

# Investigating Students' Perceptions Of Technology-Enhanced EMI Classroom

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## Abstract

The technological advancements in recent years coupled with the increase in government initiatives towards adopting English as a Medium of Instruction (EMI) in classrooms have necessitated the need to investigate technology interventions designed to assist learners in EMI higher education. This study implements action research with a qualitative exploratory design, using open-ended surveys, face-to-face interviews, and reflective papers to investigate the perceptions of EMI students on the introduction of mobility, which is learning at their own pace at different times outside the classroom, via technology to assist them in overcoming their challenges in an EMI context. The analysis revealed that the students found the support provided through the use of technology to be effective on a day-to-day basis due to the level of affection management, self-efficacy, fun, quick revision of concepts, new idea-generation, interactivity, and autonomy achieved. Implications of introducing mobility are suggested for policymakers and lecturers around the world in the EMI context.

**Keywords:** Technology-enhanced classrooms, technology in EMI, mobile-based learning, digital technology in EMI classrooms

## 1. Introduction

The advancements in recent years have made technology an integral part of human lives. Modern technology has morphed into a cornerstone that virtually influences all sectors of the economy and almost every facet of our life. Over recent years, the use of technology has encompassed the social, business, and educational contexts (Mbukusa, 2018). The higher education sector has witnessed a radical increase in the use of technology for communication, simulation, interactivity, and resource access. It is widely used by educators as a teaching aid and to improve student learning (Debevic, Shih and Kashyap, 2006). Furthermore, Mbukusa (2018) argues that

technology can be an incredible strength of the higher education classroom. The technology holds promise for education and its skillful use can effectively support active and application-based learning in the classrooms (Glover et al. 2016; Hargis et al. 2013). The portability and flexibility offered by technology have led to increased use in education, both within and outside the classroom (Santos & Ali, 2012). Moreover, it has now become a mandate for education to be transformed from the traditional approaches of teaching and learning in order to stay competitive (Jagannath, 2020).

Looking at the current situation and competition in educational technology, several players have already entered the market who are providing

unique and quality education. Now, it has become more important to study the factors which affects the student's adoption and interest in Technology Enhanced Learning (TEL) so that the educational institutes can learn from them and can create better techniques that are beneficial for learners (Dubey & Sahu, 2022). A few studies in the past have stated that TEL enhances students' self-regulation, thinking ability, self-direction, their way of communication, and collaboration skills (Chauhal et al., 2021; Irwin et al., 2012; Lin and Jou, 2012), whereas a few have found that TEL may lead to student distraction, disengagement, and low level of learning (Heflin, Shewmaker, and Nguyen, 2017). Thus, it is crucial to find out the impact of technology-aided learning in varied classroom settings.

As EMI is being increasingly used for teaching academic subjects in higher education, technology enhanced EMI classroom has become a vital subject to contemplate. EMI is defined as the use of English as an academic language of teaching in countries where English is not the first or primary language for the wider population (Macaro, 2018, p. 1). There has been an exponential growth towards the use of English as a medium of instruction (EMI) rather than just being taught as a foreign language at schools, colleges, and universities worldwide. Currently, 51 out of 54 countries globally have implemented EMI in classrooms (Dearden, 2014). Looking closely, it is seen that in China, 132 out of 135 higher educational institutes (Lei and Hu, 2014), in Japan, 40% of 779 universities (MEXT, 2017; cited by Soruç and Griffiths, 2017), and in Italy, 35 universities at the undergraduate taught-classes (Macaro, et al., 2019) have adapted to EMI at tertiary level. Driven by the globalization and the focus on creating a knowledge economy, a vast majority of the higher education institutions in the United Arab Emirates (UAE), and other nations in the Gulf region, have been implementing EMI at the tertiary level (Mouhanna, 2016).

The present research is an action research study conducted at the branch campus of an Australian university based in UAE. The primary medium of instruction at the institution is English throughout all campuses worldwide and technology in diverse forms is used for teaching and learning. The institution offers diverse programs through the school of engineering and information technology, the school of business, and the school of humanities. The lecturers come from very diverse cultures and backgrounds, such as Australia, the United States of America, India, Pakistan, and Sri Lanka. For the majority of academic staff, English is not the native language but is well-versed linguistically.

