groups from different universities of Kuwait

can be seen. It also differentiates between male and female participation in the research ***Figure 1.***
The survey included ten main questions, which were answered by all participants from different age groups and both genders. All questions were compulsory and the data was collected and analyzed based on the responses.

A. Question -1 When you use electronic devices such as computers, TVs, and IPads (referred to as IoT "the Internet of Things", what do you think of using it as a teacher? ***Table 1***

This question was an introductory question with sub parts asking participants about their gender, institution they work for, their age group and their opinion about using electronic devices, which is referred, as internet of things (IOT) as a teacher.

In response to this question, our data shows that participants were from nine different colleges and universities in Kuwait. The youngest participants were 25 years old and the oldest participants were 75 years of age. This also shows that the participants possess different experience, which will also reflect in the final research. One hundred participants completed the survey.
The female participants in most of the age groups selected that they are not fully trained to use internet of things in teaching. However, male participants mostly agreed that internet is important part of teaching nowadays. The male participants in age group 35 to 44 mentioned that they are not aware to use it effectively. The male participants in age group 44 to 54 mostly answered that they do not see any benefit in using it. Many participants mentioned that they prefer the conventional style of teaching; some also mentioned that online teaching is situational as it depends on learner need to work with it.

B. Question-2 which of the following best explains how you would use IoT if you had access to the technology and knew how to use it? ***Table 2***

This question was about how an individual can used IoT if they had access to technology and knew how to use it. Most of the female participants in age group 25 to 34 selected that IoT helps in creating connectivity between learners and educators. Some even selected that it is good to keep up with the latest ongoing trend in the market. Most of the male members in same age group selected that it supports student engagement, creates new ways of learning and helps in managing user data. In age group 25 to 44, female participants selected that IoT supports keeping up with the latest trends and males in the same age group selected that it supports collecting data automatically and supports keeping up with trends. In age group 45 to 54, female participants selected between various responses. These responses included; it helps in student's attendance, student's engagement, new ways of teaching and learning, maintaining test scores and finally count of use of devices for automated tasks.

The male participants mainly selected the responses which says that it helps in automatic data collection. In age group 55 to 64 female participants mostly selected responses such as it helps collecting data automatically, supports connectivity between users and helps in recording various data like test scores. However, the male participants mostly selected that IoT helps in collecting data automatically.

C. Question-3 What are some ways that Big Data is impacting education and improving teaching and learning? ***Table 3***

This question was about discussing how the big data is affecting educational sector and improving teaching and learning. Most of the female participants selected that it helps in identifying students at risk. The female participants were in age group starting 24 and until 54 years of age. These participants were from AUK, ACK and AUM. The response of the male members was different as compared to female participants. The age group 25 to 34 years selected that it enhances quality of feedback and it creates an experience for the users. These participants were mainly from ACK and AOU.

In age group 35 to 44, male participants mainly selected that it helps improving accuracy and speed of feedback and candidates selecting this were mainly form BHCK. In age group 45 to 54, male participants mainly selected that this adds to a common experience and participants were mainly from different collages like AC, ACK, ACM and GUST.

D. Question-4 Factors that can enhance TEL to enhance the best practice? ***Table 4***

This question was an important part of the questionnaire and facilitated the research. It asks the participants about any factor that enhances TEL and what can be a related best practice in future? The options to answer this question included availability of TEL support staff, feedback from students, support from senior management, availability and access to tool across the college, workshops for students and teachers, meeting student satisfaction and improving administration processes. We can see in table-2 that as many as 21 participants in the survey as a response selected the first factor availability and access to tools across the collages. The factor, which got maximum selection, was improving administrative process. At least 42 participants selected it and it was rank 8. The other factors, which received maximum votes, was getting support from senior management. The rank was six. Few other factors, which received prominent ranks in the survey, are about meeting student satisfaction and availability of TEL support staff. In total 25 participants selected these.

E. Question-5 what are the online learning platforms that are used at your institution? ***Table 5***

This part of the survey asked the participants to specify which online platform they are using at their institution. The participants who selected this were mostly from ACK, AC, AOU and AUK. Many male participants in the same age group suggested that their college and university also used LMS and Moodle. In the age group of 45 to 54, the most selected was count of teams and the least selected was zoom and google classroom.

In addition, none selected count of blackboard. In the age group of 55 to 64, the total participants including male and female were limited. They selected either teams or streams. In age group 55 and above, participants selected mainly Lockdown browser and teams. The third most selected option was Moodle and MY LMS.

*F. Question-6 Which of the following student engagement methods do you feel are most productive? **Table 6***

This part of the survey discussed student engagement. The options available in this category are active learning, virtual classrooms, peer instructions, flipped classroom, field trips, student choice individual projects, lecture recordings, mobile learnings, e-assessments and individual learning. In the age group 25 to 34, most of the participants selected lecture recordings.

The methods, which got the least selection in this age group was peer instruction, field trip and individual projects. In age group of 35 to 44 participants, the most selected category was the virtual classroom. Most females and males selected this category. In age group of 45 to 54, the most common and most selected category was recorded lecture. Most of the participants selecting this were from ACK, PAEET and AC. In age group of 55 and above, mostly active learning and e-assessments.

*G. Question-7 Are your students more engaged in the online learning by Collaborative learning or individual work**. Table 7***

This part of the survey included asking participants if their students were engaged in online learning. The options were between if their students like individual work or whether they prefer collaborative work. The results were interesting. In age group 25 to 34 years most of the participants selected individual work.

Most of the females and most of the males selected this category. Most of the participants in this category were from AUK and GUST. In age group 54 and above, most of the people selected individual work as

well. These participants were from ACM and ACK. In this category, if we look at the total 62% votes went for individual work and the rest for collaborative work. Only 38% selected collaborative work and the result is based on pupil's participation from all different universities and colleges

*H. Question-8 Do your students enjoy using technology in the classroom? **Table 8***

This part of the survey asked about if the participants enjoyed using technology in the classroom in any form. If we study the age group 25 to 34, we will see mostly male and female answered negatively, which means they did not enjoy using technology in classroom. In next age group, which was divided between 35 to 44 years, males and females both voted equal that they enjoyed technology and that they did not enjoyed technology. In the next age group, which is categorized as 45 to 54, most of the participants selected that they did not enjoy technology.

Most of the participant's selecting this category were females. In age group 54 and 64 most of the participants selected that they did not enjoy technology. Looking at the results of the 65 to 74 age group, participants mostly selected that using technology was fine. Over all when we compare all the age groups, we see that most of them voted for not being able to enjoy technology in their teaching. As much as 54% selected this option.

They mentioned that it can be due to lack of individual interest, can be technical issues on some occasions, personal perspective that some learners might find online exams difficult, lack of motivation, complexity of the process, family problems, individual choice of using traditional methods and less technology.

On the other hand, many of those respondents who said they are comfortable using online technology stated that note taking has become easier, easy access to information, easier to focus, independent learning, easy to stimulate, recorded lectures are always available to support learning, accessibility have increased and it also the future way of imparting education. These were the few reasons given by the rest of the respondents who selected that technology is supporting teaching.

*İ. Question-9 Providing personal feedback on students' work can be challenging in the TEL environment. Which of the following methods do you feel would be most effective? **Table 9***

Feedback is an important part of learning and giving feedback in online teaching can be another challenge for anyone using these types of platforms for teaching. The participants were given various options to select. These options were feedback can be given by educators through a video call, feedback given by an audio message, peer assessment to give feedback or it can be also be in form of written comments on the paper.

In the youngest age group of 25 to 34 years, the participants selected using a scoresheet returned with the paper. In the second age group which starts from 35 years of age to 44 years, both male and female selected that the teacher can give feedback by writing some comments on the assessment paper. In age group of 45 to 54 years, females mostly selected writing feedback or comments in the written assessment sheet. However, the male participants selected that teacher can also use audio to record and send their feedback. In age group of 55 to 64 years, participants mostly selected filling a scoresheet for feedback and returning it after the assessment.

*J. eQuestion-10 What is your greatest challenge in assessing student work in the TEL environment? **Table 10***

The last part of the survey enables the participants to share the greatest challenge they might have faced in assessing students work in the TEL environment. The options available

to these participants are computer knowledge, invigilation, seeing individual student work and individual mistakes in the work, technical issues, time limitation and ability to use online platforms. When this question feedback was received and analyzed, it was found that different universities and different age groups came up with different opinions.

