Developing Synchronous Online Teaching Practices through Emotion Contagion Theory using ADDIE

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ARTICLE INFO	ABSTRACT
                         	Student engagement is a critical factor in online learning. The higher the engagement, the more effective time and effort students spend pursuing their goals. An increasing volume of research indicated that engagement is malleable through effective pedagogy. While most research focused on course structure and content, teaching and learning activities and the teacher's role, this study aimed to add a human touch to online elementary learning since emotional engagement is the most influential factor in elementary education. The objectives of this study were to develop teaching practices in synchronous online sessions at elementary levels through Emotion Contagion Theory. The synchronous online teaching practices were developed based on the findings of preliminary studies of Generation Alpha's online learning experience and the factor of emotional engagement. The development was conducted using the ADDIE Instructional Design Model, and Emphatic Concern, Emotion Contagion, and Communicative Responsiveness Model. As synchronous online learning is the facet of online learning, this study aimed to provide a guideline for elementary online educators to serve as a part of effective online education targeted at Generation Alpha, aged 7-12. Both descriptive qualitative and descriptive quantitative analyses were conducted. The development process adhered to the ADDIE model's five steps, encompassing Analysis, design, development, implementation, and evaluation. (2) The content expert's validation demonstrated agreement. The overall user's questionnaire responses averaged into the "good" category. Overall, users express that the module is qualified and easily comprehensible. Users suggested to provide more examples of non-verbal cues. Experts proposed a revision of the background colour to make it more interesting, add more details on how to create a genuine smile, and develop the teaching practices into a tangible synchronous teaching kit to increase its accessibility.

1. Introduction

Emotional or affective engagement refers to students' interest, enjoyment, support, belonging, positive attitudes, and affective reactions toward school, learning, teachers, and peers [1-3]. Emotionally engaged students are intrinsically motivated to achieve learning outcomes and

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participate in class [4]. Emotional engagement in online learning was more influential in predicting learning satisfaction than cognitive and behavioural engagement [5-7]. Research discovered a strong correlation between emotional engagement, academic success [8,9], and students' performance [9, 10]. Meanwhile, some studies asserted that emotional engagement was the most influential predictor in learning persistence [11], student retention [12], and the outcome of attitudes such as motivation and satisfaction [13-15]. Emotional engagement can be triggered by various factors, including the quality of the learning environment, the instructor's teaching style, and social interactions between students, and is primarily affected by instructional strategies [16].

The sudden shift in the education format during the COVID-19 pandemic highlighted the need for knowledge of many teachers when conducting online classes, precisely synchronous sessions. A study Barbour [24] asserted that synchronous online learning is more teacher-centred than student-centred. Teachers are essential in giving students a satisfying experience to sustain online learning motivation [37] and involvement. However, the findings of many studies indicated that teachers were under-prepared with strategies to lesson preparation [17], project presence, develop relationships, and foster interaction [18]. The problems of online engagement were exacerbated by the lack of research and the ignorance of educators aided by a lack of relevant knowledge. Most teachers needed to prepare to engage and serve in online teaching and learning settings [19-21]. The educators were learning while conducting instructional activities as they needed to gain experience in an online setting [19,20,22,23]. As there were limited studies about online engagement at the K12 level [24-27], educators were forced to adopt non-research-based practices in emergency remote teaching during the pandemic in 2019, such as delivering instruction in one-way communication without providing any support, adopted lecture-based and teacher-centred approach in online learning [28], only delivered outdated learning video which downloaded from YouTube as the primary source of instruction [29], etc. Research has been done before that highlights teachers need more effective techniques to check student presence and understanding. [30,31]. The most used instructional method was question and answer (Q&A) [29], as it was the easiest way for teacher to measure students' understanding. The most frequently asked question in online learning was, " Do you understand the content?" [32]. Many studies indicated that inappropriate and ineffective online teaching practices, strategies, and teachers' support were the culprits of low online engagement [2,17,33-36]. Nevertheless, online engagement could be more malleable and ductile through effective and appropriate teaching practices [37].

In education settings, teacher's emotions could affect students' emotions in class [38]. Studies indicated that teachers' emotions can be passed to students [39,40]. Students can unconsciously "catch" teachers' emotions through different interactions with students in the teaching and learning process. It can spread from person to person or from person to a group of people [41,42] and is reflected in showing a similar facial, vocal, or postural expression, as well as similar neurophysiological and neurological reactions, and results in behavioural, attentional, and emotional synchrony [42,43] towards the interacting party. Based on Emotion Contagion Theory [42], emotional contagion is automatic, unintentional, uncontrollable, and largely unconscious.

