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## Exploring the Adoption of Multiple Intelligences in Micro Credentials by Educators in Malaysian Higher Education

Mohd Elmagzoub Eltahir

*College of Humanities and Sciences, Ajman University, m.babiker@ajman.ac.ae*

Nagaletchimee Annamalai

*School of Distance Education, Universiti Sains Malaysia, naga@usm.my*

Samer H Zyoud

*College of Humanities and Sciences, Ajman, s.zyoud@ajman.ac.ae*

Najah Rajeh Al Salhi

*1 College of Humanities and Sciences, Ajman University, Ajman, UAE., n.alsalhi@ajman.ac.ae*

Bilal Zakarneh

*Department of Foreign Languages, Ajman University, b.ibrahim@ajman.ac.ae*

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### Abstract

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### Keywords

educators, higher education institution, micro-credential, multiple intelligence, qualitative study, technology

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## Exploring the Adoption of Multiple Intelligences in Micro Credentials by Educators in Malaysian Higher Education

Mohd Elmagzoub Eltahir<sup>1,2</sup>, Nagaletchimee Annamalai<sup>\*1,2,3</sup>, Samer H Zyoud<sup>1,4</sup>,  
Najah Rajeh Al Salhi<sup>5</sup>, and Bilal Zakarneh<sup>2,6</sup>

<sup>1</sup>College of Humanities and Sciences, Ajman University, Ajman, UAE

<sup>2</sup>Humanities and Social Sciences Research Center (HSSRC),  
Ajman University, Ajman, UAE.

<sup>3</sup>School of Distance Education, Universiti Sains Malaysia

<sup>4</sup>Nonlinear Dynamics Research Center (NDRC), Ajman University, Ajman, UAE.

<sup>5</sup>College of Arts, Humanities, and Social Sciences, University of Sharjah, Sharjah, UAE

<sup>6</sup>Department of Languages and Culture, College of Humanities and Sciences,  
Ajman University, Ajman, UAE

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This study explored the multiple intelligence representation in the micro-credentials designed by Malaysian educators and the reasons for integrating multiple intelligences in their course materials. The study was guided by the eight indicators of multiple intelligences suggested by Howard Gardner. We conducted in-depth qualitative interviews with 20 educators from a university in the northern region of Malaysia. The thematic analysis guided by Braun and Clarke shows a number of reasons why educators included the indicators in designing their content for micro-credential. Educators generally demonstrated that they used all the multiple intelligences indicators in designing the micro-credentials. The findings are encouraging and suggest that all eight intelligences can be included in designing micro-credentials to enhance students' learning experiences with the help of technology. Finally, the authors suggest a pedagogical framework that can be considered by educators who intend to design the micro-credentials.

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### Introduction

The conceptualisation of literacy practices in the 21st century learning has been significantly impacted by the technological revolution and globalisation, highlighting educators' necessity to include effective instructions.

In addition, there is a greater demand for quick and flexible learning methods for students, employers, and industries. Due to this demand, there is a greater interest in credentials that are simple to obtain and attest to skill competencies relevant to their necessities (see Varadarajan et al., 2023).

Around the world, educators are being pushed to look for novel forms of credentialing, like micro-credentials and to identify how well these fit with already-existing frameworks and a developing digital credentialing ecosystem (Ralston, 2021). Micro-credentials (MCs) are accepted documents that indicate acknowledged proofs of learning outcomes from shortened,

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\* Corresponding author

less exhaustive educational or training activities (McGreal & Olcott, 2022). Individuals can always use MCs to enhance their knowledge in a particular field or setting (Randall et al., 2013) and make learning possible outside of traditional educational settings (Carey & Stefaniak, 2018).

MCs improve traditional degree courses, support competency-based programmes, and link badge earners to potential employers and academic institutions (Carey & Stefaniak, 2018). They are also called “digital badges,” “web badges,” “micro-certifications,” or “nano-degrees” (Tomlinson, 2008). There have been a number of definitions given to MC by work conducted by UNESCO, the European Union, and local frameworks developed by countries like Australian and New Zealand (Desmarchelier & Cary, 2022). However, one common thread identified in their definitions is that MC should emphasise quality and exchange of credit.

Recognising the values of MCs, there is a sudden surge in embracing MCs as a method of assisting and preparing students with highly marketable skills while also meeting industry and business expectations (Ruddy & Ponte, 2019). MCs are one direction in which higher education institutions are responding to how learning is evolving and expanding beyond the classroom, and this undoubtedly has implications for pedagogical trends within universities (Ruddy & Ponte, 2021). The adoption of MC certification programmes has increased due to the COVID-19 pandemic (Hunt et al., 2020). In Malaysia, the pandemic has incentivised the quick introduction of a micro-credential online certification programme, supporting IR 4.0 goals to encourage digital usage and virtual learning (Che Ahmat et al., 2021).

While numerous frameworks, methods, and approaches have been developed and tested recently, little is known about educators’ experience in developing MCs in higher education. According to Oliver (2021), MCs are promising in the educational context and are still at the infancy level. Although MCs present exciting opportunities, they have not always been recognised or shown to be beneficial in many contexts (Oliver, 2021). Ralston (2021) highlighted that to situate MCs within higher education institutions, there is a need to look beyond definitions and place more emphasis on practical learning systems. Concerns are raised by Ralston's work and critiqued that the “micro-credentialing craze” (p. 83) appears to be centred on generating profits and does not meet the requirements of lifelong learning. Desmarchelier and Cary (2022) assert that it is time to “move beyond issues of definition and systemic blocks to focus on delivering valuable, worthwhile, and useful learning experiences that contribute to lifelong learning” (p. 2). Brown and Mhichil (2021) opined that MCs come in a variety of forms, so they should not be treated as a single, uniform idea, even though many frameworks, methods, and approaches have been developed and tested recently.

Thus, MCs need to be examined to demonstrate competencies (Hunt et al., 2020) and quality in course content. It is a common criticism that content and teaching methods do not consider the differences between students and their multiple and varied levels of intelligences (Keri, 2002). In other words, educational methods often treat all students as if they possess identical capabilities, interests, and learning preferences, despite the fact that this is not reflective of the actual diversity in student abilities and preferences.

Gardner (1983) believes that learners have unique qualities, independent styles, and varying preferences for acquiring knowledge (Fasko, 2001). Gardner also attempted to broaden the scope of human potential beyond IQ measurement in his idea of multiple intelligences (Taase, 2012). Therefore, an in-depth investigation of the MCs' content allows one to understand course content that indicates the pedagogical trend, knowledge, and skills that educators utilise in planning and carrying out their lessons to achieve effective learning outcomes. According to Selvaratnam and Sankey (2021), it is crucial to investigate the development, practicability, and sustainability of the developed micro-credential to ensure meaningful learning.