In age group 44 to 54 years, the most common challenge can be related to technical issues. In age group 55 and above, the most common challenges are technical. So, most of the educators from different universities and colleges including male and female mostly selected technical issues.

The responses included suggestions such as, easier grading platforms, encouraging students to participate and take advantage of the online teaching, motivating students, cameras should be made compulsory, instructions should be clear for better understanding by the readers, visual method and live streaming should be promoted, using screencast technology to enhance the teaching experience, more freedom to the instructor, adopting live streaming and 3D virtual classroom to be added to further facilitate online teaching. These were based on individual participants own experience so far with online teaching and resource.

D. Figures

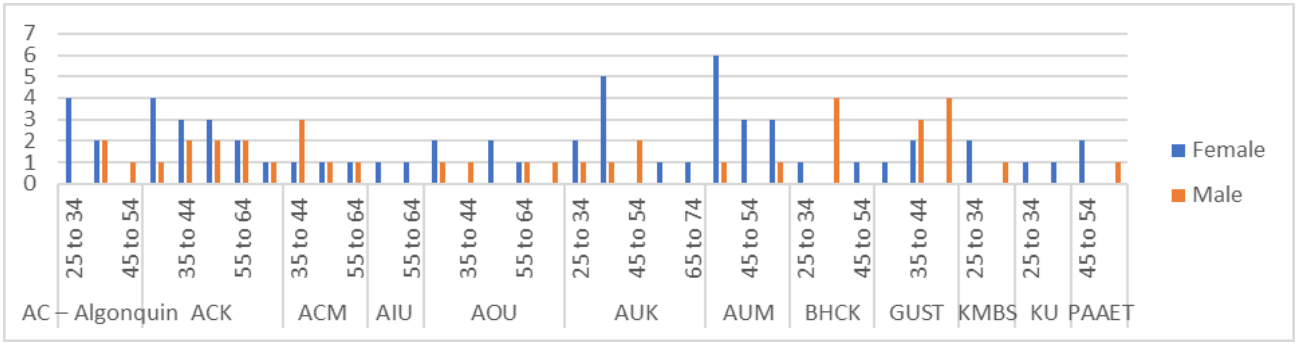

Fig. 1 Age group/education section and gender

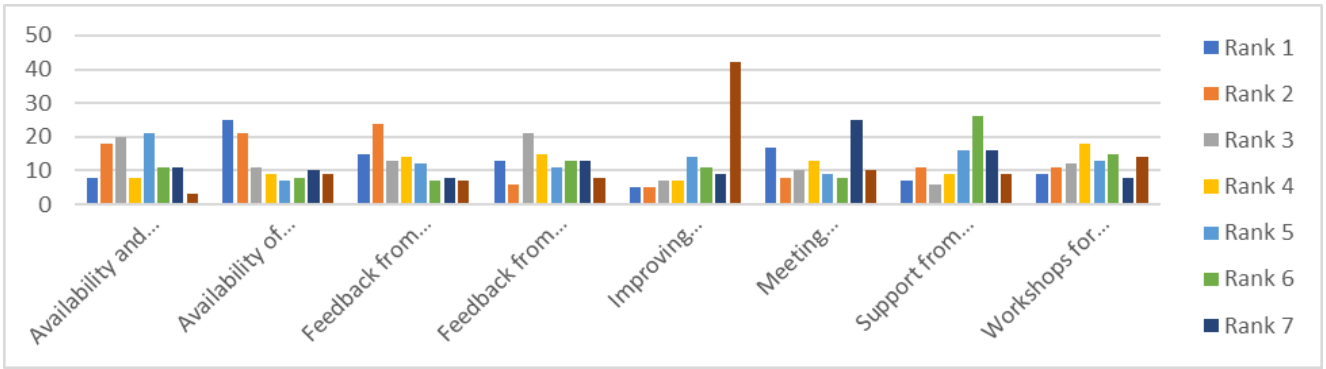

Fig. 2 Ranking of the Factors that enhance TEL

III. RESULTS

After analysing the data collected, we have come to following conclusions:

When it comes to IoT "The Internet of Thigs" most of the participants answered that they are not sure if they completely know or understand how to use IoT to facilitate their teaching. Most of the participants were females. Most participants selected "use of devices for automated purposes" only when they were asked in the research how they would use IoT if they knew how to use it completely. Another finding was that the big data is affecting the educational sector about online teaching by creating a common use experience for everyone who is part of this process. Improving administrative process will definitely help the process of Technology Enhanced Learning (TEL). The research also highlighted the fact that availability of TEL support staff, support from senior management and meeting pupil expectations is also important. Another finding was about the most popular and common platforms for online teaching. It was found that the three most used TEL platforms in Kuwait are MS Teams, Streams and MY LMS in order of the research analysis been done. Recording lectures was found to be the most used and agreed as most productive method of online teaching. Virtual classrooms and e-assessments followed this method. It was also found that most educators using online technology feel that their students are more comfortable and productive when they work individually. This is another important aspect which came up during the research. Teachers providing feedback to individual students by written comments on the paper was selected as one of the most common and popular methods among educators. Computer knowledge and using online platforms were marked as the biggest challenge in assessing students work.

IV. DISCUSSION / RECOMMENDATIONS

To popularize IoT in the educational sector. To create awareness about it in the educational sector and among educators. To ensure that educators can use it with ease, and they understand it's important that it's not only introduced as an only teaching option in pandemic however it's a part of GIG economy. This transformation of educational to a digital platform was much needed.

The awareness about social media can be done at an intuitional level or at a community level. Social media can also be used here to create an influence in the society. TEL should be promoted also in a way that it facilitates the conventional teaching method. Many tasks, which were done manually, can be done automatically. This will be less time consuming and support the educators in administrative and other tasks. Big data or the digitalization should be seen as an opportunity to innovate traditional teaching methods and use those users who previously in conventional or traditional teaching could not come to a collage or any educational place. TEL cannot be facilitated through software's or technology only. In order to get best results every institution or a group of institutions in Kuwait can have a support centre or a support team, which can answer and support any users who needs help. This will help in constructing a strong foundation for TEL in Kuwait. MY LMS, MS Teams and Streams are found to be the most popular platforms for TEL in Kuwait. Therefore, the support team must ensure that the educators are using the latest version of it.

A dedicated online team is needed not only for trouble shooting as recommended above however also for maintaining relation with service providers and service seekers. This will ensure they receive all latest updates and changes about the software's.

Recorded lectures can support TEL. Educators should be given some administrative help to create and upload these lectures. A volunteer or an assistant can help an educator to focus on online teaching. Educators should agree on new virtual policies or procedures, which suits the TEL environment. The students should be allowed to choose between group work and individual work so that they can deliver best results.

TEL cannot be implemented forcibly otherwise, any institution or any educator will not be able to get effective or desired results. Our research recommends that each course (which may belong to different field or major) should not be forced to go through the same criteria. Some courses can easily implement TEL; however, some other courses can implement it partially. Therefore, the educator should be given freedom to redesign or modify the course according to the TEL criteria. This might need support from management, this might include some administrative support from a teaching assistant or some feedback or input from the student itself. A reasonable period to implement TEL will give better results and support the education process as a whole. To facilitate feedback process for the educators the users or the students should be aware about the complexity of the process and able to understand that it is time-consuming process. This might enable them to be motivated to appear on time for feedback and then understand the process of online feedback. Regular trainings for educators will also help in laying the foundation of TEL in education sector.

V. CONCLUSION

We strongly feel that TEL is the future. Our educational sector was waiting for a transformation and it was long due. The COVID-19 pandemic in 2020 has given a push to the educational sector like many other sectors to go for a paradigm shift. If we look at the history most of the changes which occurred and transformed the world were either compulsory or was the only option at that time. This TEL have appeared like a paradigm shift of the educational sector. The world was already taking about Artificial intelligence and GIG economy before the pandemic and the pandemic itself has given it a boost. Therefore, the gig economy will definitely have a place for digitalization of education and TEL. Therefore, this research is just in a foundation stage for more such research that can guide the use TEL and further enhance it uses in future.