Hence, we hypothesized that if the instructor displays a positive attitude and expresses emotions such as happiness, and enthusiasm, joy and engaged emotionally, the students receive the stimulus of the instructor, the autonomous nervous system response and neural representation of the affective state of the observers would be activated through instructors' facial expression, tone, valence of voice, gesture, attitude, etc. In the circumstances, the student would react and respond to the stimulus by mimicking the positive emotion presented by the instructor and experiencing the emotions of happiness, enthusiasm, joy and engagement.

Since research on online learning at elementary levels is limited [24-27], most of the teaching practices were not tailored to children's needs, this study aimed to develop teaching practices through Emotion Contagion Theory using ADDIE instructional model to foster emotional engagement in synchronous online learning at elementary levels.

2. Methodology

The synchronous teaching practices was developed using the ADDIE instructional design model. ADDIE instructional model was first introduced in the 1970s. ADDIE assists in pinpointing a starting point for a project, providing valuable guidance for new instructional designers who lack experience in the field. As one of the most widely acknowledged and utilized instructional design models [44, 45], ADDIE maintains consistency and applicability across diverse fields. The ADDIE model has five steps: Analyze, Design, Develop, Implement, and Evaluate. The ADDIE model employed in this study was presented in Figure 1. Each step of development was discussed in the following sub-section.
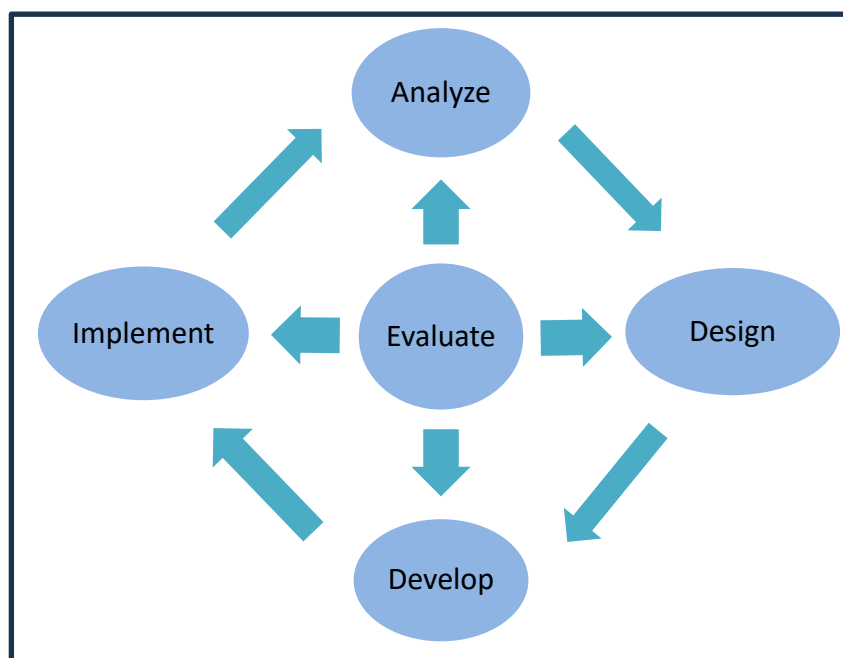
Fig. 1. ADDIE instructional model

2.1 Analyze

The Analyze phase is the foundational stage in instructional design, where the researcher identifies and explores potential solutions for a problem. In this study, the analysis was conducted to understand the existing online learning experience among elementary online learners, their current problems, and their learning needs in synchronous online learning. There were two preliminary studies in this phase. The first preliminary study investigated elementary students' online learning experiences. The first preliminary study addressed teacher's roles, issues, and practices, as well as students' feelings and emotions in online classrooms from the perspectives of Generation Alpha, aged 9-12. The second preliminary study explored engagement and disaffection in synchronous online learning. Simply put, what makes them engage in online learning and disengages them? The

outcomes encompass instructional goals and a list of tasks slated for instruction, serving as critical inputs for the subsequent Design phase.