Gardner's theory has faced criticism from psychologists and educators alike (Morgan 1996, Peariso, 2008; Waterhouse, 2006). They contend that Gardner's concept of intelligence lacks specificity, essentially encompassing talents, personality characteristics, and skills within his eight designated "intelligences." Furthermore, Gardner's theory has also been criticized for its dearth of substantial empirical research to validate its claims. The research gap stemming from Gardner's theory revolves around the need for more robust empirical evidence to substantiate the existence and distinct nature of the multiple intelligences he proposed.

Based on these concerns, the current study makes an effort to meaningfully address dearth of understanding and awareness of educators' practices in designing MCs. This study provides a guide on how to plan, and design MCs as an instructional strategy. According to Clements et al. (2020), there needs to be more research on MC implementation. There is a gap concerning the design and the MCs especially educators' practices and pedagogical reasoning in higher education institutions, are investigated in this study.

The research questions for this study are:

1. What MIs are evident in the MCs designed by educators in the Malaysian higher education institutions?
2. Why do educators use this MI in designing their MCs?

The investigation of MI in MCs can point educators toward improving their course delivery because understanding the various intelligences and using various teaching approaches can optimise learning motivation and increase memory by speeding up the learning process. The study's findings are relevant for higher education institutions and micro-credential providers, in addition to adding to the body of literature. The current study can help educators to develop the appropriate skills for MCs by helping them to improve their course delivery.

## **Background of the Study**

The Malaysia Education Blueprint (2015-2025) demonstrates the Malaysian government's commitment to reforming higher education. The blueprint aims to bring Malaysian education up to par with international standards and prepare Malaysians for the future. The blueprint listed ten shifts, including producing graduates who are more well-rounded and balanced (Shift 1); encouraging lifelong learning; enhancing online learning; and changing the way higher education is delivered (Shift 10). The government's plan aligns with the current trend toward MCs, as many higher education institutions consider MCs as part of their pedagogical practices.

Nonetheless, these institutions might have a unique approach to MCs because providing a one-size-fits-all approach to MC is not recommended (Acree, 2016). Therefore, educational institutions may decide to develop micro-credentials in a way that is tailored to their particular context, goals, or learner needs. In other words, they might customize the design and content of MCs. MCs in higher education institutions in Malaysia are relatively new and were implemented in 2019. Universiti Sains Malaysia is leading the implementation of MCs, followed by Universiti Malaya, Universiti Teknologi Malaysia, e-Asia University, Open University Malaysia, and a few other institutions in Malaysia.

The Malaysian Qualifications Agency (MQA) sets guidelines on implementing MCs and the best approaches in Malaysia so that the MCs are well accredited and validated. The guidelines emphasise digital batches and certificates. In addition, each university must organise, manage, and approve the MC programme internally while adhering to the Malaysian Qualifications Agency (MQA) requirements. The MQA added that an MC programme is an

excellent substitute for a college degree because it is more flexible, competitive, accessible whenever needed, shorter, and less expensive than traditional degrees (MQA, 2020).

The implementation of the OpenCreds Framework in Malaysia (15th October, 2020), which is modelled after the credentialing (OpenCreds Australia) of Open Universities of Australia, is the initial step toward credit recognition across different countries and industries. To date, the Open-Creds has highlighted a set credits awarding system based on learning hours per credit system that conforms with the Malaysian Qualification Framework (MQF) (Openlearning, 2020).

In the university where the investigation is conducted (University S), instructors are guided to create the MC. University S has begun to provide MCs certification programme to current and prospective students. The Centre of Development of Academic Excellence (CDAE) is responsible for creating and promoting MCs modules using the institutional platform. In addition, a series of workshops and seminars were held to instruct the module developers on how to separate the courses into their component modules, create, edit videos, and include the appropriate assessments for each module. The MCs created by the educators can be accessed through the University S-hosted “learning4life” platform, which uses the OpenLearning platform as its primary learning management system.

### Literature Review

The following section illustrates the literature review on multiple intelligences, 21st-century learning skills and previous studies on MI and MCs.

#### Theory of Multiple Intelligences

Howard Gardner co-wrote the book, *Frames of Mind*, in 1983 with other researchers, detailing the concept of intelligence and different domains of intelligences. He said that the cognitive competence of the individual could be clearly and better described as the expression of a group of capacities and higher thinking skills called intelligence. Howard Gardner suggested seven basic intelligences, which were seven distinct ways of showing intellectual abilities, including verbal/linguistic, visual/spatial, musical, logical/mathematical, interpersonal, intrapersonal, and body/kinesthetic, after which three other intelligences were suggested: naturalistic, spiritual, and existential, including naturalistic intelligence (Mindy, 2005; Osmon & Jackson, 2002). He also mentioned that an individual possesses each of these capabilities to a certain level, but the individuals vary in the level, type of skill, and degree of mastery (Kırkgöz, 2010; Taaseh et al., 2014). Each type of intelligence operates independently of the other, and from here the individual can be of a high degree or low in one field, despite his intelligence. According to him, a learner's cognitive competence can be more precisely and accurately explained as the expression of a set of abilities and a more advanced reasoning ability known as intelligence. He also stated that while people have almost all of these abilities to some extent, they differ in the degree, type, and level to which they possess them (Taaseh et al., 2014). The theory of MI presented a challenge to the conventional view of intelligence, which recognises only one form of intelligence and employs only one method of teaching, depriving the majority of learners' chance to receive an actual education.

The eight intelligences suggested by MI theory are: linguistic intelligence, logical-mathematical intelligence, visual/spatial intelligence, musical intelligence, body-kinesthetic intelligence, naturalistic intelligence, interpersonal intelligence, and intrapersonal intelligence. The importance of the MI theory in education can be better understood by considering the suggestions of Chen et al. (2009). The following section illustrates their suggestions:

- Focusing on learners' intellectual capacities helps them to improve the learning and teaching processes and makes learning more effective.
- Instruction and teaching activities will be more enjoyable for both students and instructors when multiple intelligences are used.
- Improving teachers' performance through their use of various teaching strategies and techniques that differentiate learners in a manner that respects their unique differences.
- It considers the preferences, requirements, and interests of the students, enhancing the effectiveness of their learning.
- This theory aims to encourage each learner to employ their preferred form of intelligence while doing their homework.
- It focuses on the concept of understanding-based teaching, which makes sure that pupils develop their cognitive and analytical skills.
- The theory aids in utilising information technology and highlighting the significance of its role in education, in particular, the Internet.
- The theory makes the smart classroom model a reality.