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REFERENCES

[1] Columbia CTL. (n.d.). Active learning for your online classroom: five strategies using Zoom. https://ctl.columbia.edu/resources-and-technology/teaching-with-technology/teaching-online/active-learning/

[2] Daniel, L., Visvizi, A., Gutiérrez-Braojos, C., & Lytras, M. D. (2018). Sustainable higher education and technology-enhanced learning (TEL) Sustainability, 2018(10), 3883-3905. doi:10.3390/su10113883.

[3] Dunn, T. J., & Kennedy, M. (2019). Technology-enhanced learning in higher education: Motivations, engagement, and academic achievement. Computers & Education, 137,104-113. https://www.sciencedirect.com/science/article/abs/pii/S0360131519300831

[4] Flavin, M., & Quintero, V. (2018). UK higher education institutions' technology-enhanced learning strategies from the perspective of disruptive innovation. Research in Learning Technology, 26, 1-12. https://dx.doi.org/10.25304/rlt.v26.1987.

[5] Hadi, R., & Valenzuela, A. (2019). Good vibrations: Consumer responses to technology-mediated haptic feedback. Marketing Science Institute Working Paper Series 2019, Report No. 19-116. https://www.msi.org/wp-content/uploads/2020/06/MSI_Report_19-116-1.pdf

[6] Howles, D. (2015). Design tips for flipping the virtual classroom. Learning Solutions. https://learningsolutionsmag.com/articles/1721/design-tips-for-flipping-the-virtual-classroom

[7] Kuppusamy, P. (2019). Smart education using Internet of Things technology. In: Emerging Technologies and Applications in Data Processing and Management, 385-412. Hershey, PA: IGI Global. DOI: 10.4018/978-1-5225-8446-9.ch017

[8] Loveridge, S. (2020). What is haptic feedback and how will it change the way we play? Games Radar. https://www.gamesradar.com/haptic-feedback-explained/

[9] Scanlon, E., & Conole, G. (2018). Interdisciplinarity in technology-enhanced learning: An interview study. Journal of Interactive Media in Education, 2018(1), 11-19. http://oro.open.ac.uk/57252/1/ES%20JIME%202018.pdf

[10] Software Testing Help. (2020). 18 most popular IoT devices in 2020 (only noteworthy IoT products). https://www.softwaretestinghelp.com/iot-devices/

[11] TEAME. (n.d.). Benefits of e-assessment. http://www.teame.ie/benefits-of-e-assessment/#:~:text=E-assessment%20is%20a%20valuable%20tool%20in%20Higher%20Education,many%20advantages%20over%20traditional%20pen%20and%20paper%20exams.

[12] Thanaraj, A., & Williams, S. (2016). Supporting the adoption of technology-enhanced learning by academics at universities. Journal of Teaching and Learning with Technology, 5(1), 59-86. doi: 10.14434/jotlt.v5n1.18985

[13] Zenios, M. (n.d.). Educational theory in technology enhanced learning (TEL) revisited: A model for simulation-based learning in higher education. British Journal of Educational Studies. https://www.researchgate.net/profile/Maria_Zenios/publication/342170201_Title_Educational_theory_in_technology_enhanced_learning_TEL_revisited_a_model_for_simulation-based_learning_in_higher_education/links/5ef46c8a92851c35353fca9.

APPENDIXES

Table 1: When you use electronic devices such as computers, TVs, and IPads (referred to as IoT "the Internet of Things", what do you think of using it as a teacher?

	Education Institution												
Gender/Age	**AC**	**ACK**	**ACM**	**AIU**	**AOU**	**AUK**	**AUM**	**BHCK**	**GUST**	**KMBS**	**KU**	**PAAET**	**Grand Total**
25 to 34	4	5	0	1	3	3	7	1	1	2	1	0	28
Female	4	4	0	1	2	2	6	1	1	2	1	0	24
Do not feel I know enough about IoT to use it in my teaching	3	1	0	1	0	1	1	1	0	1	0	0	9
Do not have access to these types of devices	0	0	0	0	1	1	1	0	0	0	1	0	4
Do not know how to use it effectively	0	0	0	0	1	0	3	0	0	1	0	0	5
Do not see the added value in using it	1	2	0	0	0	0	1	0	0	0	0	0	4
Does not fit my teaching style	0	0	0	0	0	0	0	0	1	0	0	0	1
Other: It is a good way to enhance the teaching style	0	1	0	0	0	0	0	0	0	0	0	0	1
Male	0	1	0	0	1	1	1	0	0	0	0	0	4
Do not feel I know enough about IoT to use it in my teaching	0	0	0	0	1	0	0	0	0	0	0	0	1
Do not have access to these types of devices	0	0	0	0	0	0	1	0	0	0	0	0	1
Do not know how to use it effectively	0	0	0	0	0	1	0	0	0	0	0	0	1
Other: I think they are important	0	1	0	0	0	0	0	0	0	0	0	0	1
35 to 44	4	5	4	0	1	6	0	4	5	1	0	0	30
Female	2	3	1	0	0	5	0	0	2	0	0	0	13
Do not feel I know enough about IoT to use it in my teaching	2	0	0	0	0	3	0	0	0	0	0	0	5
Do not have access to these types of devices	0	1	0	0	0	1	0	0	1	0	0	0	3
Do not know how to use it effectively	0	1	0	0	0	0	0	0	0	0	0	0	1
Do not see the added value in using it	0	0	1	0	0	0	0	0	0	0	0	0	1
Does not fit my teaching style	0	0	0	0	0	1	0	0	1	0	0	0	2
Other: I use it	0	1	0	0	0	0	0	0	0	0	0	0	1
Male	2	2	3	0	1	1	0	4	3	1	0	0	17
Do not feel I know enough about IoT to use it in my teaching	1	0	0	0	0	0	0	0	1	1	0	0	3

Do not have access to these types of devices	0	0	0	0	0	0	0	2	1	0	0	0	3
Do not know how to use it effectively	0	0	2	0	1	0	0	2	1	0	0	0	6
Do not see the added value in using it	1	0	1	0	0	0	0	0	0	0	0	0	2
Does not fit my teaching style	0	0	0	0	0	1	0	0	0	0	0	0	1
Other: I like it but I prefer the conventional way of teaching	0	1	0	0	0	0	0	0	0	0	0	0	1
Other: I'm fine with it	0	1	0	0	0	0	0	0	0	0	0	0	1
45 to 54	1	5	2	0	2	2	3	1	4	0	0	2	22
Female	0	3	1	0	2	0	3	1	0	0	0	2	12
Do not feel I know enough about IoT to use it in my teaching	0	1	0	0	2	0	1	0	0	0	0	0	4
Do not see the added value in using it	0	1	1	0	0	0	2	1	0	0	0	2	7
Does not fit my teaching style	0	1	0	0	0	0	0	0	0	0	0	0	1
Male	1	2	1	0	0	2	0	0	4	0	0	0	10
Do not feel I know enough about IoT to use it in my teaching	0	0	1	0	0	0	0	0	0	0	0	0	1
Do not have access to these types of devices	0	0	0	0	0	0	0	0	2	0	0	0	2
Do not see the added value in using it	1	0	0	0	0	2	0	0	1	0	0	0	4
Does not fit my teaching style	0	0	0	0	0	0	0	0	1	0	0	0	1
Other: It is our main tools/devices to interact/communicate with students while delivering the knowledge	0	1	0	0	0	0	0	0	0	0	0	0	1
Other: It works well	0	1	0	0	0	0	0	0	0	0	0	0	1
55 to 64	0	4	2	1	2	1	4	0	0	0	0	1	15
Female	0	2	1	1	1	1	3	0	0	0	0	0	9
Do not feel I know enough about IoT to use it in my teaching	0	1	1	0	1	0	1	0	0	0	0	0	4
Do not have access to these types of devices	0	1	0	1	0	1	0	0	0	0	0	0	3
Do not know how to use it effectively	0	0	0	0	0	0	1	0	0	0	0	0	1
Do not see the added value in using it	0	0	0	0	0	0	1	0	0	0	0	0	1
Male	0	2	1	0	1	0	1	0	0	0	0	1	6
Do not have access to these types of devices	0	0	0	0	1	0	1	0	0	0	0	0	2
Do not see the added value in using it	0	0	1	0	0	0	0	0	0	0	0	1	2
Other: It aids teaching effectively	0	1	0	0	0	0	0	0	0	0	0	0	1

Other: The use of the device will be situational according to learner needs.	0	1	0	0	0	0	0	0	0	0	0	0	1
56 to 64	0	0	0	0	1	0	0	0	0	0	0	0	1
Male	0	0	0	0	1	0	0	0	0	0	0	0	1
Do not see the added value in using it	0	0	0	0	1	0	0	0	0	0	0	0	1
65 to 74	0	2	0	0	0	1	0	0	0	0	1	0	4
Female	0	1	0	0	0	1	0	0	0	0	1	0	3
Do not feel I know enough about IoT to use it in my teaching	0	0	0	0	0	0	0	0	0	0	1	0	1
Do not see the added value in using it	0	0	0	0	0	1	0	0	0	0	0	0	1
Other: No problem	0	1	0	0	0	0	0	0	0	0	0	0	1
Male	0	1	0	0	0	0	0	0	0	0	0	0	1
Other: It's good despite technical issues but lacks human interaction	0	1	0	0	0	0	0	0	0	0	0	0	1
Grand Total	**9**	**21**	**8**	**2**	**9**	**13**	**14**	**6**	**10**	**3**	**2**	**3**	**100**

Table 2: Which of the following best explains how you would use IoT if you had access to the technology and knew how to use it?

