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ADOPTING INTERACTIVE CONTENT IN LANGUAGE EDUCATION: A REVIEW OF LITERATURE

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Abstract

The digitalisation of teaching is a reality to which we must adapt. In order to successfully design effective instructional design for learners, one must have competency in designing digital tools that are suitable for learners. This study reviewed papers published from 2005 to 2022 on interactive content particularly in teaching and learning context. A total of 32 research articles were reviewed to achieve the research purposes. The focus of this paper is on the type of interactive content applied in lessons, learners' and instructors' feedback on the use of interactive content, ways to design interactive content and its instructional design and finally the impacts of interactive content on higher education landscape. A discussion based on the results, followed by implications for future research directions and conclusions are also presented. This study is relevant as it provides in depth understanding on how interactive content can be better adapted in the future.

Keywords: Interactive content, language education, teaching and learning

1. Introduction

The importance of Information and Communication Technology (ICT) in education has been highlighted by The Ministry of Education in the Malaysia Education Blueprint (MEB) 2015-2025 by ensuring that learners have the knowledge on how to use and apply ICT in their learning process. Malaysia has reached the final stage of this transformation and by now, ICT should have almost been fully implanted in the pedagogy and curriculum of our education system. Moreover, the urge due to the Industrial Revolution 4.0 (IR 4.0) has gained great attention from practitioners around the globe to further explore the potential of various teaching applications in teaching and learning.

The use of technology is no longer considered as new in teaching and learning. The use of digital tools, online applications and technology-enhanced learning are becoming prevalent in the classroom. Most studies have shown positive effects of using technology in classroom. For example, Azmi (2017, p. 117) claimed that technology is relevant to be applied into language lesson because it "promotes learning, enhances interaction and communication, boosts autonomous learning, maximises targeted outcomes, motivates learners and helps them improve their performance in the EFL classroom". Similarly, using technology in classroom would offer various benefits such as allowing learners to create their own learning experience by interacting and engaging in collaborative tasks and complete multiple tasks across time and space (Jin et al., 2019).

The landscape of teaching and learning will no longer be the same as before the COVID-19 pandemic (Masrom & Nik Mohd Alwi, 2021). Hence, education institutions must be well-equipped with the challenges that comes along with the changes of the landscape. As such, it is undoubtedly that instructors should master the knowledge and skills in preparing instructional design that could cater these changes.

Rama Devi et al. (2022) has proposed the use of interactive content because it could help instructors to understand and identify any learning difficulties among learners. Interactive content is a learning material that requires the active participation of the learners as opposed to just listening, reading, or watching. It entails the integration of elements such as online quizzes, assessments, graphs, infographics, and interactive white papers. As there are many different types of learners with different abilities and preferences, instructors need to find the most effective way to adapt to these differences. This study attempts to provide   options for instructors so that learners have more options in creating their own learning experience.

This paper reviews studies of interactive content particularly in language education. Following Hemmingway and Brereton (2009), the authors identify relevant published articles by searching titles with interactive content and interactivity in the Social Sciences journals which resulted in 32 articles being analysed.

2. Research Questions

This study attempts to answer the following questions:

i. What interactive content technologies have been used to support language teaching and learning?

ii.   What are learners' and instructors' perspectives in using interactive content to support their language learning and practice?

i.   How to design the interactive content for language learning?

ii.   What are the instructional design techniques for designing interactive content?

iii.   In what way, interactive content has impacted the higher education context?

3.   Research Methods

3.1.   Selection criteria and procedures

In the current study, the review process was performed in three stages, as proposed by Kitchenham et al. (2007). The stages are: (a) planning, (b) conducting the review, and (c) reporting.

To examine the use and impact of interactive content to support education particularly in language teaching and learning, we reviewed articles reporting on empirical studies that were published in English, peer-reviewed journals between 2005 and 2022. The review is based on the journal publications from the Web of Science Core Collection and Elsevier databases. Fifty-four articles were deemed as eligible for this review. Finally, we did a search via Google Scholar. Through these searches, we located an additional nine articles. Duplicate copies and articles from non-peer-reviewed journals were removed, and we manually screened each article for relevancy. Only articles related to teaching and learning were included for the review. Finally, there were 32 articles in the final list for review.