## 2. Literature Review

Technology has become an integral part of human life. Like all sectors of the economy, digital technology has gained prominence in the education sector as well (Dos Santos, 2022). The integration of computers, iPads, smartboards, online applications, learning management systems and other technologies are being widely used to offer a unique and engaging learning experience to the students (Carhill-Poza and Chen, 2020). The use of such online learning tools has increased in recent years. Such a shift can be explained by several factors like the focus on flexibility of students, allowing free access to education, open communication with the teachers and the recent pandemic (Al Yakin et al., 2022). Furthermore, universities worldwide are introducing the advanced teaching and learning methods to attract a significant number of overseas students, improve the quality of education and provide a greater level of comprehension (Shamim et al., 2022; Rachman et. al., 2022; Murata, 2018).

The rapid growth of technology-based learning has its implications in several other ways, such as formulating policies that may boost the growth of this higher education sector. Internationalization

of the higher education sector requires countries to reevaluate their macro, meso, and micro educational institutes to bring a successful policy change and implementation. Moreover, Thota (2015) states that "collaborative learning with technology embraces the use of digital, mobile, and networked devices within a group of learners." Some examples of technology in classrooms include smart audience response systems, also known as clickers (Caldwell, 2007), computer-supported collaborative learning (CSCL) tools, such as Moodle, blackboard, and iCloud works (Thota, 2015), and mobile-based learning. One of the very well-known mobile-based learning tools is Kahoot! which allows students to use their mobile phones or tablets without speaking aloud (Asa'd & Gunn, 2018; Barnes, 2018).

This study investigates students' perceptions on technology enhances EMI classrooms with a focus on UAE. The Gulf economy is now more focused on developing the higher education industry sector for the past few years. The government is now diversifying its dependence on oil revenues towards a knowledge-based economy. Therefore, the education sector is one of their top priorities. Furthermore, diversified strategies are currently being tested and implemented to increase educational attainment rates in the region. With the internationalization strategy, UAE is taking initiatives to become one of the biggest countries around the globe to facilitate transnational Education. Western universities are now opening their off-shore campuses to increase inbound learner mobility and reduce outbound mobility.

A study by Yuan (2021) highlighted that EMI had become a popular strategy in many universities globally. Conversely, Tamtam et al. (2012) argued that many countries had not paid significant attention to technology-based learning across Asia, Africa, and Europe. Furthermore, Tamtam et al. (2012) revealed that graduates' job

prospects increase in labor markets through knowledge-intensive and technology-led learning. However, the less focus on tech-based learning in many higher education institutes implies that less qualified academic staff, fewer funding levels, cultural oppositions, lack of interest of learners make this learning strategy difficult to implement. A recent study by Orduna-Nocito, & Sánchez-García (2022) observed that some universities had adopted this learning strategy due to internationalization, which has certainly impacted the learner's learning and teaching methods instructors. These issues raise another essential point that, in most cases, instructors' experiences are not aligned with the formulated policies of universities to adopt advanced learning methods. Another concern is that with the introduced concept of internationalization, there has been a notable increase in several courses being taught with advanced technological methods. This adoption has rapidly penetrated to other parts of the world, from Europe, in the past few years. Also, this technology-based learning has now become a global trend in countries like Japan and China. Moreover, the provision of such learning techniques has largely influenced rankings of universities and public fundings. Simultaneously, faculty hiring has been dominated by the ability to teach using advanced ways.

Using technology in the educational process also promotes collaborative and interactive learning. As Chuang (2017) states, to achieve better academic results and deliver content innovatively, instructors adapt collaborative learning to increase the rate of interaction between instructors and students. Dillenbourg (1999) defines collaborative learning as a circumstance where more than one person learns together. One such way of adapting to cooperative learning is through technology in classrooms. The widespread internet facilitating e-learning and World Wide Web tools have changed twenty-first-century learning and

teaching tremendously (Thota, 2015). Miles (2021) took the sample of laptop mediated English language pre university course in United Arab Emirates and concluded that the introduction of Technology Enhanced Learning (TEL) initiatives have not revolutionized teaching and learning in preparatory courses in UAE.