Age/Gender/College	Count of Monitoring students' attendance	Count of to collect data automatically	Count of Monitoring students' engagement	Count of Create new ways for students to learn	Count of Developing communication and connectivity among learners/teachers	Count of to watch for trends	Count of Managing and record various user data such as test scores	Count of Use of devices for automated tasks
25 to 34	6	14	11	10	16	12	15	11
Female	6	12	9	8	15	11	13	10
AC – Algonquin College Kuwait	0	3	1	0	2	3	3	2
ACK – Australian College of Kuwait	2	1	4	4	3	2	3	3
AIU – American International University	1	0	0	0	0	1	0	0
AOU – Arab Open University	0	1	0	1	1	1	2	0
AUK – American University of Kuwait	0	0	0	0	2	1	2	0
AUM – American University of the Middle East	1	4	3	2	4	1	1	1
BHCK - Box Hill College Kuwait	0	1	0	1	1	0	1	0
GUST – Gulf University for Science and Technology	1	0	0	0	0	1	0	1
KMBS – Kuwait Maastricht Business School	1	2	1	0	2	0	1	2
KU – Kuwait University	0	0	0	0	0	1	0	1
Male	0	2	2	2	1	1	2	1
ACK – Australian College of Kuwait	0	1	0	1	1	1	1	0
AOU – Arab Open University	0	0	1	0	0	0	1	0
AUK – American University of Kuwait	0	1	0	0	0	0	0	0
AUM – American University of the Middle East	0	0	1	1	0	0	0	1
35 to 44	6	13	7	10	8	12	11	9
Female	3	5	4	6	4	7	4	5
AC – Algonquin College Kuwait	0	1	0	0	0	1	0	1
ACK – Australian College of Kuwait	2	2	2	2	3	1	2	1
ACM - American College of the Middle East	0	0	0	0	0	1	1	0
AUK – American University of Kuwait	1	2	2	3	1	3	1	2
GUST – Gulf University for Science and Technology	0	0	0	1	0	1	0	1
Male	3	8	3	4	4	5	7	4

AC – Algonquin College Kuwait	0	1	0	0	0	1	1	2
ACK – Australian College of Kuwait	1	2	2	0	2	0	2	0
ACM - American College of the Middle East	0	0	0	2	0	2	2	0
AOU – Arab Open University	0	1	0	0	0	0	0	0
AUK – American University of Kuwait	1	1	0	0	0	0	0	1
BHCK - Box Hill College Kuwait	0	0	1	0	1	2	2	0
GUST – Gulf University for Science and Technology	1	2	0	1	0	0	0	0
KMBS – Kuwait Maastricht Business School	0	1	0	1	1	0	0	1
45 to 54	11	10	9	11	7	9	9	8
Female	6	4	6	6	5	5	6	7
ACK – Australian College of Kuwait	3	2	3	2	2	2	2	2
ACM - American College of the Middle East	0	1	0	0	0	1	1	0
AOU – Arab Open University	0	0	0	0	1	0	1	1
AUM – American University of the Middle East	1	0	2	2	0	0	0	3
BHCK - Box Hill College Kuwait	0	1	0	1	0	1	1	0
PAAET - The Public Authority for Applied Education and Training	2	0	1	1	2	1	1	1
Male	5	6	3	5	2	4	3	1
AC – Algonquin College Kuwait	0	0	0	0	0	1	0	0
ACK – Australian College of Kuwait	1	2	2	1	1	1	1	0
ACM - American College of the Middle East	0	1	0	0	1	0	1	1
AUK – American University of Kuwait	2	1	1	2	0	1	1	0
GUST – Gulf University for Science and Technology	2	2	0	2	0	1	0	0
55 to 64	5	9	9	5	7	4	8	6
Female	4	5	4	3	5	2	5	4
ACK – Australian College of Kuwait	2	1	1	2	2	1	1	2
ACM - American College of the Middle East	0	0	0	0	0	1	1	0
AIU – American International University	0	0	1	0	1	0	1	0
AOU – Arab Open University	0	1	0	1	0	0	1	0
AUK – American University of Kuwait	1	1	0	0	1	0	1	0
AUM – American University of the Middle East	1	2	2	0	1	0	0	2
Male	1	4	5	2	2	2	3	2

ACK – Australian College of Kuwait	0	2	2	1	1	1	2	0
ACM - American College of the Middle East	0	1	0	0	0	0	1	0
AOU – Arab Open University	0	0	1	1	0	0	0	0
AUM – American University of the Middle East	0	1	1	0	1	0	0	1
PAAET - The Public Authority for Applied Education and Training	1	0	1	0	0	1	0	1
56 to 64	0	0	0	0	0	0	0	0
Male	0	0	0	0	0	0	0	0
AOU – Arab Open University	0	0	0	0	0	0	0	0
65 to 74	2	3	3	2	1	3	2	2
Female	2	2	2	1	0	2	2	1
ACK – Australian College of Kuwait	1	0	1	1	0	1	1	0
AUK – American University of Kuwait	0	1	1	0	0	0	1	0
KU – Kuwait University	1	1	0	0	0	1	0	1
Male	0	1	1	1	1	1	0	1
ACK – Australian College of Kuwait	0	1	1	1	1	1	0	1
Grand Total	**30**	**49**	**39**	**38**	**39**	**40**	**45**	**36**

Table 3: What are some ways that Big Data is impacting education and improving teaching and learning?

Age/Gender/College	Count of Improving the speed and accuracy of feedback	Count of Improving teaching by using different platforms.	Count of Improving learning by identifying students at risk	Count of Providing privacy to both teacher and students.	Count of Helping to create a common use experience
25 to 34	6	2	8	2	9
Female	4	2	8	2	7
AC – Algonquin College Kuwait	0	0	2	0	0
ACK – Australian College of Kuwait	1	1	1	2	2
AIU – American International University	1	0	0	0	0
AOU – Arab Open University	0	0	0	0	0
AUK – American University of Kuwait	0	0	1	0	1
AUM – American University of the Middle East	0	0	2	0	2
BHCK - Box Hill College Kuwait	0	0	0	0	0
GUST – Gulf University for Science and Technology	0	0	1	0	0
KMBS – Kuwait Maastricht Business School	2	1	1	0	2
KU – Kuwait University	0	0	0	0	0
Male	2	0	0	0	2
ACK – Australian College of Kuwait	1	0	0	0	1
AOU – Arab Open University	1	0	0	0	1
AUK – American University of Kuwait	0	0	0	0	0
AUM – American University of the Middle East	0	0	0	0	0
35 to 44	10	7	7	0	6
Female	4	4	5	0	3
AC – Algonquin College Kuwait	1	2	0	0	0
ACK – Australian College of Kuwait	1	0	2	0	2
ACM - American College of the Middle East	0	1	0	0	0
AUK – American University of Kuwait	2	1	3	0	1
GUST – Gulf University for Science and Technology	0	0	0	0	0