3.2.   Inclusion and exclusion criteria

The articles were chosen after excluding those articles that were not related to teaching learning. The keywords adopted to search the database was ("interactive content") OR ("interactivity ") AND "teaching learning". Based on the keywords, there were 54 interactive content-related journal articles. The first group of keywords capture the important aspects of teaching and learning that have been addressed in relation to interactive content, including but not limited to English language. The second collection includes diverse interactive content used by educators their applications in educational settings. Figure 1 describes the searching steps involved in this study.
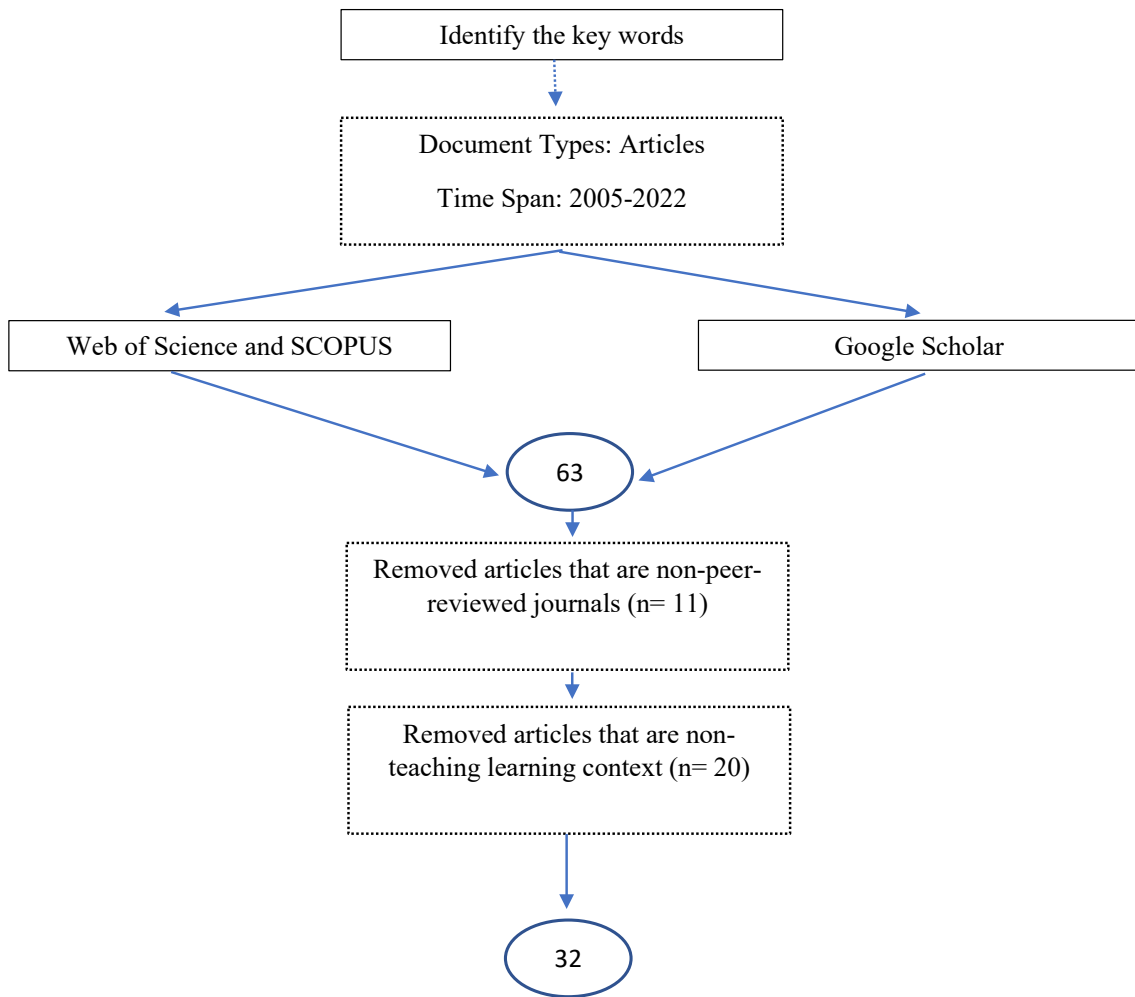
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Figure 1. Searching steps