The rise of economic development due to globalization and internationalization has increased the foreign population in the UAE by double in the last six to seven years (Boyle, 2011). This huge influx of foreign workers has led to an increase in technology-based learning as it prepares learners to think more critically. Technology-based learning allows learners to place issues in a global context, thereby further enhancing knowledge. Similarly, policies have shifted their paradigm towards using advanced technologies as a medium of instruction in developing countries, making instructional engagement more of a tool than a subject (Wanphet and Tantawy, 2018). For instance, Azman and Yunus (2019) found that educational institutes that provide 1:1 devices to their students actually replace the conventional classroom approach of “plain talk and chalk” with online student response system such as Kahoot! Which is more entertaining and fun for the learners. Furthermore, several schools and universities in such contexts have adapted to the advanced teaching styles with the primary goal of increasing students' collaborative learning (Dang, Nguyen, and Le, 2013; Belhiah and Elhami, 2015).

## 2.1 EMI Adoption

This section focuses on the current state-of-the-art challenges faced in EMI classrooms globally and in the UAE, followed by existing strategies or solutions used to overcome such challenges. Although the dramatic widespread of EMI, existing studies expound on the challenges faced by learners; for instance, Milligan and Tikly

(2016) state that learners face difficulties in adapting to EMI classrooms due to the pressure and lack of choice. In many situations, students prefer using their native language and feel resistant towards engaging in classrooms and the curriculum in English (Nqoma, Abongdia, and Foncha, 2017). This is identified as a 'Language 2 proficiency gap' (Johnson and Swain, 1994; cited by Milligan and Tikly, 2016), while others argue that it is an equity concern for the low-income countries with implications on social justice (Alidou et al., 2006). There are instances where students study in an EMI context from elementary school but face difficulties in higher education classes. The main cause behind this is the pupil's inadequate conceptual development due to a lack of content knowledge and a poor grasp of the English language (Nqoma, Abongdia, and Foncha, 2017). To support that, Soruç and Griffiths (2017) identified five themes, out of which cognitive difficulties are one of the vital issues faced by learners. Furthermore, this leads to situations where such students participate less in group activities or classroom discussions due to fear of making mistakes. The same goes for instructors who are not confident in the English language and tend to skip over a few concepts when explaining the same (Nqoma, Abongdia, and Foncha, 2017).

Researchers have suggested several strategies to overcome the existing challenges faced in the EMI context. For instance, in Italy, Macaro et al. (2019, pp.20-21) found that note-taking, guessing, and translating technical terminologies or vocabulary allowed students to overcome some EMI difficulties. In Turkey, Soruç and Griffiths (2017) suggested strategies to overcome EMI challenges by using cognitive and learning tools of visualization, exemplifying, using a dictionary in class, translating the language, using paralinguistic in class, and asking questions to clear any doubts. In Japan, Rose, Curle, Aizawa, and Thompson (2019) suggested that students with lower proficiency should be given specific

language support to perform better. Similarly, in Korea, Kym and Kym (2014) concluded that EMI cannot exist independently in higher Education without having prerequisites for the participants – the students and instructors, to obtain a certain level of English proficiency. Early and Norton (2014) explored secondary school EMI classrooms in Uganda to suggest using digital media, such as spatial performative, visuals, drawing on available resources, and live demonstrations, to make abstractions more concrete for students to relate the content to the dominated language. Furthermore, institutions widely set up language policies to enhance and maintain language literacy in multilingual communities.

### 3. Research Objectives

The purpose of the study is to capture the students' perceptions of technology-enhanced EMI classrooms and to know investigate if this proposed solution proves to be effective with subjective reasoning.

The research questions (RQ) that this study answers are enumerated below:

**RQ1.** What are the students' views about their experience with the technology-enhanced EMI classroom?

**RQ2.** To what extent do learners in an EMI classroom believe that technology-enhanced EMI classrooms are effective and why?