Male	6	3	2	0	3
AC – Algonquin College Kuwait	1	1	0	0	0
ACK – Australian College of Kuwait	1	1	1	0	2
ACM - American College of the Middle East	0	0	0	0	0
AOU – Arab Open University	0	0	0	0	1
AUK – American University of Kuwait	0	1	0	0	0
BHCK - Box Hill College Kuwait	3	0	0	0	0
GUST – Gulf University for Science and Technology	1	0	0	0	0
KMBS – Kuwait Maastricht Business School	0	0	1	0	0
45 to 54	6	6	9	1	9
Female	3	4	6	1	5
ACK – Australian College of Kuwait	1	2	2	0	3
ACM - American College of the Middle East	0	0	0	0	0
AOU – Arab Open University	1	0	1	0	0
AUM – American University of the Middle East	0	1	1	0	0
BHCK - Box Hill College Kuwait	1	0	0	0	1
PAAET - The Public Authority for Applied Education and Training	0	1	2	1	1
Male	3	2	3	0	4
AC – Algonquin College Kuwait	0	0	1	0	1
ACK – Australian College of Kuwait	1	1	0	0	1
ACM - American College of the Middle East	0	1	0	0	1
AUK – American University of Kuwait	1	0	1	0	0
GUST – Gulf University for Science and Technology	1	0	1	0	1
55 to 64	5	2	5	0	9
Female	2	0	2	0	5
ACK – Australian College of Kuwait	0	0	1	0	1
ACM - American College of the Middle East	1	0	0	0	1
AIU – American International University	0	0	0	0	1
AOU – Arab Open University	1	0	0	0	1
AUK – American University of Kuwait	0	0	0	0	0
AUM – American University of the Middle East	0	0	1	0	1
Male	3	2	3	0	4

ACK – Australian College of Kuwait	2	1	2	0	2
ACM - American College of the Middle East	0	0	0	0	0
AOU – Arab Open University	0	0	0	0	1
AUM – American University of the Middle East	1	1	0	0	0
PAAET - The Public Authority for Applied Education and Training	0	0	1	0	1
56 to 64	0	0	0	0	0
Male	0	0	0	0	0
AOU – Arab Open University	0	0	0	0	0
65 to 74	0	0	1	0	3
Female	0	0	0	0	2
ACK – Australian College of Kuwait	0	0	0	0	1
AUK – American University of Kuwait	0	0	0	0	0
KU – Kuwait University	0	0	0	0	1
Male	0	0	1	0	1
ACK – Australian College of Kuwait	0	0	1	0	1
Grand Total	**27**	**17**	**30**	**3**	**36**

Table 4: Factors that can enhance TEL to enhance the best practice?

Factors	Rank 1	Rank 2	Rank 3	Rank 4	Rank 5	Rank 6	Rank 7	Rank 8
Availability and access to tools across the college	8	18	20	8	21	11	11	3
Availability of TEL support staff.	25	21	11	9	7	8	10	9
Feedback from students	15	24	13	14	12	7	8	7
Feedback from teachers	13	6	21	15	11	13	13	8
Improving administrative processes	5	5	7	7	14	11	9	42
Meeting student satisfaction	17	8	10	13	9	8	25	10
Support from senior management	7	11	6	9	16	26	16	9
Workshops for teachers and students	9	11	12	18	13	15	8	14
Grand Total	**99**	**104**	**100**	**93**	**103**	**99**	**100**	**102**

Table 5: What are the online learning platforms that are used at your institution?

Age/Gender/College	Count of Moodle / LMS	Count of Blackboard	Count of Lockdown browser	Count of Safe exam browser	Count of Zoom	Count of Teams	Count of Forms	Count of Stream	Count of Turnitin	Count of Google Classroom
25 to 34	17	0	16	3	4	22	3	20	10	0
Female	15	0	14	2	3	19	3	17	8	0
AC – Algonquin College Kuwait	2	0	2	0	0	3	0	3	3	0
ACK – Australian College of Kuwait	4	0	4	2	0	4	2	4	3	0
AIU – American International University	0	0	0	0	0	1	0	1	0	0
AOU – Arab Open University	0	0	1	0	0	2	0	2	1	0
AUK – American University of Kuwait	2	0	1	0	2	2	0	2	1	0
AUM – American University of the Middle East	4	0	4	0	0	3	0	1	0	0
BHCK - Box Hill College Kuwait	0	0	1	0	0	1	0	1	0	0
GUST – Gulf University for Science and Technology	1	0	0	0	1	1	1	1	0	0
KMBS – Kuwait Maastricht Business School	1	0	1	0	0	1	0	2	0	0
KU – Kuwait University	1	0	0	0	0	1	0	0	0	0
Male	2	0	2	1	1	3	0	3	2	0
ACK – Australian College of Kuwait	1	0	1	1	0	1	0	1	1	0
AOU – Arab Open University	0	0	1	0	0	0	0	1	1	0
AUK – American University of Kuwait	1	0	0	0	1	1	0	1	0	0
AUM – American University of the Middle East	0	0	0	0	0	1	0	0	0	0
35 to 44	18	1	11	3	11	19	6	20	10	3
Female	8	1	6	3	7	10	3	11	7	3
AC – Algonquin College Kuwait	1	0	1	0	0	1	0	2	1	0
ACK – Australian College of Kuwait	3	0	3	3	0	3	1	3	3	0
ACM - American College of the Middle East	0	0	0	0	0	0	0	0	0	0
AUK – American University of Kuwait	2	1	2	0	5	4	2	4	3	3
GUST – Gulf University for Science and Technology	2	0	0	0	2	2	0	2	0	0
Male	10	0	5	0	4	9	3	9	3	0

AC – Algonquin College Kuwait	0	0	0	0	0	0	0	1	0	0
ACK – Australian College of Kuwait	2	0	2	0	0	2	2	2	2	0
ACM - American College of the Middle East	2	0	0	0	0	2	0	2	0	0
AOU – Arab Open University	0	0	1	0	0	1	0	1	1	0
AUK – American University of Kuwait	1	0	0	0	1	1	0	0	0	0
BHCK - Box Hill College Kuwait	1	0	0	0	0	2	1	2	0	0
GUST – Gulf University for Science and Technology	3	0	2	0	3	0	0	0	0	0
KMBS – Kuwait Maastricht Business School	1	0	0	0	0	1	0	1	0	0
45 to 54	13	1	11	0	6	17	7	11	6	1
Female	4	0	6	0	0	9	4	5	3	0
ACK – Australian College of Kuwait	3	0	3	0	0	3	3	3	2	0
ACM - American College of the Middle East	0	0	1	0	0	0	0	0	0	0
AOU – Arab Open University	0	0	0	0	0	1	1	2	1	0
AUM – American University of the Middle East	1	0	1	0	0	3	0	0	0	0
BHCK - Box Hill College Kuwait	0	0	1	0	0	0	0	0	0	0
PAAET - The Public Authority for Applied Education and Training	0	0	0	0	0	2	0	0	0	0
Male	9	1	5	0	6	8	3	6	3	1
AC – Algonquin College Kuwait	1	0	1	0	0	0	0	0	0	0
ACK – Australian College of Kuwait	2	0	2	0	0	2	2	2	2	0
ACM - American College of the Middle East	1	0	1	0	0	1	0	1	0	0
AUK – American University of Kuwait	1	1	1	0	2	2	0	2	1	1
GUST – Gulf University for Science and Technology	4	0	0	0	4	3	1	1	0	0
55 to 64	6	0	9	2	1	11	5	8	4	1
Female	4	0	6	0	1	6	4	5	2	1
ACK – Australian College of Kuwait	2	0	2	0	0	2	2	2	2	0
ACM - American College of the Middle East	0	0	0	0	0	1	1	1	0	0
AIU – American International University	0	0	0	0	0	1	0	1	0	0
AOU – Arab Open University	0	0	1	0	0	0	0	0	0	0
AUK – American University of Kuwait	1	0	1	0	1	1	1	1	0	1
AUM – American University of the Middle East	1	0	2	0	0	1	0	0	0	0

Male	2	0	3	2	0	5	1	3	2	0
ACK – Australian College of Kuwait	2	0	2	2	0	2	0	2	2	0
ACM - American College of the Middle East	0	0	0	0	0	0	0	0	0	0
AOU – Arab Open University	0	0	0	0	0	1	1	1	0	0
AUM – American University of the Middle East	0	0	1	0	0	1	0	0	0	0
PAAET - The Public Authority for Applied Education and Training	0	0	0	0	0	1	0	0	0	0
56 to 64	0	0	0	0	0	1	0	1	0	0
Male	0	0	0	0	0	1	0	1	0	0
AOU – Arab Open University	0	0	0	0	0	1	0	1	0	0
65 to 74	3	0	2	2	1	4	1	3	3	0
Female	2	0	1	1	1	3	1	2	2	0
ACK – Australian College of Kuwait	1	0	1	1	0	1	0	1	1	0
AUK – American University of Kuwait	0	0	0	0	1	1	1	1	1	0
KU – Kuwait University	1	0	0	0	0	1	0	0	0	0
Male	1	0	1	1	0	1	0	1	1	0
ACK – Australian College of Kuwait	1	0	1	1	0	1	0	1	1	0
Grand Total	**57**	**2**	**49**	**10**	**23**	**74**	**22**	**63**	**33**	**5**

Table 6: Which of the following student engagement methods do you feel are most productive?