4. Findings

4.1. Interactive content technologies in supporting language teaching and learning

Language learning technology has evolved over the years, from non-interactive to more interactive and becoming progressively sophisticated. In the beginning, the technology utilised for teaching and learning language was very simple. This includes tape recorders, televisions, and radios. These are not interactive as they merely "facilitate one-way communication and require metacognitive effort on the part of the user in order to construct knowledge from them" (Kennewell, 2005, p. 1). However, presently the technology is more advanced and versatile, having multiple interactive features that are crucial for successful language learning.

What makes these latest technologies appealing to both teachers and students is the fact they offer various interactive features, such as having the freedom to choose what needs to be learnt and how fast to go about it. According to Wekerle and Kollar (2022), "technology may promote student engagement in high-level learning processes in the classroom" (p. 1). Thus, for it to be effective, it has to encourage

learners to take an active part in the learning process instead of being passive. Gorbanyova (2016), believes that "interactive learning technology" is commonly associated "with computer or multimedia learning, as it implies, interactive dialogue with real partners and direct exchange of messages" (p. 54). In this sense, technology makes it possible for interactivity to occur as the technology "enables rapid and dynamic feedback and response" Kennewell (2005).

The importance of using technology with interactive contents in language learning goes without saying. Studies have shown that the more interactive a class is, the more engaging, and motivating the learning experience is for students. Thus, to achieve these, interactive technologies are indispensable and integral to the learning process.

Among popular modern technologies used in language learning are interactive whiteboards (IWB), smart classrooms, blogs, and interactive videos. In addition, the emergence of interactive applications such as Moodle's H5P and Lesson, and Genially has even made language learning more exciting and interesting. We shall discuss some of the most popular technologies in language class.

One of the most popular technologies that offers interactivity in learning is IWBs. It is a tool that is used to replace traditional whiteboard. IWB, according to Lee and Winzenried (2009) is "traditional whiteboard, a large digital convergence facility or a highly sophisticated digital teaching hub" (p. 166). As the name suggests, it is rather interactive as the device is connected to a computer to enable teachers to share materials online on the board. Various language activities can be done using IWBs including speaking, and writing. The board is widely used in many countries as it is believed that the IWBs encourage learning through increasing students' engagement in class, motivation level and enthusiasm to learn (Bacon, 2011).

Another well-known technology among language teachers is Moodle's H5P. H5P is a user-friendly tool that is freely available and easily accessible from Moodle platform. Using H5P, users are able to "create, share, and reuse materials" interactively (Rekhari & Sinnayah, 2018). To support language learning, various language activities can be created, and tailor made to suit the needs of the students.

The third instructional technology that is commonly used is lecture videos. However, most of the time, the videos posted are not interesting as they lack interactivity features, preventing students from having meaningful learning based on the videos. Because of this, Bakla (2017), recommended teachers to include interactivity elements to conventional lecture videos that enable teachers to assess students' progress, provide instant feedback, monitor students activities with regards to the video watching and conducting discussion based on the videos. Hung et al. (2018) provided guidelines on how to develop an interactive lecture video that contains activities that are interactive for students to engage with. They believe that an important element that needs to be included to make the videos interactive is the Interactive Learning Activities (ILAs). Through these ILAs, students can assess their comprehension of the video contents and are given instant feedback on their learning.

Another widely used learning tool that encourages students' engagement is the audience response system (ARS). ARS is a "web-based technology that provides instructors an efficient way to pose a question or a series of questions and collect digital responses from every student in the classroom" (clt.columbia.edu/ars). ARS is commonly used during lectures, class activities, and discussions (ibid)

whereby students are provided with opportunity to participate which will in turn increase interactivity during lesson, creating a more student-centred learning environment (Porter & Tousman, 2010). One advantage of using ARS is that it is suitable for all class sizes. It can be used as a double-edged sword. One is to allow students to be engaged in lesson, while giving teachers the platform to assess students' performance (Kay & LeSage, 2009; Petto, 2019).