2.2 Design

The Design phase involves creating a blueprint for the instructional materials and specifying the learning objectives, content, and activities. The researcher began the Design phase with a systematic search in the literature from 2015-2023 using the scoping review method. The scoping review aimed to summarize teaching practices in synchronous online learning in the literature. This review was conducted based on the framework outlined by a study [46]. There were five critical phases in reviewing process, namely (1) identifying the research questions; (2) identifying the relevant studies; (3) study selection; (4) charting the data; and (5) collating, summarizing and reporting the results. A systematic search was conducted in three databases, namely Scopus, ScienceDirect journal, and Web of Science. The keywords that were used to search for the literature were "synchronous" and "teaching practices" (The exact keywords used were Synchronous AND "teaching practice").

2.3 Develop

The Development phase extended from both the Analyze and Design phases, aiming to produce lesson plans and instructional materials. Combining the data collected in Prelim study 1 & 2 and the findings of scoping review, the researcher integrated emotion contagion elements (such as facial expression, vocal expression, and gesture) into the practices to develop appropriate synchronous online practices for elementary students. As the adopted theory contained psychology elements, the integration of the elements was validated by some psychology experts. The mapping of development through Emphatic Concern, Emotional Contagion, and Communicative Responsiveness were presented in Figure 2.
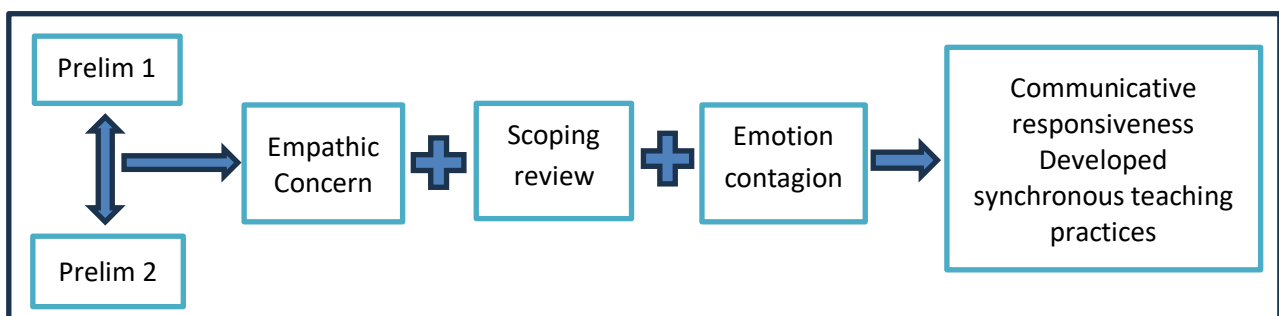
Fig. 2. Development through Empathic Concern, Emotion Contagion, and Communicative Responsiveness Model

2.4 Implement

The Implementation phase involves the tangible presentation or delivery of the instruction. The objective of this phase is to deliver instruction effectively and efficiently. In this phase, it is essential to enhance teachers' comprehension of the material, facilitate their mastery of objectives, and ensure knowledge transfer to set goals.

2.5 Evaluate

This phase gauges the effectiveness and efficiency of the instruction. Evaluation is an integral aspect that should occur consistently throughout the entire instructional design process—within phases, between phases, and post-implementation. Evaluation can take the form of either formative or summative. Formative evaluation is an ongoing process during and between phases, intended to refine the instruction before the final version is implemented. On the other hand, summative evaluation typically happens after the final version of the instruction is implemented and assesses the overall effectiveness of the instructional design to make decisions about the instruction. This study only implemented formative evaluation. Meanwhile, following the ADDIE model, formative evaluation is systematically carried out at each stage of the development process.

3. Results and Discussions
3.1 Analyze

The result of case studies in the Analyze phase exhibited the real situation of online learning among contemporary elementary students. The themes of elementary online learning experience emerged were teacher, community, course, technology, effectiveness, and challenges. In personal interviews, when children mentioned their online learning experiences, they mostly focused on expressing their likes and dislikes about teachers, such as which teacher they had the best learning experience with or whose class was the most boring. More in-depth questioning revealed that contemporary children's preferences for subjects or learning experiences are entirely dependent on their preferences for teachers. In the presence of subjects or teachers which they are interested, they tend to be more active, autonomous, and willing to complete assignments and tasks. On the contrary, if they meet a teacher they don't like, most of the time they choose to stay quiet and turn off the microphone or webcam. One of the interviewees said that he often uses the problem of network connection to avoid all questions, and even pretends that the internet is disconnected and presses the button to leave the online class classroom.