Age/Gender/College	Count of Active learning	Count of Virtual classroom		Count of Peer instruction	Count of Flipped classroom	Count of Field trips	Count of Student-choice individual projects	Count of Lecture recording	Count of Mobile learning	Count of E-assessment	Count of No as effective a in person learning
25 to 34	8	11	1	7	1	2	14	1	11		
Female	7	8	1	5	1	1	12		10		
AC – Algonquin College Kuwait		2					1		1		
ACK – Australian College of Kuwait	2			4			4		4		
AIU – American International University							1		1		
AOU – Arab Open University	2				1		1				
AUK – American University of Kuwait		1	1				1		1		
AUM – American University of the Middle East	2	3		1		1	1				
BHCK - Box Hill College Kuwait							1		1		
GUST – Gulf University for Science and Technology		1					1		1		
KMBS – Kuwait Maastricht Business School	1	1							1		
KU – Kuwait University							1				
Male	1	3		2		1	2	1	1		
ACK – Australian College of Kuwait		1		1		1	1		1		
AOU – Arab Open University		1					1				
AUK – American University of Kuwait		1		1				1			
AUM – American University of the Middle East	1										
35 to 44	11	17	2	5	2	1	10	2	9		
Female	4	7	2	3			5	1	5		
AC – Algonquin College Kuwait											
ACK – Australian College of Kuwait	2	1		3			3		3		
ACM - American College of the Middle East		1									
AUK – American University of Kuwait		4	2				2		2		

GUST – Gulf University for Science and Technology	2	1						1		
Male	7	10		2	2	1	5	1	4	
AC – Algonquin College Kuwait	2					1				
ACK – Australian College of Kuwait	1	2		2	1		2		2	
ACM - American College of the Middle East	2	2					2		1	
AOU – Arab Open University	1				1					
AUK – American University of Kuwait		1						1	1	
BHCK - Box Hill College Kuwait		3					1			
GUST – Gulf University for Science and Technology	1	1								
KMBS – Kuwait Maastricht Business School		1								
45 to 54	6	6	1	5	2	2	11		10	1
Female	4	4		3	1	2	6		5	
ACK – Australian College of Kuwait		1		3			3		3	
ACM - American College of the Middle East	1									
AOU – Arab Open University	2						1		1	
AUM – American University of the Middle East	1	2				2				
BHCK - Box Hill College Kuwait		1			1					
PAAET - The Public Authority for Applied Education and Training							2		1	
Male	2	2	1	2	1		5		5	1
AC – Algonquin College Kuwait									1	
ACK – Australian College of Kuwait				2			2		2	1
ACM - American College of the Middle East	1						1			
AUK – American University of Kuwait		1	1				1		1	
GUST – Gulf University for Science and Technology	1	1			1		1		1	
55 to 64	10	4	1	4	1	1	5		5	
Female	5	3	1	2		1	2		3	
ACK – Australian College of Kuwait	2			2			2		2	
ACM - American College of the Middle East	1	1								

AIU – American International University										
AOU – Arab Open University		1								
AUK – American University of Kuwait			1						1	
AUM – American University of the Middle East	2	1				1				
Male	5	1		2	1		3		2	
ACK – Australian College of Kuwait	2	1		2			2		2	
ACM - American College of the Middle East	1									
AOU – Arab Open University	1				1					
AUM – American University of the Middle East	1									
PAAET - The Public Authority for Applied Education and Training							1			
56 to 64	1						1			
Male	1						1			
AOU – Arab Open University	1						1			
65 to 74	2	2	1	2			3	1	4	
Female	1	1	1	1			2		3	
ACK – Australian College of Kuwait	1			1			1		1	
AUK – American University of Kuwait		1	1						1	
KU – Kuwait University							1		1	
Male	1	1		1			1	1	1	
ACK – Australian College of Kuwait	1	1		1			1	1	1	
Grand Total	**38**	**40**	**6**	**23**	**6**	**6**	**44**	**4**	**39**	**1**

Table 7: Are your students more engaged in the online learning by:

Age/Gender/College	Count of Collaborative learning	Count of Individual work
25 to 34	9	19
Female	8	16
AC – Algonquin College Kuwait	4	
ACK – Australian College of Kuwait		4
AIU – American International University		1
AOU – Arab Open University		2
AUK – American University of Kuwait		2

AUM – American University of the Middle East	3	3
BHCK - Box Hill College Kuwait		1
GUST – Gulf University for Science and Technology		1
KMBS – Kuwait Maastricht Business School	1	1
KU – Kuwait University		1
Male	1	3
ACK – Australian College of Kuwait		1
AOU – Arab Open University		1
AUK – American University of Kuwait		1
AUM – American University of the Middle East	1	
35 to 44	12	18
Female	3	10
AC – Algonquin College Kuwait	1	1
ACK – Australian College of Kuwait		3
ACM - American College of the Middle East	1	
AUK – American University of Kuwait	1	4
GUST – Gulf University for Science and Technology		2
Male	9	8
AC – Algonquin College Kuwait	2	
ACK – Australian College of Kuwait	2	
ACM - American College of the Middle East	1	2
AOU – Arab Open University		1
AUK – American University of Kuwait		1
BHCK - Box Hill College Kuwait	4	
GUST – Gulf University for Science and Technology		3
KMBS – Kuwait Maastricht Business School		1
45 to 54	8	14
Female	2	10
ACK – Australian College of Kuwait		3
ACM - American College of the Middle East		1
AOU – Arab Open University		2
AUM – American University of the Middle East	2	1

BHCK - Box Hill College Kuwait		1
PAAET - The Public Authority for Applied Education and Training		2
Male	6	4
AC – Algonquin College Kuwait	1	
ACK – Australian College of Kuwait	1	1
ACM - American College of the Middle East	1	
AUK – American University of Kuwait	1	1
GUST – Gulf University for Science and Technology	2	2
55 to 64	7	8
Female	2	7
ACK – Australian College of Kuwait		2
ACM - American College of the Middle East		1
AIU – American International University		1
AOU – Arab Open University		1
AUK – American University of Kuwait		1
AUM – American University of the Middle East	2	1
Male	5	1
ACK – Australian College of Kuwait	2	
ACM - American College of the Middle East	1	
AOU – Arab Open University	1	
AUM – American University of the Middle East	1	
PAAET - The Public Authority for Applied Education and Training		1
56 to 64	1	
Male	1	
AOU – Arab Open University	1	
65 to 74	1	3
Female		3
ACK – Australian College of Kuwait		1
AUK – American University of Kuwait		1
KU – Kuwait University		1
Male	1	
ACK – Australian College of Kuwait	1	

Grand Total	**38**	**62**

Table 8: Do your students enjoy using technology in the classroom?