4.2. Learners and instructors' perspectives in using interactive content technologies

Interests in the use of technology applications containing interactive contents have increased greatly in many areas including language learning. This can be seen from the review of studies in the following section covering various languages such as French and English as second language.

One such study was by Watts (1989) who conducted an experiment using two interactive videos developed for teaching beginning French to adult learners. The experiments which spanned over two months involved 30 adult learners. The findings indicate that the students overwhelmingly in favour of interactive videos when learning the language as indicated by their performance in the tests given as well as from the interview conducted after the sessions were over. Their improvements were mainly due to the increase in motivation level and the enjoyment they felt from this experience. Although the study was conducted over thirty years ago, using a rather primitive technology by today's standard, it was able to capture students' interests in learning the language just like what modern technology could.

More recent studies on the use of more modern technology particularly IWB and Moodle's H5P in English as a Second Language (ESL)/ English as a Foreign Language (EFL) contexts have also been conducted. One such study was by Wicaksono et al. (2021) who investigated polytechnic students' experience in using H5P in EFL class in Indonesia. The students reported that H5P has positively changed their behaviour and perception as they become more interested, engaged and motivated in the subject after being exposed to H5P for just six months. Studies have also shown that in language education, H5P is able to enhance greater vocabulary acquisition (Candela, 2021) and promote listening skills (Dhini & Ardiasih, 2021) among English language learners.

Studies on the impact of various interactive technology such as IWB (Teng, 2021), blog (Arslan & Sahin-Kizil, 2010), and interactive videos (Watts, 1989) have also been conducted in specific language skill such as writing (Arslan & Sahin-Kizil, 2010; Teng, 2021; Yeh et al., 2011), and vocabulary (Candela, 2021) using various methodologies such as experiment (Arslan & Sahin-Kizil, 2010; Teng, 2021), and survey (Wicaksono et al., 2021). In writing class, Teng (2021) conducted an experiment comparing the effects of whiteboard and collaborative writing in EFL class on students' performance. The experiment was done under the three different conditions namely IWB, traditional WB (TWB), and chalkboard. The findings showed that the students that were in IWB group had the most improvements in their writing. Additionally, they were reported to be highly motivated in learning writing. Similar findings were reported by Arslan and Sahin-Kizil (2010), who studied the performance of Turkish university students in two different conditions, traditional and blog-based instruction. Students in blog-based intervention group improved greatly in the mechanics of writing namely content and organization.

All the studies cited above have shown that students believe that their performance has improved resultant from the inclusion of technology with interactive contents in the class. This is partly due to the interests spurred by the technology hence increasing their motivation towards learning.

In the same vein, studies on applications with interactive contents have also been conducted on teachers to gauge their teaching experience. Based on the research, an overwhelming number of studies indicate that the teachers were positive about their own experience when the applications were integrated in their class. Among the aspects teachers cited to impact them positively relate to the efficiency, flexibility, and versatility of the applications (Glover & Miller, 2001; Miller & Glover, 2002). For example, Glover and Miller (2001) found that teachers reported to have better time managing classrooms, and more access to endless materials and resources.

Teachers' opinions were also solicited after using IWBs. They expressed their satisfaction with the technology as it gives teachers control of their class. This is because they are able to face the students in person as opposed to watching them on the computer screen (Wood & Ashfield, 2008). This gives them the sense of being in control of their class. Likewise, Abuhmaid (2014)'s study on Jordanian teachers found that teachers acknowledge the benefits obtained from using IWB despite being sceptical on technical aspects crucial to the implementation.

Based on these studies, it is safe to conclude that teachers also share similar views towards the use of technology with interactive contents. In other words, teachers are more inclined to use the technology as tools to increase students' engagement, motivation, and performance.

4.3. Designing interactive content for language learning

One of the important skills that language instructors must acquire to deliver effective language teaching and learning is the ability to design effective interactive content. To achieve this aim, the fundamentals of designing such content need to be applied. Thus, the researchers had perused available literature on interactive content, but unfortunately, found only a few articles which focused on language learning while others were on various disciplines. Nevertheless, some of the main tenets of interactive content could be applied to language learning and this has led us to developing the framework for designing interactive content that encompasses compatible system for interactive content, cognitive load requirements for language content and scaffolded interactive language activities (SILAs).