### **Previous Studies Related to MI**

Numerous studies have been conducted regarding the inclusion of MI in the content of school textbooks. There are many examples of verbal, linguistic, and intrapersonal intelligences that are frequently evident in textbooks (Kırkgöz, 2010). Taaseh et al. (2014) investigated learners' preferred intelligence concerning the various types of intelligence listed in the textbooks is the study's secondary goal. The study's findings revealed that the most prevalent types of intelligence were verbal/linguistic, visual/spatial, and logical/mathematical. Interpersonal and intrapersonal were found in significantly lower ratios. There were no physical/kinesthetic, musical, or naturalistic intelligence discovered in the textbooks. Similarly, in 2015, Ashtarian and Ashtarian examined to what extent MI are reflected in the students' medical textbooks. The study reported that verbal intelligence was dominant in medicine textbooks. This is followed by logical and interpersonal, visual and bodily/kinesthetic intelligence. However, music and natural intelligences are not evident at all. Sibanda (2022) examined the "Grade 4 English First Additional Language" workbooks in South Africa and reported that the least identified intelligence was naturalistic intelligence and music intelligence had been completely ignored. Wattanborwornwong and Klavinitchai (2016) demonstrated that language used in textbooks, such as Chinese and English, cause discrepancies in MI.

Alsahhi (2020) explored MI in Jordanian science textbooks. According to the analysis, the three intelligences most frequently represented in the science textbook were verbal/linguistic, visual/spatial, and logical/mathematical, with a combined percentage of 73.3%. Interpersonal intelligence, intrapersonal intelligence, bodily/kinesthetic intelligence, natural intelligence, and musical intelligence made up the remaining 26.7% of total intelligence. Al-Qatawneh et al. (2021) examined how MI is addressed in the Arabic language textbook in Jordan. The study revealed that verbal/linguistic, visual/spatial and interpersonal intelligences were the most dominant intelligence.

The majority of existing studies related to MI are focused on textbooks. This is not surprising since textbooks have become the most used resource in the classroom. As a result, textbooks act as a conduit for instructors and students to communicate each other's learning objectives. The same cannot be said for MC since it is relatively new, and its existence is still in its infancy. According to Ruddy and Ponte (2019), the introduction of MCs is altering the landscape of higher education, and HEIs are working to implement and recognise MCs as a new educational journey. Henceforth, there must be an investigation into how MC can be effectively implemented in higher education institutions by ensuring quality teaching and

learning approaches to address this gap in the literature. In the context of MCs, MI awareness has not been explored. Understanding the inclusion of MI is pertinent because they not only have the potential to benefit learners but also for teachers to design effective MCs.

### **Past Studies Related to MC**

A review paper by Selvaratnam and Sankey (2021) brings together the existing research in MC to identify the gaps and areas of focus. It also includes some work done by micro-credentialing researchers that explicitly attempt to model the key relationships in the area. There are a number of concept papers related to MCs. Ghasia et al. (2019) investigated teachers' perceptions, levels of readiness, and implementation methods in Tanzanian universities. The findings imply that lecturers and students are optimistic that MCs will promote lifelong learning. A descriptive case study by White (2021) explored and critiqued the MCs from teacher professional development in an Australia setting. The study details the various design and development stages and presents some preliminary findings regarding the advantages and difficulties of establishing additional micro-credentials for the teaching profession.

In the local context, Che Ahmat et al. (2021) wrote a conceptual paper that gives a general overview of MCs as well as the difficulties and advantages of providing both national and international markets with MC certification in the form of digital badges. Lim and Hassan (2019) examined how MCs are recognised and acknowledged in the Malaysian higher education context. This article presents six broad suggestions for implementing MCs across the university's undergraduate programmes. It includes the platform, information pack, design, and assessment principles for MCs, as well as a description of the student's journey through each stage of the MC ecosystem. Finally, the article concludes by urging universities to create a strategic MC implementation plan to make sure that learners see digital badges as a way to showcase their accomplishments to future employers.

The studies discussed above indicate how rapidly and significantly research in MC has gained momentum and expanded in recent years. Unfortunately, there need to be more studies that investigate how educators design MCs in higher education institutions (Thi Ngoc Ha et al., 2023). The need to design and deliver content online in a flexible and accessible format that caters to the demands and habits of today's learners is crucial: to provide "21st-century learning that is networked, self-directed, project-based, and personalized" (Hickey, 2017, p. 2). There hasn't been much research on the pedagogical implementation, uptake, and sustainability of MCs as a disruptive technology for teaching and learning (Clements et al., 2020), particularly for HEI (Selvaratnam & Sankey, 2021). In retrospect, to the researchers' knowledge, no studies have looked into the multiple intelligences and MCs which we believe is crucial for adoption and implementation success of MCs.

### **Method**

Qualitative research is regarded as an effective approach to investigating knowledge from various points of view. Particularly, they make it possible for researchers to speak with participants and ask questions to get clarification on issues by probing (Creswell, 2009). It is better suited for studies that aim to comprehend rather than make predictions. Considering the exploratory nature of the study and the need to gain insights into educators' experience, a phenomenological approach is deemed pertinent. In the present investigation, we aim to delve into the experiences of educators pertaining to both multiple intelligences and micro-credentials, with the overarching objective of comprehending their authentic lived experiences.



## **Role of Researchers**

As educators in higher education, our goal is to enhance effective learning by incorporating technology-based learning. We recognize that modern educational standards give preference to the integration of technology such as micro-credentials into pedagogical practices. We recognize that modern educational standards give preference to the integration of technology such as micro-credentials into pedagogical practices. It is important to recognize that implementing such an approach necessitates extra preparation from instructors. This can be particularly challenging due to various constraints including time, space, and skill limitations. We firmly believe in the importance of diverse teaching methods, which is why we advocate for the use of technology-based learning. Our research was conducted with these principles and considerations in mind. To remain open to unexpected discoveries during our qualitative case study, it is crucial to maintain a flexible and inquisitive approach throughout the research process. This adaptability can be achieved through the use of open-ended questioning techniques. These techniques encourage participants to provide detailed and varied responses, allowing us to uncover unforeseen insights and viewpoints. Furthermore, sharing our preliminary findings with participants for validation or clarification creates a collaborative atmosphere that bolsters the reliability and accuracy of our findings. It also enables the incorporation of unanticipated perspectives into our research, enriching the overall outcomes.