Age/Gender/College	Count of Yes	Count of No
25 to 34	11	17
Female	10	14
AC – Algonquin College Kuwait	2	2
ACK – Australian College of Kuwait	3	1
AIU – American International University		1
AOU – Arab Open University		2
AUK – American University of Kuwait	2	
AUM – American University of the Middle East	1	5
BHCK - Box Hill College Kuwait	1	
GUST – Gulf University for Science and Technology	1	
KMBS – Kuwait Maastricht Business School		2
KU – Kuwait University		1
Male	1	3
ACK – Australian College of Kuwait	1	
AOU – Arab Open University		1
AUK – American University of Kuwait		1
AUM – American University of the Middle East		1
35 to 44	15	15
Female	9	4
AC – Algonquin College Kuwait		2
ACK – Australian College of Kuwait	3	
ACM - American College of the Middle East		1
AUK – American University of Kuwait	4	1
GUST – Gulf University for Science and Technology	2	
Male	6	11
AC – Algonquin College Kuwait		2
ACK – Australian College of Kuwait	2	
ACM - American College of the Middle East	2	1
AOU – Arab Open University		1

AUK – American University of Kuwait		1
BHCK - Box Hill College Kuwait	2	2
GUST – Gulf University for Science and Technology		3
KMBS – Kuwait Maastricht Business School		1
45 to 54	10	12
Female	2	10
ACK – Australian College of Kuwait	2	1
ACM - American College of the Middle East		1
AOU – Arab Open University		2
AUM – American University of the Middle East		3
BHCK - Box Hill College Kuwait		1
PAAET - The Public Authority for Applied Education and Training		2
Male	8	2
AC – Algonquin College Kuwait		1
ACK – Australian College of Kuwait	2	
ACM - American College of the Middle East	1	
AUK – American University of Kuwait	2	
GUST – Gulf University for Science and Technology	3	1
55 to 64	7	8
Female	5	4
ACK – Australian College of Kuwait	2	
ACM - American College of the Middle East	1	
AIU – American International University		1
AOU – Arab Open University		1
AUK – American University of Kuwait	1	
AUM – American University of the Middle East	1	2
Male	2	4
ACK – Australian College of Kuwait	2	
ACM - American College of the Middle East		1
AOU – Arab Open University		1
AUM – American University of the Middle East		1
PAAET - The Public Authority for Applied Education and Training		1

56 to 64		1
Male		1
AOU – Arab Open University		1
65 to 74	3	1
Female	2	1
ACK – Australian College of Kuwait	1	
AUK – American University of Kuwait	1	
KU – Kuwait University		1
Male	1	
ACK – Australian College of Kuwait	1	
Grand Total	**46**	**54**

Table 9: Providing personal feedback on students' work can be challenging in the TEL environment. Which of the following methods do you feel would be most effective?

Age/Gender	AC	ACK	ACM	AIU	AOU	AUK	AUM	BHCK	GUST	KMBS	KU	PAAET	Grand Total
25 to 34	4	5	0	1	3	3	7	1	1	2	1	0	28
Female	4	4	0	1	2	2	6	1	1	2	1	0	24
A completed scoresheet returned with the paper	0	0	0	0	0	0	4	0	0	0	0	0	4
Peer assessment to give feedback	1	0	0	0	0	0	0	0	0	0	0	0	1
Teacher providing feedback to each student individually by recording audio	0	0	0	0	0	1	0	0	1	2	0	0	4
Teacher providing feedback to each student individually by video	0	2	0	0	1	1	0	0	0	0	0	0	4
Written comments on the paper	3	2	0	1	1	0	2	1	0	0	1	0	11
Male	0	1	0	0	1	1	1	0	0	0	0	0	4
A completed scoresheet returned with the paper	0	0	0	0	0	0	1	0	0	0	0	0	1
Teacher providing feedback to each student individually by recording audio	0	0	0	0	0	1	0	0	0	0	0	0	1
Teacher providing feedback to each student individually by video	0	0	0	0	1	0	0	0	0	0	0	0	1
Written comments on the paper	0	1	0	0	0	0	0	0	0	0	0	0	1
35 to 44	4	5	4	0	1	6	0	4	5	1	0	0	30
Female	2	3	1	0	0	5	0	0	2	0	0	0	13
A completed scoresheet returned with the paper	0	0	1	0	0	0	0	0	0	0	0	0	1
Peer assessment to give feedback	1	0	0	0	0	0	0	0	0	0	0	0	1
Teacher providing feedback to each student individually by recording audio	0	1	0	0	0	1	0	0	0	0	0	0	2
Teacher providing feedback to each student individually by video	1	2	0	0	0	1	0	0	2	0	0	0	6
Written comments on the paper	0	0	0	0	0	3	0	0	0	0	0	0	3
Male	2	2	3	0	1	1	0	4	3	1	0	0	17
Other: Feedback is provided via various methods - feedback on the document, scoresheet completed, and verbal feedback to individual student.	0	1	0	0	0	0	0	0	0	0	0	0	1
Other: group feedback online without mentioning names	0	1	0	0	0	0	0	0	0	0	0	0	1
Peer assessment to give feedback	2	0	0	0	0	0	0	0	0	0	0	0	2

Teacher providing feedback to each student individually by recording audio	0	0	0	0	0	1	0	0	2	1	0	0	4
Teacher providing feedback to each student individually by video	0	0	1	0	0	0	0	3	1	0	0	0	5
Written comments on the paper	0	0	2	0	1	0	0	1	0	0	0	0	4
45 to 54	1	5	2	0	2	2	3	1	4	0	0	2	22
Female	0	3	1	0	2	0	3	1	0	0	0	2	12
A completed scoresheet returned with the paper	0	0	0	0	0	0	2	0	0	0	0	0	2
Peer assessment to give feedback	0	0	0	0	0	0	1	0	0	0	0	0	1
Teacher providing feedback to each student individually by recording audio	0	0	0	0	1	0	0	1	0	0	0	0	2
Teacher providing feedback to each student individually by video	0	2	0	0	0	0	0	0	0	0	0	0	2
Written comments on the paper	0	1	1	0	1	0	0	0	0	0	0	2	5
Male	1	2	1	0	0	2	0	0	4	0	0	0	10
A completed scoresheet returned with the paper	0	1	0	0	0	0	0	0	0	0	0	0	1
Other: Written feedback by email or Turnitin	0	1	0	0	0	0	0	0	0	0	0	0	1
Teacher providing feedback to each student individually by recording audio	1	0	1	0	0	0	0	0	2	0	0	0	4
Teacher providing feedback to each student individually by video	0	0	0	0	0	0	0	0	2	0	0	0	2
Written comments on the paper	0	0	0	0	0	2	0	0	0	0	0	0	2
55 to 64	0	4	2	1	2	1	4	0	0	0	0	1	15
Female	0	2	1	1	1	1	3	0	0	0	0	0	9
A completed scoresheet returned with the paper	0	0	0	0	0	0	3	0	0	0	0	0	3
Teacher providing feedback to each student individually by recording audio	0	0	1	0	1	0	0	0	0	0	0	0	2
Teacher providing feedback to each student individually by video	0	1	0	1	0	0	0	0	0	0	0	0	2
Written comments on the paper	0	1	0	0	0	1	0	0	0	0	0	0	2
Male	0	2	1	0	1	0	1	0	0	0	0	1	6
Peer assessment to give feedback	0	1	0	0	0	0	0	0	0	0	0	0	1
Teacher providing feedback to each student individually by recording audio	0	1	0	0	0	0	0	0	0	0	0	0	1
Teacher providing feedback to each student individually by video	0	0	1	0	0	0	1	0	0	0	0	0	2
Written comments on the paper	0	0	0	0	1	0	0	0	0	0	0	1	2

56 to 64	0	0	0	0	1	0	0	0	0	0	0	0	1
Male	0	0	0	0	1	0	0	0	0	0	0	0	1
Teacher providing feedback to each student individually by video	0	0	0	0	1	0	0	0	0	0	0	0	1
65 to 74	0	2	0	0	0	1	0	0	0	0	1	0	4
Female	0	1	0	0	0	1	0	0	0	0	1	0	3
Teacher providing feedback to each student individually by recording audio	0	1	0	0	0	0	0	0	0	0	0	0	1
Written comments on the paper	0	0	0	0	0	1	0	0	0	0	1	0	2
Male	0	1	0	0	0	0	0	0	0	0	0	0	1
Teacher providing feedback to each student individually by recording audio	0	1	0	0	0	0	0	0	0	0	0	0	1
Grand Total	**9**	**21**	**8**	**2**	**9**	**13**	**14**	**6**	**10**	**3**	**2**	**3**	**100**

Table 10: What is your greatest challenge in assessing student work in the TEL environment?