The COVID-19 pandemic has been a strong catalyst in changing the landscape and ecosystem of traditional language learning and teaching. Language instructors and teachers have been somewhat forced to adapt to the immediate use of technology in their classrooms – be it virtual or face-to-face - and this leads to one persistent conundrum: how do language instructors design interactive content for language learning? Based on the available literature and studies on interactive content and language learning identified, the following considerations must be factored in before and while designing interactive content: 1) identification of systems that support the interactive content, 2) cognitive load requirements for interactive language processing, and 3) integration of scaffolded interactive learning activities (SILAs) in the content.

Prior to designing interactive content for teaching and learning, a system that supports the interactive content must be identified first since most designing process might happen in the system, or

the design needs to be compatible with the system's basic requirements. Due to the increasing use of the Internet for virtual learning, online learning sites and tools are mushrooming rapidly to cater to the needs of language instructors and learners which include H5P (Candela, 2021; Chen et al., 2021; Homanová & Havlásková, 2019; Joubel, 2022; Killam & Luctkar-Flude, 2021; Wilkie et al., 2018), iBooks Author (Gonzales, 2021), Web3D (Chittaro & Ranon, 2007) and HTML5 (Naidu et al., 2021). Identifying the correct system is crucial because designing interactive content requires the instructor's technical and information technology knowledge as well as identifying the learners' ability to use the interactive features in the system, preferably autonomously. Interactivity of content generally depends on the system's technical specifications because each system differs in its use and purpose. A study by Candela (2021) on H5P - a plugin which enables the creation of interactive content such as videos, games, quizzes and presentations - found that students performed positively in their vocabulary acquisition after memory games, dialogue cards and interactive videos were integrated in the teaching and learning process. This could be achieved because both instructors and learners were able to use HP5 as they were familiar with the interface, instructions, and functions of the plugin.

Responding to interactive content online is different than responding to the same content face-to-face. Luo and Lei (2012) define interactivity as "how different components in a system act upon each other to facilitate learning" (p.75) and categorise it into four types of interactions: 1) learner-content, 2) learner-instructor, 3) learner-learner and 4) learner-interface. The learner-interface interaction happens when learners are able to manipulate tools on the learning sites to complete assigned tasks. This indirectly adds on to the cognitive load of the learners. Wilkie et al. (2018) discussed the management of cognitive load in designing H5P online interactive activities and suggested that instructors think about how cognitive load affects learners of different level for ease of comprehension. Novice learners (both for technical and content knowledge) may find it challenging to attempt interactive content due heavier cognitive load and processing than experienced learners.

Interactivity of a content is reflected in the integration of interactive learning activities (ILAs). Hung et al. (2018) observed that ILAs provide interaction between learners which consequently enrich the interactive content. In their study on embodied interactive video lectures for improving learning comprehension and retention, six ILAs types were identified and are illustrated in Table 1.

Table 1. Six ILAs with scaffolding function proposed by Hung et al. (2018, p. 120)

Interactive Learning Activities (ILAs)	Scaffolding Function	Description
Engaging	Recruitment	In the beginning, an instructor actively encourages the learner with a prolog or an audience expresses motivation for the content. Then, the learner makes a simple response to the instructor or audience respectively.
Prompting	Reduction in degrees of freedom	An audience actively asks the learner a question for reflection, and the learner has 30s to think about it. Then, the audience provides a thought related to the question.
Experiencing	Direction maintenance	The learner performs a tiny exercise or a simple simulation related to the content with the guidance of an instructor.

Facilitating	Marking critical features	An instructor actively provides crucial learning concepts to the learner, and the learner can strengthen the impressions on the learning concept
Demonstrating	Demonstration	An instructor provides an example, ideal case, or solution to interpret a learning concept, and the learner can have a better understanding of the learning concept.
Questioning	Frustration control	The learner can ask an instructor for assistance from a set of selected questions and receive a corresponding answer when being in trouble with a learning concept.