On the other hand, these interviewed children have all experienced online classes during the pandemic until now. They believe that today's online teaching has made great progress. During the pandemic, many teachers, including school teachers, just focused on imparting knowledge, reading the presentation slides rigidly, and repeating the same content over and over again. But today's online course teachers would not teach in a vivid way, but design interesting online activities, such as quizzes or games to help them master knowledge. They preferred online teachers who incorporated classroom activities during online learning. Having experienced online learning during the pandemic, respondents said they are familiar with various online learning operations, such as live streaming platforms, online learning systems, equipment, etc. They all have the conditions and equipment suitable for online learning. Nowadays, they rarely face network outages, understand the importance of good quality microphones and webcam for online learning, and they all have laptops for online learning. They only use tablet or smart phone when they have to go out during the class hour. Notably, the study's findings may differ from others due to the diverse socio-economic backgrounds of the participants.

Overall, half of the students found online learning to be very effective, while the other half felt that physical classes would help them more than online learning. Children who think online learning is effective feel that online learning helps solve the transportation and time problems faced by parents when transporting children. At the same time, they have the opportunity to come into contact with excellent online teachers from all over the country. Many online studies also offer free

trial classes, which gives them the opportunity to meet classmates from different backgrounds. In addition, they also believe that when learning online, it is easier for teachers to focus on imparting skills and knowledge, unlike in physical classes where there are many distractions, such as dealing with students' discipline issues. As for those respondents who believe that online learning is ineffective, they believe that online learning has deepened their vision problems. They wear spectacles because they spend a lot of time in front of a computer screen. In addition, since they are studying at home, they somehow lack discipline and often browsing videos, messaging friends, chatting or even playing games.

The themes and coding related to the factors of engagement and disaffection in synchronous online learning were: a teacher who is friendly, fun, interesting, punctual, caring, does not get angry quickly, and does not curse. Students held a preference for teachers who exhibited positive and engaging qualities. They appreciated teachers who always smiled and made jokes, creating a positive classroom atmosphere. They like teachers who can share practical skills and tips, but not wordy. They also valued teachers who showed genuine concern and care, as well as those who were willing to listen to their problems. Patience in explanation, especially when students struggled to grasp the content, was highly regarded. Additionally, they liked teachers who offered praise and encouragement, creating a supportive and motivating learning environment.

3.2 Design

As the result of scoping review in the literature, a total of 185 articles were found related to synchronous online teaching practices. After title and abstract screening, 63 articles were found related to the research question. All studies were checked to ensure that the studies focused mainly on online or remote learning. Those studies which involved face-to-face interaction as part of their study setting were excluded. In the end, 25 articles were reviewed through full-text access. There were 26 synchronous online teaching practices found in the process. After another round of review, five teaching practices were excluded as the study emphasised blended synchronous learning, which involved face-to-face interaction. The teaching practices, the authors, the year of study and their population and setting were listed in a table carefully. Twelve synchronous online teaching practices were scoped from the literature. Based on the Community of Inquiry Model in online learning, all the teaching practices were coded and categorised under three themes: design and organisation, direct instruction, and facilitate discourse.