**RQ3.** What are the learners' perceptions on implementing the proposed solution in other EMI classrooms?

### 4. Theoretical Background

It is vital to know why people accept, reject, or continue the use of technology. For this, various models have been formulated in the past among which Davis et al. (1989) articulated the

Technology Acceptance Model (TAM). According to the TAM model, ease of use and perceived usefulness of technology are two dominant factors that determine the user acceptance of technology (Alfadda & Mahdi, 2021). This means that if the user believes using a technology would enhance his or her job performance, and he or she will have to use less effort in accomplishing the task, then technology acceptance is quite likely. The TAM model also focuses on three more variables, namely, behavioral intention to use, attitude toward use, and the actual use itself (Alfadda & Mahdi, 2021; Katebi et al., 2022). Behavioral intention to use is the tendency to continue using technology in the future which further impacts on the actual use of the technology itself (Mailzar et al., 2021). Thus, behavioral intention is mediated by the effects of the attitude towards use of technology (Mailzar et al., 2021).

Contemplating the learners' perception on the technology enhanced classrooms, this study is well grounded in the Technology Acceptance Model.

### 5. Research Methodology

This study uses an action research framework while taking a qualitative exploratory design approach. Action research, for it is defined as an inquiry adapted by educators in their settings to improve their practices as well the learning process of students (Burton & Bartlett, 2004; Menter et al., 2011). Action research studies are action-oriented and have an intention of bringing improvements in the local situation which are to be applied in the bigger environment as well (Dick, 2015).

This study gives importance to human values, their interests, and choices behind their actions, hence, it made action research approach most suitable than other traditional approaches or methodologies (Efron and Ravid, 2013). Besides,

the research is conducted by an insider rather than an outsider that makes it subjective, involved, and engaged. The participants in the study are a natural part of the inquiry and each individual

participant is unique rather than being generalized. The figure below describes the action research cycle applied in the study:

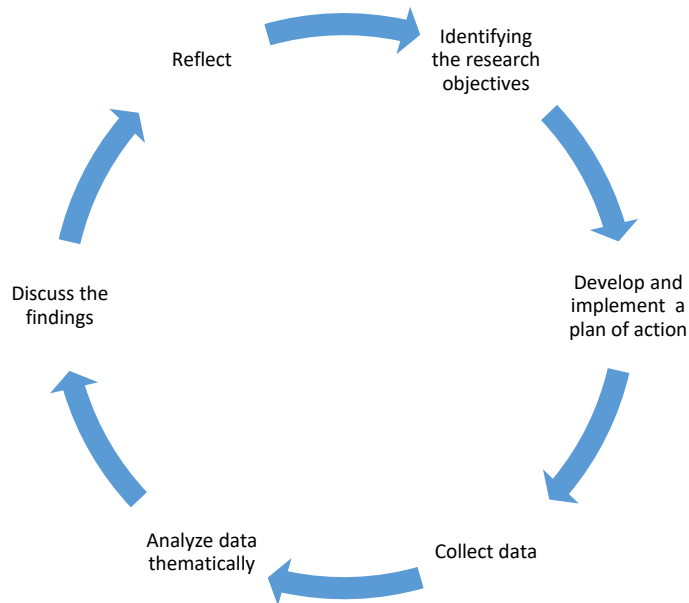


Figure 1: The Action Research Cycle

### Participants and Sampling

The research was conducted with a total of 50 undergraduate students, both males and females, undertaking the ‘Science Communication’ class at an Australian University’s branch campus in Dubai, UAE. For questionnaires and reflection papers, convenience sampling was undertaken due to the ease for the researcher to collaborate with the students and take weekly updates. Moreover, the students were motivated by providing bi-weekly incentives in the form of appreciation, chocolates, vouchers or handy electronic items, during the class interaction that occurred once every week. It is important to motivate the students as it brings in readiness for learners to actively take part and learn content in a program for development (Cole, Feild, and Harris, 2004). On the other hand, to select interview participants, purposive sampling, which is a non-random sampling technique, was used. This is mostly applicable for qualitative

studies (Suen, Huang, and Lee, 2014), to specifically select candidates to serve an investigative or exploratory purpose rather than just reproducing statistical representative of a population (Carter and Little, 2007). This sampling technique was applicable for selecting subjects relevant to the study based on the needs and motivation of the research so that rich information could be accumulated. Of the 40 students, 10 students of the class were selected for interviews. The inclusion criteria for the selected interviewees were:

- (a) The candidates were from a non-native English-speaking background.
- (b) The candidates showed neutral or unhappy feelings on their previous experience in EMI classes.
- (c) The candidates participated regularly, if not always, in the WhatsApp group.