Based on Table 1, the six ILAs are engaging, prompting, experiencing, facilitating, demonstrating and questioning. Each ILA is also accompanied by scaffolding functions to structure learning, and these illustrate the constructivism theory proposed by a prominent psychologist, Lev Vygotsky. A study by Teng (2021) on interactive-whiteboard-technology-supported collaborative writing found that scaffolds using interactive whiteboard technology could be beneficial to EFL students' writing performance. Many studies have remarked on the positive functions of scaffolding in interactive content (Chen et al., 2021; Teng, 2021; Wilkie et al., 2018) for effective teaching and learning. Thus, it is pertinent that scaffolded ILAs (SILAs) are inserted in the designing process of interactive content.

Based on these three considerations – compatible system, cognitive load and scaffolded ILAs, the framework for designing interactive content for language learning was developed, as illustrated in Figure 2.
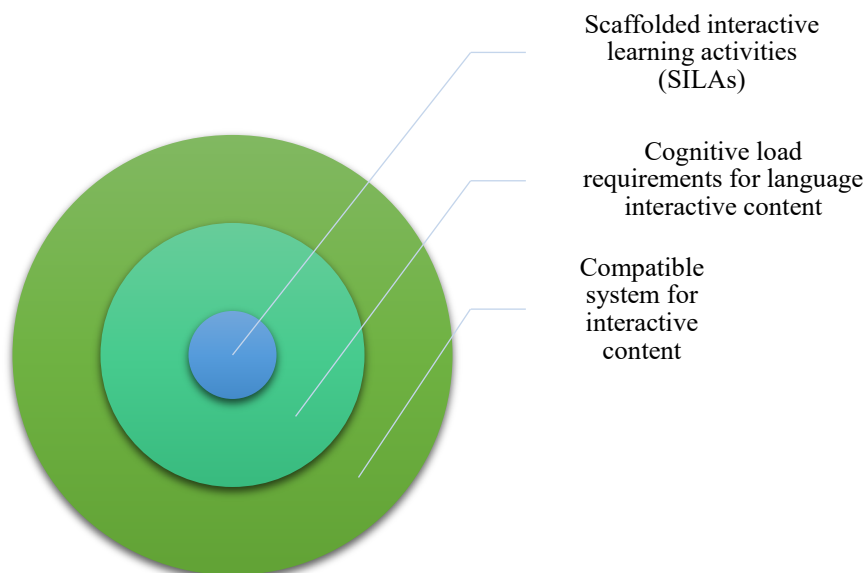

Figure 2. Framework for designing interactive content for language learning

As illustrated in Figure 2, designing interactive content for language requires these considerations: compatible system for interactive content, cognitive load requirements for language content and scaffolded ILAs.

4.4. Instructional design techniques for designing interactive content

To produce well-structured interactive content, instructors need to apply effective instructional design techniques. There are many instructional models which have been explored in various studies such as Merrill's principles of Instruction, Gagne's Nine Events of Instructions, and Four-component Instructional Design (4C-ID) (Frerejean et al., 2019). However, this section mainly focuses on two influential models: ADDIE and ASSURE. Studies pertaining to these models will also be included to illustrate the models' functions in designing interactive content, specifically for language learning.