Under design and organization category, there were four synchronous teaching practices, which were adopt professional and friendly tone to add warmth and humanity, reinforce the use of webcam, organize classroom activities, and wear appropriate clothing or props. Besides, there were five synchronous teaching practices categorized under direct instruction, such as incorporate non-verbal cues, arrange timely short break, allow interruption and adopt interactive approach when delivering instruction. For facilitate discourse category, there were four synchronous online teaching practices, including use students' name, amplify participation, adopt chat-based interaction, and create sense of humour. The synchronous online teaching practices resulting from scoping reviews are summarized in Figure 3.
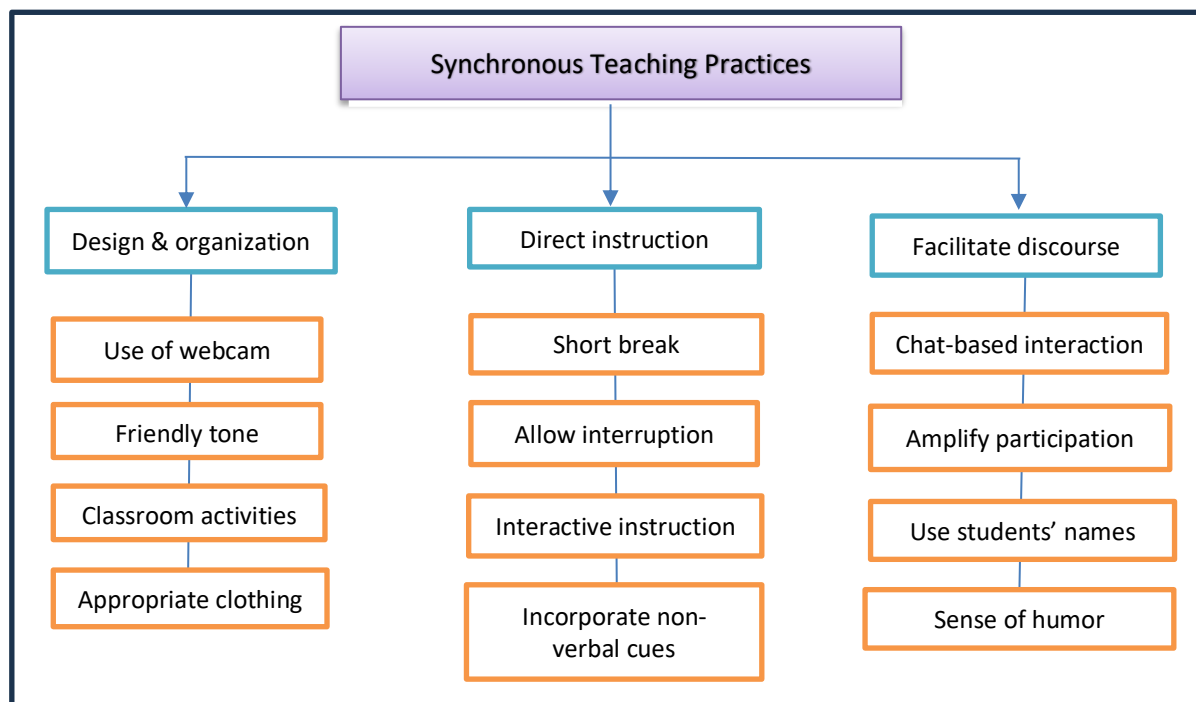
Fig. 3. Summary of synchronous teaching practices through a scoping review

3.3 Develop

The product resulting from this research and development is teaching manual for synchronous online teaching at elementary levels. The developed teaching manual contained a document of 20 pages in WORDS and a slide presentation. The developed teaching manual contained a cover, introduction, table of contents, and teaching practices arranged under four categories (design and organization, direct instruction, facilitate discourse, and conflict management).

There were four synchronous online teaching practices categorized under design and organization, namely greet and welcome students with smile, adjust teacher projection on the screen, use emoji or hand signs to express emotion, visit breakout room to amplify teaching presence, and start and finish on time. The details and examples of each practice were presented in video respectively. In Part Two (direct instruction), there were four teaching practices, which were incorporate non-verbal cues, pause frequently to allow interaction, chat informally during break time instead of turn of webcam, and invite questions. In Part Three (facilitate discourse), there were four practices, such as address students' name, acknowledge contribution using non-verbal cues, create sense of humour, and adopt informal conversation. Lastly, four teaching practices were developed and categorized under conflict management. Through the interview with elementary online learners, the researcher noticed that students expected a patience teacher. However, there were many unforeseen issues which might occur since synchronous online session is a real-time communication. The way of online teacher handled these conflicts and problems were observed by all other learners in the online classroom. If teacher reacted negatively to the situation, the negative emotions can be transferred among the group. Hence, the researcher suggested four practical conflict management practices for online teacher to deal with the common issues in synchronous online sessions. The suggested conflict management practices were developed based on empathic concern, emotion contagion and characteristics of Generation Alpha in the literature.

The teaching manual was developed using PowerPoint Presentation as it is more accessible for elementary-level teachers. Since these were teaching practices in synchronous online session, the researcher presented them in a video format to be easily understood. The videos were developed using Filmora WonderShare, Adobe Photoshop, and Murf A.I. voice generator. The video contained various examples and emotion contagion elements that could be adopted in synchronous online teaching to foster emotional engagement in Generation Alpha, aged 7-12.