### Data Collection

To collect data from a variety of perspectives and to be able to cross-check data to further increase reliability, different data collection instruments, such as, questionnaires, reflection papers, and interviews were employed within this exploratory framework as discussed below. Before every data collection procedure, students were informed that this will have no outcome on their overall academic results.

### Data Collection Procedure

This research is divided into three phases as seen in figure 1 below. The first phase is the preliminary phase that includes the distribution of open-ended questionnaires to all the participants. The second phase included the employment of the WhatsApp group where different material was sent 4 days a week for a month to all the participants. The material ranged from fill in the

blanks, multiple-choice questions, short answers, generic technical explanations, explanatory videos recorded by the lecturer, voice notes and informative links. It was sent during random hours of the day. At the end of each day, students were asked to confirm if they have read the material for information that was read-only, whereas, questions that required an answer were kept track of from within the WhatsApp group based on their responses/participation. This was further noted in an excel sheet. After completion of four weeks (phase 3), the WhatsApp group was made inactive. During this phase, reflection papers were distributed and collected from all the participants and interviews were conducted from 10 participants. Each interview lasted for around 8 – 10 minutes and were conducted on campus in the meeting rooms.

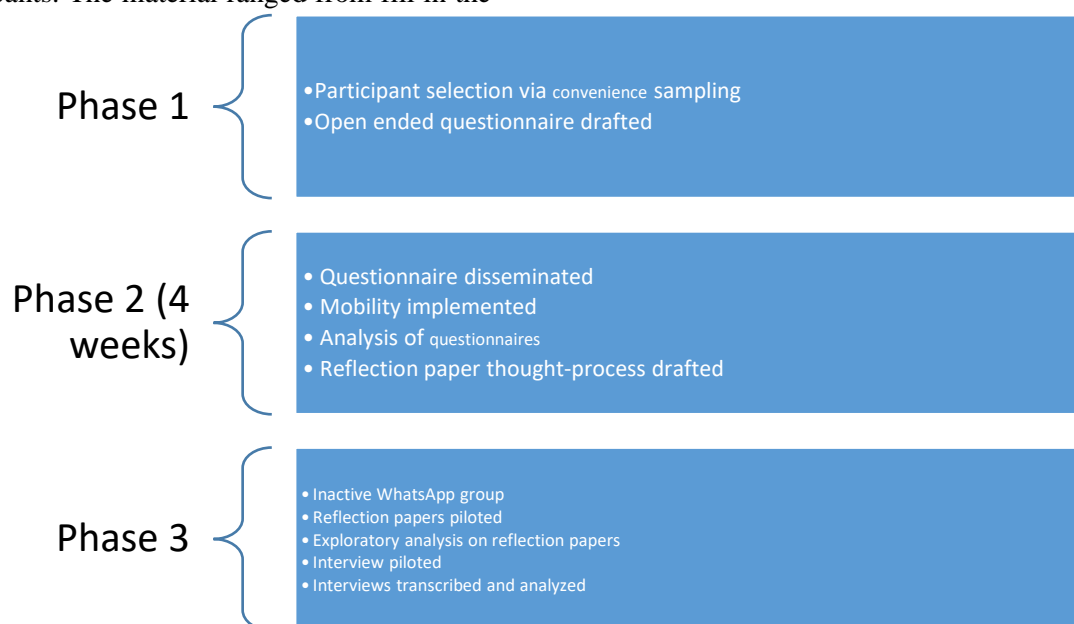


Figure 2: Phases of the study and data collection

### 6. Data Analysis

The current research employs thematic content analysis for effective data exploration as it can report “experiences, meanings and the reality of participants” (Braun and Clarke, 2006, p81) by “identifying, analyzing and reporting patterns

(themes) within data” (Braun and Clarke, 2006, p79). This differs from other qualitative analysis such as grounded theory, and interpretative phenomenological analysis (IPA) as it doesn’t require in-depth technological and pre-existing theoretical knowledge of approaches (Braun and Clarke, 2006).

This research employs the approach of emerging categories over predetermined categories as described by Efron and Ravid (2013, p.178). Firstly, data was broken down into segments to develop a list of codes. Secondly, themes were identified around similar code segments grouped together. Thirdly, themes were organized into categories that related to each other. In this research, the use of questionnaire was limited to gathering background information of the students in class. Thus, the responses on how they felt about their previous EMI learning were analyzed and put under three categories – happy, neutral, and unhappy.