## **Participants**

All 20 educators from University S, a public university in northern Malaysia, participated in this study. The university provides academic programmes in the social sciences and sciences at the undergraduate and graduate levels. In this study, convenience sampling (Creswell, 2009) was used to choose participants who would be able to speak about the research objective and be accessible to the research team for interviews. The researchers approached individuals or groups who are available and willing to participate in the study. The purpose of the study was clearly explained to the potential participants. They were informed on what was expected of them, the benefits of participation, and any incentives offered.

In this research, ethical principles were thoughtfully taken into account. Before commencing the study, participants received a thorough explanation regarding the study's nature. Students were provided with a consent form that outlined the study's objectives and the potential advantages of their participation. The consent form also explicitly stated that participating in the study posed no risks. The study specifically aimed to avoid any potential discomfort, embarrassment, or questions that could have an impact on the emotional well-being of the participants (Nuby et al., 2019).

Participants' demographic data included gender, age, subject taught, and number of previous experiences. A total of 28 educators ranging from 25-50, volunteered. There were twelve female and eight male participants. The researchers determined that the data from the 20 interviews had reached a point of saturation and that further interviews would not add any extra significance to the research. Based on the aforementioned standards, we chose 20 educators to participate in the study, ensuring they represented various academic disciplines. They were from courses related to mathematics, English language, geography, chemistry, anthropology, biology, and Malay literature. All of the aforementioned was done purposefully with the intent of boosting sample diversity and strengthening the reliability of the results. The study overview and sample interview questions were explained to the participants and their verbal consent was obtained.

## Data Collection

A semi-structured interview question was developed by the authors based on literature related to MI and MC. The purpose of the interview questions was two-fold: firstly, to identify the MIs the educators used in designing their MCs; and secondly, to identify reasons for including MI. Two experts in the field of technology and education validated the interview questions; they were provided with a rubric to evaluate the suitability of the questions. The interview questions were modified in response to the participants' responses, to delve deeper into their experiences. Each interview was transcribed verbatim. The interviewees received the transcribed information to check that it was an accurate and authorised recording of the interview.

Braun and Clarke's (2006) five-step thematic analysis guided the interview data analysis.

**Step 1: Familiarity with the data.** Line by line, a research assistant reviewed and reread the transcripts. This stage entails complete engagement with the data and a comprehensive review and multiple readings of transcripts, examining each line meticulously. The objective is to develop a profound comprehension of the material.

**Step 2: Creating initial codes.** The assistant coded transcripts to indicate important content and annotated them. This stage entails complete engagement with the data, achieved through a comprehensive review and multiple readings of transcripts, examining each line meticulously. The objective is to develop a profound comprehension of the material.

**Step 3: Identifying themes.** All annotated transcripts were thoroughly examined by a different research assistant who also looked for any discrepancies in interpretation. Any discrepancies in interpretation were resolved by the authors. They examined the codes to produce preliminary themes. During this phase, themes that surface from the coded information were identified. These themes represent recurring patterns of significance found throughout the dataset.

**Step 4: Reviewing themes.** The team may combine certain current themes or break some themes down into subthemes. The team iterated this approach until the thematic map met their expectations. Researchers assess the themes and contemplate whether they require further refinement, consolidation, or subdivision into subthemes.

**Step 5: Defining and naming the themes.** The group chose names that fully conveyed the theme's significance. The precise definitions are identified for every theme and select names that effectively communicate the theme's importance.

The interview questions for this study are: (1) what are the MI indicators used in designing your MCs? and (2) why did you use these MI indicators? Elaborate your answers with examples.

## Trustworthiness of Qualitative Data

To address the potential for researcher bias, the team implemented a range of strategies. Team members actively practiced reflexivity by acknowledging their own viewpoints and possible biases pertaining to the research topic. They regularly convened for team discussions to scrutinize assumptions and interpretations critically. During the data analysis phase, multiple coders were involved, and intercoder reliability checks were conducted to bolster objectivity. Preliminary findings were also shared with participants to validate interpretations, ensuring their perspectives were accurately reflected. To promote transparency and the potential for replication, thorough records of research procedures, data analysis, and decision-making processes were meticulously maintained. Through the adoption of these stringent research practices, the researchers aimed to present a comprehensive and dependable examination of

educators' adoption of multiple intelligences in micro-credentials within Malaysian higher education. The inter-rater reliability method developed by Miles and Huberman was used to evaluate the themes' degree of agreement and consistency. There was an agreement of 85% and the remaining 20% of the disagreements were sorted by choosing the themes that were most closely mirrored the items.

## Results

The analysis identified a number of themes related to MI. The themes were detailed in the following section using pseudonyms to protect the identity of the participants. Table 1 illustrates the frequency and percentage indicating the use of MI indicators. The qualitative data was read carefully, line by line, to determine to which category or categories it belongs, based on the chosen coding scheme. The software tool NVivo was used to assist with this process and the researchers checked manually for more accurate findings.

Generally, it can be observed that most of the participants have considered most of the MI indicators in designing their MCs. Only indicators related to visual/spatial/bodily kinesthetic and naturalistic intelligences were not considered by all the participants in designing the MCs.