Age/Gender	AC	ACK	ACM	AIU	AOU	AUK	AUM	BHCK	GUST	KMBS	KU	PAAET	Grand Tol
25 to 34	4	5	0	1	3	3	7	1	1	2	1	0	28
Female	4	4	0	1	2	2	6	1	1	2	1	0	24
Computer knowledge	4	0	0	1	0	0	1	0	0	0	1	0	7
Other: Invigilation	0	1	0	0	0	0	0	0	0	0	0	0	1
Other: Seeing the students work and individual mistakes in the work	0	0	0	0	0	0	1	0	0	0	0	0	1
Technical issues	0	0	0	0	1	1	1	0	0	2	0	0	5
Time limitation	0	1	0	0	0	1	0	0	1	0	0	0	3
Using online learning platforms (e.g. Moodle, Blackboard, etc.)	0	2	0	0	1	0	3	1	0	0	0	0	7
Male	0	1	0	0	1	1	1	0	0	0	0	0	4
Technical issues	0	1	0	0	0	1	1	0	0	0	0	0	3
Time limitation	0	0	0	0	1	0	0	0	0	0	0	0	1
35 to 44	4	5	4	0	1	6	0	4	5	1	0	0	30
Female	2	3	1	0	0	5	0	0	2	0	0	0	13
Computer knowledge	2	0	0	0	0	0	0	0	0	0	0	0	2
Technical issues	0	3	0	0	0	4	0	0	0	0	0	0	7
Time limitation	0	0	0	0	0	1	0	0	2	0	0	0	3
Using online learning platforms (e.g. Moodle, Blackboard, etc.)	0	0	1	0	0	0	0	0	0	0	0	0	1
Male	2	2	3	0	1	1	0	4	3	1	0	0	17
Technical issues	1	1	2	0	0	0	0	2	1	1	0	0	8
Time limitation	0	1	1	0	1	1	0	0	2	0	0	0	6
Using online learning platforms (e.g. Moodle, Blackboard, etc.)	1	0	0	0	0	0	0	2	0	0	0	0	3
45 to 54	1	5	2	0	2	2	3	1	4	0	0	2	22
Female	0	3	1	0	2	0	3	1	0	0	0	2	12
Computer knowledge	0	0	0	0	0	0	0	0	0	0	0	2	2
Other: Student attendance	0	0	0	0	0	0	1	0	0	0	0	0	1
Technical issues	0	2	0	0	2	0	1	1	0	0	0	0	6
Time limitation	0	0	1	0	0	0	0	0	0	0	0	0	1
Using online learning platforms (e.g. Moodle, Blackboard, etc.)	0	1	0	0	0	0	1	0	0	0	0	0	2
Male	1	2	1	0	0	2	0	0	4	0	0	0	10

Computer knowledge	1	0	0	0	0	0	0	0	0	0	0	0	1
Other: I would like to have better students	0	1	0	0	0	0	0	0	0	0	0	0	1
Technical issues	0	0	1	0	0	1	0	0	3	0	0	0	5
Time limitation	0	1	0	0	0	1	0	0	1	0	0	0	3
55 to 64	0	4	2	1	2	1	4	0	0	0	0	1	15
Female	0	2	1	1	1	1	3	0	0	0	0	0	9
Computer knowledge	0	1	0	1	0	0	0	0	0	0	0	0	2
Technical issues	0	1	1	0	0	1	2	0	0	0	0	0	5
Time limitation	0	0	0	0	1	0	0	0	0	0	0	0	1
Using online learning platforms (e.g. Moodle, Blackboard, etc.)	0	0	0	0	0	0	1	0	0	0	0	0	1
Male	0	2	1	0	1	0	1	0	0	0	0	1	6
Computer knowledge	0	0	0	0	0	0	0	0	0	0	0	1	1
Other: Time limitation - Frequent changes to the administrative processes	0	1	0	0	0	0	0	0	0	0	0	0	1
Technical issues	0	0	0	0	0	0	1	0	0	0	0	0	1
Time limitation	0	1	0	0	0	0	0	0	0	0	0	0	1
Using online learning platforms (e.g. Moodle, Blackboard, etc.)	0	0	1	0	1	0	0	0	0	0	0	0	2
56 to 64	0	0	0	0	1	0	0	0	0	0	0	0	1
Male	0	0	0	0	1	0	0	0	0	0	0	0	1
Time limitation	0	0	0	0	1	0	0	0	0	0	0	0	1
65 to 74	0	2	0	0	0	1	0	0	0	0	1	0	4
Female	0	1	0	0	0	1	0	0	0	0	1	0	3
Computer knowledge	0	0	0	0	0	0	0	0	0	0	1	0	1
Technical issues	0	0	0	0	0	1	0	0	0	0	0	0	1
Time limitation	0	1	0	0	0	0	0	0	0	0	0	0	1
Male	0	1	0	0	0	0	0	0	0	0	0	0	1
Technical issues	0	1	0	0	0	0	0	0	0	0	0	0	1
Grand Total	**9**	**21**	**8**	**2**	**9**	**13**	**14**	**6**	**10**	**3**	**2**	**3**	**100**

Survey Questions

Technology-Enhanced Learning (TEL) Survey

Technology-enhanced learning (TEL) has proven valuable for its ability to engage learners and be adapted to individual needs, even when students must learn without the advantage of classroom attendance. TEL is still in the process of evolving, and we would like to know your ideas about how it could be used most effectively. Please share your insights as you answer the following questions.

1. What is your gender?

____ Male
____ Female
____I prefer not to choose

2. What is your age?

___ 25 to 35
___ 36 to 45
___ 46 to 55
___ 56 to 65
___ 66 or older

3. What university of college are you working at?

___ ACK – Australian College of Kuwait
___ GUST – Gulf University for Science and Technology
___ AUK – American University of Kuwait
___ AOU – Arab Open University
___ BHCK – Box Hill College Kuwait
___ ACM – American College of the Middle East
___ AUM – American University of the Middle East
___ KMBS – Kuwait Maastricht Business School
___ AC – Algonquin College Kuwait
___ AIU – American International University
___ KU – Kuwait University
___ PAAET - The Public Authority for Applied Education and Training

Best Practice

1. When you use electronic devices such as computers, TVs, and IPads (referred to as IoT "the Internet of Things), what do you think of using it as a teacher?
____ Does not fit my teaching style
____ Do not know how to use it effectively
____ Do not have access to these types of devices
____ Do not feel I know enough about IoT to use it in my teaching
____ Do not see the added value in using it

2. Which of the following best explains how you would use IoT if you had access to the technology and knew how to use it? (Select all that apply):
____ To collect data automatically
____ To watch for trends
____ Use of devices for automated tasks
____ Create new ways for students to learn
____ Managing and record various user data such as test scores
____ Monitoring students' attendance
____ Monitoring students' engagement
____ Developing communication and connectivity among learners/teachers

3. What are some ways that Big Data is impacting education and improving teaching and learning? (Select all that apply):
___ Improving the speed and accuracy of feedback
____ Improving teaching by using different platforms.
____ Improving learning by identifying students at risk
____ Providing privacy to both teacher and students.
____ Helping to create a common use experience

4. Factors that can enhance TEL to enhance the best practice? (Rank them from most important):
___ Availability of TEL support staff.
____ Feedback from students
____ Feedback from teachers
____ Support from senior management
____ Availability and access to tools across the college
____ Workshops for teachers and students
____ Meeting student satisfaction
____ Improving administrative processes

5. What are the online learning platforms that are used at your institution? (Select all that apply):
___ Moodle / LMS
____ Blackboard

____ Lockdown browser
____ Safe exam browser
____ Zoom
____ Teams
____ Forms
____ Stream
____ Turnitin
____ Other (please specify)

Student Engagement

6. Which of the following student engagement methods do you feel are most productive?
____ Active learning
____ Virtual classroom
____ Peer instruction
____ Flipped classroom
____ Field trips
____ Student-choice individual projects
____ Lecture recording
____ Mobile learning
____ E-assessment

7. Are your students more engaged in the online learning by?
____ Collaborative learning
____ Individual work

8. Do your students enjoy using technology in the classroom?
___ Yes
____ No

If No: please explain

Assessments and Feedback

1. Providing personal feedback on students' work can be challenging in the TEL environment. Which of the following methods do you feel would be most effective?
____ Teacher providing feedback to each student individually by recording audio
____ Teacher providing feedback to each student individually by video
____ Written comments on the paper
____ A completed scoresheet returned with the paper
____ Peer assessment to give feedback
____ Other (please specify)

2. What is your greatest challenge in assessing student work in the TEL environment?
____ Time limitation
____ Technical Issues
____ Computer knowledge
____ Using online learning platforms (e.g. Moodle, Blackboard, etc.)
____ Other (please specify)

General Question

What other insights and possible solutions would you like to share regarding TEL, best practices, student engagement, and assessment and feedback**?**