The entire code, segment and theme generation process was done by the following procedures:

- The reflection papers presented written communication, hence, the data was read and reread multiple times before separating it into particular elements, categories, and patterns.
- an A4 sized paper and pen was used for note-taking during the interview sessions and the interviews were also recorded using a mobile recorder, which was later played and listened to multiple times to further transcribe.

A comprehensive data analysis process was used by the researchers that included questionnaires, reflection papers, and interviews to ensure closeness to the data. Although qualitative data analysis software such as Nudist and Atlasti (Barry, 1998; Hwang, 2008) or NVIVO (DiCicco-Bloom and Crabtree, 2006; Bringer, Johnston, and Brackenridge, 2006; Leech and Onwuegbuzie, 2011; Zamawe, 2015) exist and are growing popularity, however, such software only aids the analysis process in the presence of the researcher, but cannot analyze or interpret data on its own (DiCicco-Bloom and Crabtree, 2006; Zamawe, 2015).

## 7. Findings and Discussion

The themes emerged from the interviews and the reflections papers are employed as followed:

### Theme 1: Managing affections

The most recurring theme to have emerged from interviews and reflection papers is the level of comfortability felt by students due to the mode of interaction used between them and the lecturer. Moreover, they felt affectionate because of having this medium to also clear their doubts that occurred at different times at their own pace. For instance, when asked to reflect on their views on the experimented learning, the following was quoted:

Respondent A: It gave a comfortable feeling as I know there was a place, I could clear my doubts informally.

Respondent B: the WhatsApp information helped me gain more information and cleared most of the questions running in my mind, which I would hesitate to ask in class.

Thus, this employs that when students are online, they feel more comfortable and can communicate easily. In Soruç and Griffiths (2017), it was found that students did not know how to deal with their feelings in the class. Similarly, Chou (2018, p.627) suggested that an online medium to be implemented to “reduce anxiety resulting from face-to-face communication”, hence, using this technology as a mode of interaction, students can deal with their emotions and nervousness openly by prompting a question on the group when needed.

### Theme 2: Self-efficacy

Due to regular participation in the group, a few students felt more confident in classes and were able to take part in open discussions. For instance,



the following were recorded on the reflection papers:

Respondent C: It gave me a source of confidence because I went through the information sent on the group before class and that made it easy for me to answer the questions raised in class.

Respondent D: I feel I would be lost without the group, not knowing what to do exactly!

Bandura (1986) reflected on self-efficacy theory as the belief a student has on him/herself with regards to their capabilities in doing certain tasks based on certain criteria. A limitation found in Lueg and Lueg's (2015, p.25) study with EMI students in Denmark was the use of "constructs on general self-efficacy" and the implementation of the same. Hence, the terms used by students such as 'confidence' and 'lost without the group' shows their dependency on the group and also that their belief, i.e. confidence in themselves increased by the aided technology that allowed them to perform in class without any hesitation. This further implies that when the EMI classes are enhanced by technology can improve students' efficacy or learning or belief in their ability to learn. Besides, this proves to be an excellent advancement on behalf of the students as Pajares (2002) states that students with high self-efficacy tend to engage adaptively in learning tasks concerning the psycho-emotional states such as lesser anxiety and stress than those who have less efficacy beliefs.

### **Theme 3: Fun – Multiple resource types**

As the type of material sent to students differed daily, some students found exposure to different activities exciting, in particular, when it was audio/visual information. For instance,

Respondent D: I wouldn't understand referencing that well by just reading it, but the video that was

sent on how to indent it and arrange it alphabetically actually made me learn by watching and applying it in my work, which I really liked!

Respondent E: I liked the use of voice notes sent in the group because I could listen to it anywhere, even while I was driving.

This shows that using different resources via the technology-based group, enhanced the learning process of students by giving them a feeling of happiness overall. In the study conducted by Chuang (2017, p.654), one of the limitations of MEMSIS was that "some students might easily become bored with the course's theories and technical terms", hence, by the use of the mobile technology implemented in this study, the feeling of getting bored can be eliminated by engaging with students using various types of resources. Similarly, Popov, et al. (2014) conducted a study on perceptions of students in computer supported collaborative learning and found limitations in terms of lack of nonverbal, visual, and social context, therefore, this study overcomes that limitation by using multiple resource types.