**Table 1**  
*Frequency and percentage of MI indicators*

|            | Linguistic intelligence | Visual/Spatial intelligence | Interpersonal Intelligence | Logical-mathematical Intelligence | Music Intelligence | Bodily-kinesthetic | Naturalistic Intelligence | Intrapersonal Intelligence |
|------------|-------------------------|-----------------------------|----------------------------|-----------------------------------|--------------------|--------------------|---------------------------|----------------------------|
| Percentage | 100                     | 95%                         | 100%                       | 100%                              | 100%               | 70%                | 75%                       | 100%                       |
| Frequency  | 20                      | 20                          | 20                         | 20                                | 20                 | 14                 | 15                        | 20                         |
| PC1        | X                       | X                           | X                          | X                                 | X                  | X                  | X                         | X                          |
| PC2        | X                       | X                           | X                          | X                                 | X                  | X                  | X                         | X                          |
| PC3        | X                       | X                           | X                          | X                                 | X                  | X                  | X                         | X                          |
| PC4        | X                       | X                           | X                          | X                                 | X                  |                    |                           | X                          |
| PC5        | X                       | X                           | X                          | X                                 | X                  |                    |                           | X                          |
| PC6        | X                       | X                           | X                          | X                                 | X                  | X                  | X                         | X                          |
| PC7        | X                       | X                           | X                          | X                                 | X                  |                    | X                         | X                          |
| PC8        | X                       | X                           | X                          | X                                 | X                  | X                  | X                         | X                          |
| PC9        | X                       | X                           | X                          | X                                 | X                  | X                  |                           | X                          |
| PC10       | X                       | X                           | X                          | X                                 | X                  | X                  | X                         | X                          |
| PC11       | X                       | X                           | X                          | X                                 | X                  |                    | X                         | X                          |
| PC12       | X                       | X                           | X                          | X                                 | X                  |                    | X                         | X                          |
| PC13       | X                       | X                           | X                          | X                                 | X                  | X                  | X                         | X                          |
| PC14       | X                       | X                           | X                          | X                                 | X                  |                    | X                         | X                          |
| PC15       | X                       | X                           | X                          | X                                 | X                  | X                  | X                         | X                          |
| PC16       | X                       | X                           |                            | X                                 | X                  | X                  | X                         | X                          |
| PC17       | X                       | X                           | X                          | X                                 | X                  | X                  | X                         | X                          |
| PC18       | X                       | X                           | X                          | X                                 | X                  | X                  | X                         | X                          |
| PC19       | X                       | X                           | X                          | X                                 | X                  | X                  | X                         | X                          |
| PC20       | X                       | X                           | X                          | X                                 | X                  | X                  | X                         | X                          |

The emerging themes from the interviews are illustrated in the section that follows. Due to the complex and rich nature of qualitative data, some excerpts represent more than one theme and often intertwined with another excerpt.

## Verbal/Linguistic

The participants opined that verbal linguistic (slides, self-recorded videos, videos, audio) allowed content to be delivered effectively (PC2, PC4, PC5, PC6, PC18, PC20). This allowed learners to gain a better understanding of the topic/ idea being discussed in the lesson. According to PC1,

Verbal intelligence is the best way to disseminate knowledge and proven successful in classroom teaching... [Therefore, it is a] natural communication that allows students to feel comfortable and easy to influence learners. The reason to include verbal linguistic is to in line with the MCs goal to get the audience attention (PC1).

One of the benefits of including verbal skills in written forms is to make sure the audience receives clear information for a better understanding of the course. The written form, which is also considered verbal intelligence, "allows information to be conveyed to students effectively" (PC2). PC 5 felt that "lectures in oral form are supported by the written form." PC17 asserted that with verbal intelligence, "the students will feel the presents of the lecturers in the lessons regardless of time and location."

In conclusion, participants expressed their opinions regarding the effectiveness of using various verbal linguistic modalities such as slides, self-recorded videos, videos, and audio for content delivery. They unanimously believed that these methods facilitated effective communication of information leading to improved comprehension of the topics or ideas discussed in lessons. It was described as a natural form of communication that made students feel at ease and influenced their learning positively. Additionally, the inclusion of verbal linguistic modalities aligned with the objective of capturing the audience's attention.

## Logical and Mathematical Intelligence

Logical intelligence such as tables (PC1, PC6, PC8, PC11, PC13), charts (PC2, PC7, PC, PC13, PC14) and videos (PC8, PC17, PC19) were included to "make the course more interesting and to attract the attention of the learners." According to PC2, graphics "saves time and students remember the information much better." Similarly, P3 said that "graphs make students remember the information and reinforce the idea in a different form." P16 included "crosswords to self-test the students."

Overall, participants highlighted the use of logical intelligence tools, including tables, charts and videos with the aim of enhancing the course's appeal and capturing learners' attention. Graphics were effective in saving time and improving information retention among students. In short, participants acknowledged the value of logical intelligence tools in making the course more engaging and facilitating effective learning.

## Bodily/Kinesthetic Intelligence

Bodily/kinesthetic intelligence is the use of the body to express thoughts and feelings and to solve problems. Most participants agreed that bodily-kinesthetic intelligence had been used to design their MC. PC2 detailed that "body language is important to support the ideas being delivered in the lecturer. "Therefore, lecture videos with my appearance were uploaded." For PC5, "the combination of body language (lectures appearing in the videos) and our lecture will enhance the quality of the online lectures."

PC15 is a biology instructor who detailed that she used kinesthetic intelligence for effective teaching and understanding:

I do record some of my recordings in the trail. I will show the students some trails and walking with me virtually. There is a video for summative evaluation as virtual tour and walk along the trail and want them to write down the observation for a better understanding (PC15).

However, PC5 did not include my body or gestures in the MC and prefer to use pictures and other information related to the topic. P1 further added that in designing my MC, "I did not use my body to convey any information. Only writing" (PC8).

In sum, participants generally agreed on the value of incorporating bodily/kinesthetic intelligence into their instructional materials. PC2 emphasized the importance of body language to support the ideas conveyed in lectures, leading to the inclusion of videos featuring their appearance.

PC5 believed that combining body language (through appearing in videos) with traditional lectures would enhance the quality of online lectures. However, there were varying approaches among participants. PC8, for instance, preferred not to use their body or gestures in their instructional materials, relying solely on written information. PC1 also mentioned a preference for using only writing in their instructional materials, without incorporating bodily expressions. In summary, the participants in the study had different perspectives on the utilization of bodily/kinesthetic intelligence in their instructional materials, with some emphasizing its importance and others opting for alternative methods of conveying information.

### **Music Intelligence**

All participants used music in their MC so that the lessons are not "boring" (PC1, PC2, PC8, PC9). PC2 details that she used recorded music according to the situation. For example, "when I want to describe a sad situation (Literature studies) I will choose music that suits such situation." PC13 detailed how he used background music while designing his MC slides. "The entire video. Included music via iMovie applications. More towards instrumental music reflecting the sub-topics. For example, discussing matters regarding disasters, so the appropriate music was included while depicting / visualising the impact of the disaster." PC15 explained that:

Reading process more lively with music. I will also use music in between one short topic little music to separate. Pod cast. This particular music they know another topic. During the exercises and quiz. I like to include a different time so that the answering process is enjoyable. Different represent correct tone. Answering is not so boring. Short music. Complete the whole quiz and the quiz is completed (PC15).

The mood sets the tone of a lecture and as such, using certain rhythm, melody and music can breathe some "life" into the lecture. For example, PC15 gave examples and elaborated his experience:

For example, when I was preparing my MC course on communication skills, I used pop songs by Michael Jackson entitled "Pretty-Young-Things" and "Beggin" in between my slides. I reckoned that listeners would be jacked up

and stay connected with me when I inject some “vibe” into my MC course in the form of music (PC15).