ADDIE Model was originally developed for the U.S. Army by the Centre for Educational Technology at Florida State University in 1975. Since then, the model has evolved and started to be applied to other fields, including education. ADDIE is an acronym for Analysis, Design, Develop, Implement and Evaluate. In designing interactive content for language learners, the first step in ADDIE Model is for instructors to analyze the learners' language needs. Armed with the knowledge of learners' needs, instructors proceed to the second step – design. In designing the interactive content, instructors consider the strategy, objectives, and the delivery of the interactive content (Frerejean et al., 2019). The next step is development of content. This requires instructors to develop the materials before implementing them to their learners. Finally, the evaluation of the interactive content is conducted so as learners' feedback could be obtained for future improvements. Figure 3 shows how ADDIE Model functions in designing interactive content.
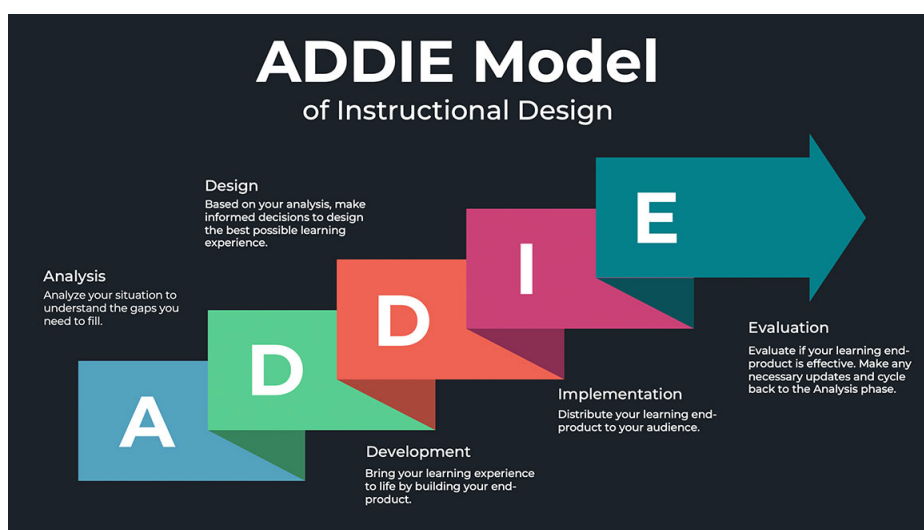

Figure 3. ADDIE model (https://waterbearlearning.com)

Despite its wide use in research (Drljača et al., 2017), there are a few criticisms regarding this model. The criticisms are generally about its linear process and its inability to develop instructors' innovation in the design process (Frerejean et al., 2019). Consequently, ASSURE model was introduced.

Figure 4 shows the ASSURE model. Compared to ADDIE model, ASSURE model include explicit requirements for learner participation. This step is particularly important as interactive content demands for learners to be engaged with the process. Recent studies have also used this model and found that it works for online content. A study by Choi et al. (2022) on blockchain learning game-themed

education found that it was viable for an education programme to teach blockchain principles using games and the use of ASSURE helped to achieve this aim.
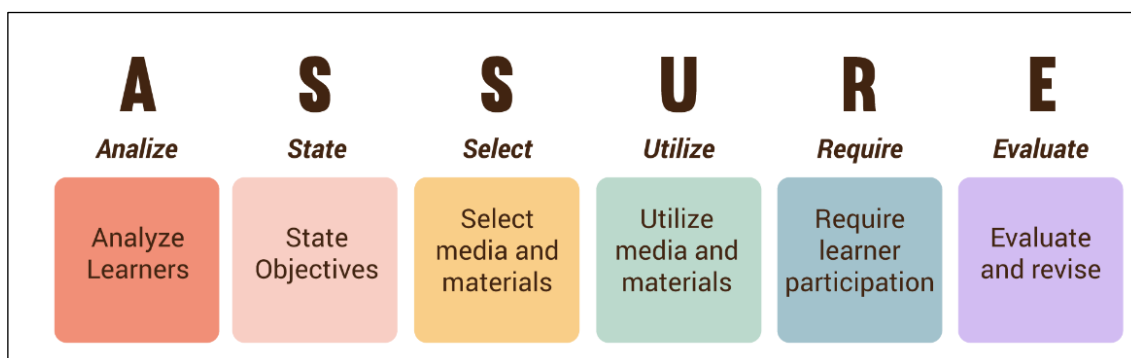

Figure 4. ASSURE Model (https://elearningindustry.com/)

In sum, ASSURE Model is generally favored for research in designing interactive content compared to ADDIE. However, it does not mean that we can dismiss ADDIE since this model set the foundation for other upcoming models, particularly when the digital world is fast evolving.

4.5. The impacts of interactive content in higher education context

The use of interactive content in higher education has proliferated due to the pandemic. Thus, this section discusses the impacts of its use from the perspectives of learners and instructors.