### **Theme 4: Online platform – A new milieu**

The overall presence of the WhatsApp group learning provided an interactive environment for the students. Students felt less formal than the classroom learning environment and could open-up easily whenever they liked. The below was quoted by students:

Respondent F: Using WhatsApp, made me feel more home-like as if I was reading something sent by a friend, which made it comfortable for me with no serious restriction.

Respondent G: I preferred constant messages sent at different times as it would

remind me to study or work on a particular task that I would have forgotten about instead.

Respondent H: It was a new way to learn, not restricted to classrooms which I liked.

This implies that using a technology-enhanced online learning platform allows students to overcome the boundaries of classroom learning, such that they can learn via an interactive medium and at their own pace. This further gave them a sense of relaxation when they learn every time or every moment as they are all mobile. Mengel, Kuszpa, and de Witt (2010) states the importance of mobile learning significantly being the independence of location and access to information in their respective situation. Thus, looking at the responses, the same is identified as it gave them a sense of personalization to learning.

Besides the themes discussed above, it was also seen that a student mentioned that he did not participate frequently in the group because of 'feeling shy' due to the thought of 'answers not being right'. A further recommendation for the same has been stated under the 'Limitations and further recommendations' section of this paper.

### **Theme 5: Increased impact on academic writing skills**

During interviews, the following was recorded:

Respondent I: It was a tremendous help in improving my academic writing skills when compared to other forms of studying.

Respondent J: It helped me understand qualifiers, back-up claims, rebuttals very well which was very much needed for improving my writing.

Respondent K: It helped me improve my writing skills, in-text citations, and references using APA.

This implies that the WhatsApp group tremendously helped students in gaining English academic writing skills, which is part of the unit deliverable. An increase in English skills also reflects on the success of EMI, for instance, Rose, Curle, Aizawa, and Thompson (2019) found that increase in academic language skills based on students' ESP grades predict success in EMI. Thus, it can be said that the increase in academic writing skills identified in this study also demonstrates the success in EMI.

### **Theme 6: A platform for revising concepts**

A lot of responses stated about the effectiveness of the WhatsApp group for revision. For instance,

Respondent L: It really helped me in revising and completing my homework.

Respondent M: Sometimes before coming to class, I would open up the group conversation to see what was shared earlier as a revision for myself.

This signifies that technology-enhanced learning provided a useful tool for students for revising concepts outside classrooms to further improve their learning and retain knowledge.

### **Theme 7: A platform for generating new ideas collaboratively**

This is a very prominent theme that occurred during reflection papers. A few responses are shown below:

Respondent N: On the whole, through WhatsApp, I feel my learning on sci comm has strongly improved with more new ideas and knowledge.

Respondent O: Seeing the opinions and answers of different people, allowed me to see the possible choices from it.

Respondent P: I wanted the group to continue as it was helpful and I had some doubts and tips to share which I couldn't.

These students' writings indicate that many of them felt that the technology-enhanced learning group was a good platform for sharing and gaining ideas collaboratively. This echoes Shehadeh's (2011) findings on collaborative writing enabling students to generate and pool ideas together. Also, it reflects Elola and Oskoz's (2017) study that emphasized on integrating information and computing technology for students to work collaboratively and from any location outside class.

Besides the themes discussed above, a drawback was that the group sometimes went off-track as a student quoted "Sometimes the group diverged from the main discussion". This could happen because students would sometime initiate discussions related to the submission of assignments or about other subjects that they were mutually enrolled in.

### **Theme 8: Autonomous learning platform for all**

A few interviewees responded:

Respondent R: It addresses self-learning, something like google, where you learn on your own by searching for relevant information. But in this, information was automatically given to us and we could learn that on our own.

Respondent S: I couldn't concentrate much during classes as I work the night

shift, my head hurts so the group was my primary learning source... if I needed something I would look up at the group whenever required.