In summary, the participants employed music strategically in their instructional materials to enhance engagement, set the mood, and prevent monotony, recognizing its value in making the learning experience more enjoyable and interactive.

### **Naturalistic Intelligence**

Natural intelligence is related to awareness of nature and the environment. Participants said that they used the natural environment because "its own magic that really attracts learners' attention. More authentic and emotional" (PC2). Similarly, PC13 said that "You really need site-specific visual for a better understanding of GIS implementation." PC19 stated that "it is pertinent to include naturalistic intelligence so that students are close to the context. For example, I recorded videos in a shopping complex with the permission of the owner to explain some retailing concepts (marketing)."

PC3 felt that "it is not necessary to use nature and the real environment in expressing ideas." PC13, who was a chemistry teacher, felt that "naturalistic experience is not needed in the topic."

The above experts discuss the importance of natural intelligence, which involves an awareness of nature and the environment, in educational settings. Some participants believe that using the natural environment in teaching is effective because it has a unique and captivating appeal to learners, making the learning experience more authentic and emotional. Others, like PC3 and PC13, have differing opinions, with PC13, a chemistry teacher, suggesting that naturalistic experiences may not always be necessary in certain topics.

### **Visual/Spatial Intelligence**

The participants stressed the importance of visual and spatial intelligences. According to PC15, the topic that used visual intelligences involves "simple diagrams. Acting as simple visual aids, diagram can serve as a 'point-reminder' that enables me to sail smoothly through my lecture with fewer words while helping to 'embellish' my MC courses." PC13 said it involves "charts, pictures, figures and illustration and short videos." This is to "just to make the content more interesting way." PC9, who is a chemistry lecturer, elaborated how she used phase diagram. In her words, "I use diagram to give detailed explanations about that specific topic." PC14 used "comic, video and timelines" in developing her content because "a picture (graphic) is worth a thousand words." PC3 used "videos for videos / graphs for visualizing flood incident, open burning, illegal timbering, etc."

The participants emphasized the significance of visual and spatial intelligences in their teaching approaches. The topics involving visual intelligences utilize simple diagrams as effective visual aids, allowing for concise lectures and enhancing their courses. Participants advocated the use of charts, pictures, figures, illustrations, and short videos to make the content more engaging.

### **Interpersonal Intelligence**

Among the kind of project or pair work implemented when designing the MCs were *forums* (PC7, PC8, PC10, PC11) and *group work* (PC4, PC5, PC12, PC13). PC7 stated that "I will assign the students into a small group and challenge them to solve some questions and ask them to make a video to explain and solve the task to encourage them to think critically" (PC2):

PC18 includes a large amount of task-based and problem-based learning for her students. She explained that:

There will be tasks assigned to a group member. Each team consists of three members. The three members are to become leaders for three different tasks in the assignment. Such a task is for them to collaborate to enhance their leadership and critical thinking (PC18).

However, this is not the case for PC16, who explained that "I did not design any project work or pair work in my MC." PC16 felt that "if the subject matters are societal or community-based, incorporating project work, task-based learning and group work can heighten the quality of a MC."

The text discusses various approaches to project and pair work in the context of designing the micro credential. Some instructors incorporate forums, group work, and task-based learning to encourage critical thinking and leadership skills among students. Students were also assigned to small groups to solve questions and create explanatory videos. In contrast, PC16 did not include any project or pair work in their micro credential but believe that such methods can enhance the quality of the curriculum when dealing with societal or community-based subjects.

## Intrapersonal Intelligence

Participants revealed that intrapersonal intelligence was related to "quizzes" (PC1, PC5, PC6) and "Kahoot" (PC1, PC5, PC18, PC19) where students are involved in self-assessment. Students are also instructed to "prepare short report" and "describing landforms and environmental deformation" (PC13). PC4 instructed students "to make a video to explain and solve the task given." PC19 gave students a checklist for self-assessment and peer assessment to understand both their own and their peers' strengths and weaknesses. Figure 1 illustrates the checklist used by PC19.

**Figure 1**  
*Checklist for Assessment*

|   |         |                                 |
|---|---------|---------------------------------|
| <b>Self and Peer Evaluation</b><br><b>(Leadership and Teamwork)</b> |         | Academic Year: <b>2021/2022</b> |
|   |         | Revision:                       |
| Name:   |         |                                 |
| Matric No.:   | Course: |                                 |
| Assessment for: <b>ASSIGNMENT 1</b>                                 |         |                                 |
| Group Name : _____  |         |                                 |
| Leader : _____  |         |                                 |
| Member 1 : _____  |         |                                 |
| Member 2 : _____  |         |                                 |

**Instruction:**

Rate your own and each of your team members' performance on the following leadership and team skills. Please be as honest as possible. This evaluation is confidential. Please do not reveal it to your team members.

**Part A: Leadership**

**Rating Key:**

Strongly Disagree = 1; Disagree = 2; Neither Agree nor Disagree = 3; Agree = 4; Strongly Agree = 5

| No | Item  | Self/Member 1/Member2 |
|----|---|-----------------------|
| 1  | Disseminate tasks fairly and accordingly  |                       |
| 2  | Communicate clearly (verbal, non-verbal and via email/phone/text/social media etc.) |                       |
| 3  | Set reasonable goal and expectation for what the team members can do                |                       |
| 4  | Manage conflicts among the team members efficiently                                 |                       |

## Discussion

Almost all types of MIs are evident in the MCs that were designed by the participants in this study. Such an outcome is plausible due to the affordances of technology that allow educators to integrate most of the MI indicators easily and effectively. The educators grasped the power of technology and utilized this knowledge to design effective MCs to energize students' thinking. They have reconsidered most of the MI indicators to account for a variety of teaching and learning techniques. By doing so, educators have tried to implement conditions under which learners have a better chance to learn (Parchoma et al., 2020, p. 13).

Many previous studies have focused on the inclusion of MI in school textbooks (Ashtarian & Ashtarian, 2015; Wattanborwornwong & Klavinitchai, 2016) and demonstrated that not all MI could be used in textbooks. However, the current study has indicated that the eight MI indicators can be included in designing the MCs. It can be a possible reason as to why Ralston, (2021, p. 95) highlighted that "micro-credentialing contributes to the decline of the traditional degree. It paves the way for the total substitution of degree programs with micro-credentials..."