Since the breakout of COVID-19 pandemic in 2020, higher education institutions have been utilizing online learning platforms such as MOODLE (Acar & Kayaoglu, 2020; Homanová & Havlásková, 2019) as an alternative for face-to-face teaching and learning. The content used in this platform has evolved rapidly due to the demand of instructors and learners on interactivity elements of the pedagogy and content. Thus, studies related to the impacts on interactive content in higher education context are increasing (Chen et al., 2021; Naidu et al., 2021; Wilkie et al., 2018). Generally, most studies reported positive impacts in using interactive content for higher education context. Acar and Kayaoglu (2020) conducted a quasi-experimental study on 44 tertiary level students on the impact of MOODLE in improving participants' English proficiency. Results show that there was statistically significant difference between the experimental group and the control group's achievement in blended EFL lesson after MOODLE was used as the intervention. Findings from a study by Candela (2021) concurred with the general consensus that interactive content like H5P helped learners to improve their English. In her study, it was reported that H5P could be an effective and beneficial tool for the acquisition of new vocabulary in second language learning. Muir et al. (2022) reported that using interactive online pedagogical approaches to promote student engagement requires "instructors utilized a variety of interactive methods to promote the learners' interaction with the content, such as games, weekly challenges and puzzles, videos, discussion boards, and unit-specific digital tools" (p. 15).

However, these findings seemed favorable only when the instructors know how to utilize available resources for interactive content. Benoit (2018) in his case study of over five years with 400 participants found that interactive whiteboard (IWB) had little impact to student learning due to underutilization of

IWB whereby 70 percent remarked that they used IWB software in less than one-quarter of their lessons while 50 percent indicated that students never physically interact with the IWB.

To conclude, the impacts of using interactive content generally depend on the instructors rather than the learners. Interactive content could be effective and offer good impacts to learners' learning experience when the instructors know how to use the interactive content effectively.

4.6. Implications and limitations

The review of literature in this study underscores several implications. Generally, it proposes education institutions to highlight on aspects specific to each institution that could assist instructors to use interactive content so that positive outcomes could be produced. For instance, factors related to learners, instructors and instructional design could be improved so that effective interactive content could be designed. Designing instructional design for interactive content requires a total devotion from different parties including learners, instructors, and institutions. Literature has shown that interactive content has prospect and gained positive feedback from not only learners but also instructors. Therefore, instructors should devote more attention in designing contents to suit the digital environment and identify the type of interactive content that could promote greater engagement and motivation in learning. A constructive and supportive ecosystem is needed for online learning to be successful and useful.

This paper studies literature that focuses on the use of interactive content in language education. It provides a theoretical foundation in understanding the issues related to the available application or technology for interactive content, learners', and instructors' feedback in using interactive content, instructional design, designing interactive content and its impacts in higher education context. Nonetheless, some limitations of the data provided here should be acknowledged. Firstly, the data in this study were gathered through exploration of literature related to interactive content in teaching and learning context. Thus, it would be useful to use different search criteria and selection of publication in future studies; for example exploring samples of best practices of interactive content and examine the effectiveness of interactive content in teaching and learning. Secondly, this study offers information on some guidelines for instructors that could be considered upon planning and creating interactive content for their course. Future explorations using qualitative or quantitative approach could also consider the influence of learning dimensions such as learner attitudes and individual differences.

5. Conclusion

Teaching and learning is an on-going process of acquisition and expansion of information. From a traditional approach such as chalk and talk and face-to-face to online learning and hybrid learning, the process continues to be the main structure in our education system. In the effort of providing efficient teaching and learning, instructors at all levels should take up the challenge to incorporate various technological applications into their classrooms. The studies reviewed in this paper reveal the fact that there are more potential of interactive contents that need to be further explored. As such, instructors could think of the ways on what type of interactive content and in what way it could be used in classrooms to enhance the learning.

Currently, there is a lack of information about the interactive content elements that could contribute to positive learning outcomes or effective learning performance. The present review was done to allow more in depth understanding of the aspects related to interactive content. Several frameworks from previous study that could be applied when designing effective interactive content were also reviewed. Finally, the review presented in this paper have led to further understanding of how interactive content has impacted the higher education ecosystem.

All in all, this study unveils the potential of interactive content particularly in language education. Although using interactive content is not a robust solution in enriching teaching and learning, but it could serve as one of the means to support effective teaching and learning in this era. Hence, further studies should be conducted in other contexts and looking at other dimensions to address the issues related to interactive content.

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