This implies that the technology-enhanced group gave students a self-paced learning platform that helped regular students as well as working students because of the autonomy provided. It is in-line with Chou (2018), who stated the importance of implementing autonomy in classes for students to overcome anxiety and hesitation. Besides, overall, the participants highly suggested this to be used for other EMI classrooms as they found this to be a new autonomous interactive way of mobile learning.

### **Theme 9: Benefit to students undertaking theoretical courses**

A student raised an important point on thoughts of implementing this technology in other units, that this would certainly be beneficial for other EMI units as long as they are not too practical. For instance,

Respondent T: not for too highly technical courses like coding...

By this, he meant that units that involve programming and coding could be difficult to learn through this medium, however, those that involve theoretical learning would be beneficial. The main reason behind this is that coding skills are gradually developed over time by practice and might require some face-to-face interaction as well to understand concepts better. Hence, implementing this technology-enhanced learning mechanism in other EMI classes that are not too technical could be very beneficial.

## **8. Conclusion**

Higher Education has witnessed notable changes in the mode of instruction globally. The reason

behind such dramatic acceptance towards technology-based learning is to attract more students from other countries. This study further helps in concluding that technology-led learning requires universities to diversify their teaching methods. It is also essential to shorten the training programs to guide teaching strategies and crucial techniques for academic staff to stay competitive in the higher education industry. Such training programs need to be comprehensively designed to facilitate students and teachers coming from diverse environments. This study further helps understand the need to integrate blending learning programs into their instructional frameworks. The change in this instructional landscape of higher Education also implies a supportive attitude of stakeholders towards such active learning methods because of the added value to the education sector. This study further helps in summarizing that introducing technology-enabled dynamic learning models paves a direct pathway for universities to gain global recognition to attract international students. However, most importantly, a certain level of such technology's comprehension threshold must be stated by universities to understand the technology-led instructional context delivered in classrooms.

This study reveals students' perceptions of an enhanced mobile technology-enhanced classroom through exploratory research conducted in the UAE. Universities also find it much easier to capitalize on the mutual benefits generated by technology-led learning for learners, faculty, and the management. This research study outlays the effectiveness of mobile-learning technology implemented for learners to collaborate, effectively engage, and increase their productivity levels. The WhatsApp group created for a first-year undergraduate class in this context was used in the study to send relevant information to the participants for a month during different hours of the day during the week. The results showed that the mobile

WhatsApp group created for students led to increased self-efficacy, more personalized support and feedback. Such technological-enhanced interventions showed more satisfactory outcomes, thereby generating more substantial benefits for learners and educational institutes.

Moreover, students believed it to be effective in terms of the autonomy created, improvement in academic writing skills, a platform for revision, and generation of new ideas, collaboratively. Besides, they felt that applying such teaching techniques can be helpful for theoretical courses and also make them autonomous collaborative learners. Thus, this study explores a different way of tackling student challenges in EMI. For future reference, the findings can be shared with other departments in the University and implemented in different dimensions across various cohorts, universities, and localities.

## **9. Managerial Implications**

The research findings reveal the positive impact of the usage of technology in EMI classrooms. This study provides stakeholders with new perspectives on pervasive technology implementation inside and outside classrooms to engage students. This educational pedagogy when implemented widely by education policymakers can result in students managing affections, having self-efficacy, and enjoying learning in a fun, collaborative environment using multiple resources. The use of technology for learning outside classrooms also gives students flexibility toward autonomous learning. Thus, the stakeholders must implement a platform designed particularly for students that would aid them in learning and progressing through the additional help and resources provided autonomously throughout the week.

## **10. Limitations**

The present study is qualitative in nature and has been done with participants from the first year of

the undergraduate study group only. Another limitation of the study is that sometimes the group went off-track in between and also, a few students hesitated in participating due to feeling shy and unsure about their answers.

### 11. Scope of Future Research

Considering the nature of the study and its present limitations, there is a scope of further research in this area. The study can be extended with the other year of study groups to get a broader perspective. Quantitative research can be conducted in an experimental design to conclude both the methodologies to avoid the biased impression of the study purely being qualitative. To overcome the group going off the track and the students' hesitation towards responding in the group, a mobile-based application can be developed. This application can be set to send and receive questions/responses only during particular hours of the day, and also give students the option to respond anonymously.

### 12. d

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