Educators must assess how various intelligences might effectively convey ideas and knowledge to learners (Armstrong, 2000). According to Abenti (2020), MIs are the best technique to instruct and engage with students in a diverse and modern learning environment. Due to individual differences, educators need to have unique teaching approaches and not all learners have the same learning preferences. According to Safranji (2016), educators can always take advantage of MIs and integrate them into their teaching approach, assignments, and other resources, in order to use MIs while learning. This is pertinent to stimulate all kind on intelligence in their learners. Many educators are unaware of the various intelligences, skills, and preferences of their students. They keep teaching in the traditional "one size fits all" way. Therefore, MCs with appropriate planning and MI indicators allow educators to design their teaching by tapping into various kinds of intelligences.

All the participants agreed to the importance of linguistic intelligence. This finding may be because linguistic intelligence is a means of knowledge building. This finding could be explained by the fact that linguistic intelligence is a means of effective communication between educators and their students to comprehend topics that lead to the development of their inquiry skills to solve problems and issues that they will face in their life. According to the interviews, the themes related to linguistic intelligence indicated the advantage of using verbal intelligence because ideas were conveyed effectively, and oral form was supported by written form. Musical intelligence was absent in the results of other studies (Ashtarian & Ashtarian, 2015; Taaseh et al., 2014) The logical/natural intelligence indicators used by the participants in this study are said to give an actual impact of the idea being discussed for effective learning outcomes. This type of learning has also been referred to as "organic" learning (Marek & Wu, 2011). Also, participants have voiced out the use of logical and mathematical intelligences for interesting content delivery, saving time, attracting attention, and remembering ideas.

Based on the study's findings, the educators tried using 21st-century learning strategies when creating their MCs. The kind of interpersonal intelligence and intrapersonal intelligence mentioned by the participants were related to active learning, where participants prioritise collaboration, critical thinking, creative learning, and communication and allow the application of 21st century learning skills which are fundamental in effective learning process.

The participants have played a crucial role in producing quality content when designing the MCs. MC allows educators to practise creative thinking skills based on the students' multiple intelligences. The 21st-century learning skills require educators to emphasize collaboration, critical thinking collaboration and communication and integrating higher-order thinking (HOTS). Educators should develop and implement this type of varied learning task



that can engage students in meaningful learning experiences (Devlin & Samarawickrema, 2010). According to Riyanti et al. (2019), interpersonal intelligence is also known as social intelligence and it teaches students how to lead, manage, and resolve conflicts while interacting with others. The findings of this study are similarly acknowledged by Noh et al. (2021) that teachers needed to adopt a design-thinking mindset to help their students become more innovative and creative thinkers in the context of Education 4.0. This mindset included user-centred design, empathy, collaboration, optimism, experimentation, prototyping, and process mindfulness. Such an initiative would (i) break the monotony in virtual teaching and learning environment; (ii) reduce fatigueness and exhaustion of learning; (iii) enable active learning; and (iv) enable self-directed learning methods. We can conclude that educators in this study have attempted to provide learning opportunities that allowed learners to communicate, collaborate and think critically and creatively to acquire knowledge.

On the contrary, the findings also indicated that not all participants incorporated MI in designing an effective MC. The reasons for not integrating naturalistic intelligence, kinesthetic intelligence and visual/spatial intelligence by some of the participants imply that the educators demonstrate a lack of understanding of MI indicators. The reasons highlighted by the participants were that the subject matter was not relevant to their courses. The primary goal of any approach or pedagogical practice is to create environments that facilitate learning and problem-solving in the actual world rather than focusing primarily on the subject content (Kim et al., 2018). This may also imply that educators lack creativity, effort, and the ability to conceptualize MCs for teaching and learning. The authors believe with the proper comprehension of MCs with workshops and training, educators would consider all MI indicators when planning and designing MCs.

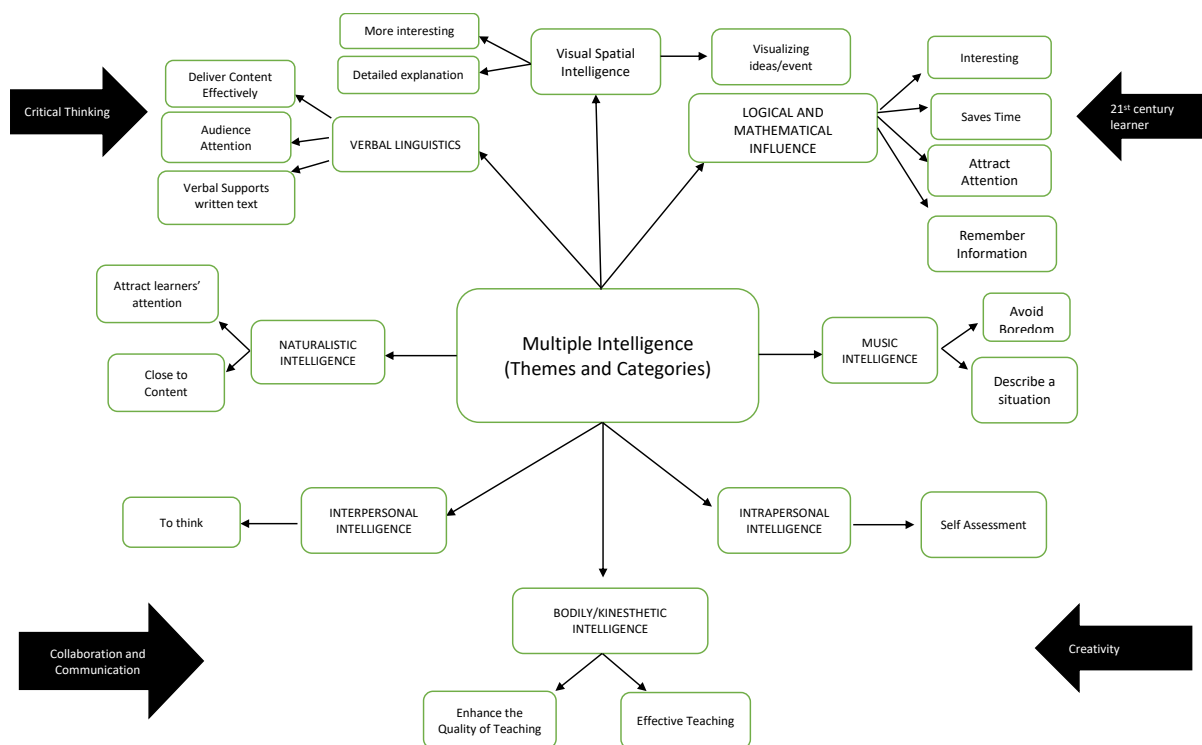
### **Pedagogical Implications**

Instead of classifying students according to their levels (advanced, average, or low) and providing them with the appropriate attention, educators can use the students' strong points to encourage them to achieve their learning outcomes. The MI principle can be used to design tasks and activities suitable for students who arrive at class with their own unique set of skills. Therefore, if educators are equipped with such knowledge, they should be able to design MCs that engage learners and motivate them to learn in ways that will continue to have an impact on the quality of teaching. According to Wheelahan and Moodie (2021) MCs emphasize framework and standardisation. Based on the findings, we were able to create a model that combines MIs and 21st-century learning for developing MCs in higher-education institutions. Using the model, the educators will be equipped with the knowledge of MIs. Educators are then guided on integrating 21st-century learning skills in the respective subjects/courses emphasizing critical thinking, creative thinking, collaboration, and communication.