3.4 Implement

The developed teaching manual was implemented and delivered to some experts and users for testing in the implementation phase. The expert panel consisted of three experts of educational psychology in academia and industry. The developed teaching manual was also presented to technical expert and five online teachers. All the respondents received the Word file document and presentation slides. They were also provided with an overview of the study and an evaluation form to gain their feedback to make revisions to the product. The data collection method was a three-point Likert scale survey, where one disagrees, two neutral, and three agree. All the respondents were given 30 days to review and revise the teaching manual before giving feedback.

3.5 Evaluate

There are seven assessment items on content. The result of the analysis based on the mean score of all the aspects is 2.86, which near to agree category. It means that the module of the development research model has a range of suitable qualifications. Qualitatively, through the opened questionnaire, experts on content suggested providing details of how to create a genuine smile and how a fake smile differs from a genuine smile. The result of the validation of experts is shown in Table 1:

Table 1
Assessment of experts on content

	Items	Mean score	Agreement
1	Appropriateness of intervention on elementary online teachers	3	Agree
2	Appropriateness of content within an elementary online setting	3	Agree
3	Appropriateness of the structure of the content	3	Agree
4	Appropriateness of organization of the content	3	Agree
5	Appropriateness of employment of concept in synchronous online teaching	2.67	Neutral
6	Clarity of learning objectives	2.67	Neutral
7	Conformity of study objectives and intervention	2.67	Neutral

There are four assessment items on teaching approaches and implementation methods. The result of the analysis based on the mean score of all the aspects is 3 with the agreement category. It means that the teaching approaches and implementation methods are suitable for qualifications. One of the experts suggested developing a tangible teaching kit to make it easier for reference. The result of the validation of experts is shown in Table 2:

Table 2
Assessment of experts on teaching approaches and implementation method

	Items	Mean score	Agreement
1	Clarity on guidelines in synchronous online teaching	3	Agree
2	Clarity on implementation approaches	3	Agree
3	Alignment of intervention approaches and practices	3	Agree
4	Appropriateness of tools in the intervention (video, images, application, etc.)	3	Agree

There are six assessment items on design and media for the part of media design. The result of the Analysis based on the mean score of all the aspects is 3 with the agreement category. It means that development research design is based on various suitable qualifications. One of the experts on design and media suggested changing the home button to a more attractive one. In contrast, another expert suggested changing the background colour to create an active atmosphere to match the various emotional contagion elements in the product. The result of the validation of experts is shown in Table 3:

Table 3
Assessment of expert on design and media

	Items	Mean score	Agreement
1	Functionality of the buttons	3	Agree
2	Appropriateness of language used	3	Agree
3	Clarity of instruction and user guidelines	3	Agree
4	Appropriateness of format and layout	3	Agree
5	Consistent use of spaces and terms	3	Agree
6	Accuracy of placement of charts, tables, or image illustration	3	Agree

Besides, the developed teaching kit was also evaluated by five online teachers (users). There were six assessment items on the functionality and usability of the development. The result of the analysis based on the mean score of all the aspects is 3 with the agreement category. It means that the functionality and usability of the development are in the range of good qualifications. One of the users suggested adding details on the type of non-verbal cues and examples (facial expressions, body language, gestures, posture). The result of the evaluation of online teachers is shown in Table 4.

Table 4
Assessment of elementary online teachers

	Items	Mean score	Agreement
1	Clarity on learning objectives	3	Agree
2	Clarity of instruction and guidelines	3	Agree
3	Clarity of material exposure in each category	3	Agree
4	The examples provided help users understand synchronous online teaching	3	Agree
5	The order of presentation of each category in teaching kit	3	Agree
6	Usability of each practice in synchronous online teaching	3	Agree

4. Conclusions

The research was conducted in the objective of uncovering the developmental procedure of synchronous teaching practices at elementary levels through Emotion Contagion Theory. The research employed the research and development approach by employing the ADDIE instructional model. The instrument utilized for data collection was a survey. The findings indicate that (1) the teaching manual's design and development process has clung to the ADDIE model, (2) The content

and instructional design experts' validations reflected agreement. Although experts commented on the development, the overall user's questionnaire responses averaged into the "good" category. Overall, users expressed that the module is qualified and easily comprehensible. One of the users suggested to provide more examples of non-verbal cues. Experts proposed a revision of the background colour to make it more interesting, add more details on how to create a genuine smile, and develop the teaching manual into a tangible synchronous teaching kit to increase its accessibility.

Acknowledgement

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