Higher education institutions will “no longer instruct students predominantly on content, but also news literacy, written and oral communication and career-specific skills and techniques, and provide networking and knowledge advancement opportunities” (Wolfe & Andrews, 2014, p. 210).

The suggested model was conceptualised using the data from this investigation. This model can help academics in designing your MC, although they are not yet conclusive. Future research could potentially test them out and fully examine the results. According to Stefaniak and Carey (2019), problems with HEI can frequently be traced to challenges with usability, applicability, and a lack of knowledge of its purpose and value. Therefore, the absence of a framework to guide and validate technology initiatives highlights the incompetence of such efforts.

**Figure 2**  
Pedagogical consideration while designing micro-credentials



In defining and identifying the MI indicators for MCs, an important question that should be considered is: what are the sources and technology tools that should be used to design effective MCs? Table 2 can be considered as a guideline by educators when they plan to develop MCs in an MI-situated framework.

**Table 2**  
Guidelines for educators to design MCs based on MIs

| Tools  |
|--|
| <p><b>Verbal/Linguistic Intelligence</b></p> <ul style="list-style-type: none"> <li>• Slides</li> <li>• Self- Recorded Videos</li> <li>• Audios</li> <li>• Written text</li> <li>• You tube links</li> </ul> |
| <p><b>Logical and Mathematical Intelligence</b></p> <ul style="list-style-type: none"> <li>• Tables</li> <li>• Charts</li> <li>• Videos</li> <li>• Graphics</li> <li>• Crosswords</li> </ul>                 |
| <p><b>Visual /Spatial Intelligence</b></p> <ul style="list-style-type: none"> <li>• Comics</li> <li>• Videos</li> <li>• Diagrams</li> </ul>  |

|  |
|--|
| <ul style="list-style-type: none"> <li>• Pictures</li> </ul>   |
| <b>Bodily Kinesthetic</b> <ul style="list-style-type: none"> <li>• Use their body to present ideas (self- recorded videos)</li> </ul>  |
| <b>Musical Intelligence</b> <ul style="list-style-type: none"> <li>• Pop Songs</li> <li>• Recorded Music</li> <li>• Background music</li> </ul>  |
| <b>Naturalistic Intelligence</b> <ul style="list-style-type: none"> <li>• Real environment</li> </ul>  |
| <b>Interpersonal Intelligence</b> <ul style="list-style-type: none"> <li>• Project Based</li> <li>• Task based learning</li> <li>• Forums</li> <li>• Project Based learning</li> </ul>   |
| <b>Intrapersonal Intelligence</b> <ul style="list-style-type: none"> <li>• Quizzes</li> <li>• Kahoot</li> <li>• Padlet</li> <li>• Short Report</li> <li>• Videos for self- assessment</li> <li>• Peer Assessment</li> <li>• Checklist</li> </ul> |

### Conclusion

This study is timely and offers a worthwhile perspective for higher educators in designing and planning their MCs. The development of “micro credentials need to be in the service of these big ideas, not as a big idea itself.” (Brown & Mhichil, 2021, p. 250). Gardner contends that every individual is born with a different level of intelligence and is unique in their way. Each learner's potential intelligence can be discovered by emphasizing all of his/her intelligence, that will also enable them to learn. It is hoped that by demonstrating the necessary elements that need to be integrated into designing MCs, educators will be able to engage learners with a more meaningful and impactful learning environment. However, the study is not without limitations. The findings reflect a specific context, Malaysia, and the findings cannot be generalized to other contexts. Therefore, future studies should focus on large-scale surveys in Malaysia as well as other countries.

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### Author Note

Mohd Elmagzoub Eltahir is an Associate Dean and Associate Professor of Educational Technology, Education Department, College of Humanities and Sciences at Ajman University. Dr. Eltahir research interests include, e-Learning, Educational Technology, Blended Learning, and Multimedia in Education, and has presented and published most of his papers at Professional International Conferences and Refereed scientific journals. He teaches Educational Courses in Undergraduate and Postgraduate Programs.

Nagaletchimee Annamalai (corresponding author) received a Ph.D. degree in teaching English as a second language (TESL) from the Universiti Sains Malaysia. Currently, she is a Senior lecturer at School of Distance Education, Universiti Sains Malaysia. She is aware of the current values, preferences, and needs of digital natives and 21st-century learning classrooms. She has published her articles in national and international journals. Please direct correspondence to naga@usm.my.

Samer H. Zyoud received his M.Sc. degree in Physics from University of Baghdad, Baghdad, Iraq, in 2003. Currently, he is a Senior Lecturer at College of Humanities and Sciences, Ajman University, Ajman, United Arab Emirates and PhD Student at Universiti Sains Malaysia, Penang, Malaysia. His research interests include blended learning, educational technology and online learning. He is the author/co-author of more than 60 articles published in international journals.

Dr. Najeh Rajeh Al-Salhi is an Assistant Professor in the Department of Education at the College of Arts, Humanities, and Social Sciences at the University of Sharjah. He holds a doctorate degree. Certificate in Curriculum and Science Methods. He also worked as a research associate at the College of Humanities and Humanities at Ajman University and worked at the Humanities and Social Sciences Research Center and the Nonlinear Dynamics Research Center (NDRC), Ajman University, Ajman, United Arab Emirates. He also worked as a science and chemistry supervisor at the Ministry of Education in Jordan. He published most of his research in specialized international conferences and scientific journals.

Bilal Zakarneh is an Associate Professor and Head of the Department of Foreign Languages at Ajman University, UAE. With a specialization in English language studies, his research interests encompass Teaching English as a Foreign Language, Discourse Analysis, English Literature, Online Teaching, and English for Specific Purposes.

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