Digital Technology Implementation Towards English E-Modul at Engineering Department in State Polytechnic of Bali

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Abstract

Technology utilization in English learning instruction has been a significant tool to increase the learners' ability and comprehension in Polytechnic education. However, the absence of systematic and suitable digital English learning materials frequently impacts the decrease of students' urge in learning the lesson. This study aims to establish s systematic digital learning material suitable for the engineering department students at the Polytechnic State of Bali. This research applied the qualitative method which explained the students' arguments for the use of e-module in the English lesson. The unified theory of acceptance and use of technology (UTAUT) was used to analyze the data obtained from the students. The learners opined that the e-module provided important media which significantly escalate comprehension and eagerness of the English language. Although this e-module was beneficial, the urgency of generating the learning materials towards offline and online instruction ought to be conducted.

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1 Introduction

In the horizon of technology, the world is expanding day by day, and automation in every area is a welcome one (Hariharasudan & Kot, 2018). The development of technology has improved significantly in many fields including education. The most important is how technology is applied to support teaching and learning (Higgins et al., 2012). The use of new digital tools shapes teachers' abilities to articulate their thinking and understanding (Johnson, 2016). Many tools can be used by lecturers and teachers to support the use of learning materials in the classroom, for example, smartphones, computers, and laptops. The devices can be employed to run the platform for the classroom instructional for example, Google classroom, Quizizz, and Google forms. The use of Google forms as a platform to provide the assignment is favoured by the lecturers. This tool design engages the automatic scoring system which will be beneficial for the teachers and learners to obtain the mark and result. Lecturers are required to improve the tool using technology such as Google Forms in the classroom which should be suitable for the learners' necessity. The combination of learning material and Google Forms showed flexibility towards obtaining knowledge and eagerness (Sadiyani et al., 2021). Google form platform immersion to the learning tools in higher education generates contributes to innovation in the teaching and learning process. Selecting suitable technology for the learning materials and curriculum can be a challenge for the lecturers. A challenge for curriculum developers and teachers is how to best utilise the technologies that students are currently using for non-educational purposes as teaching and learning tools, and to prepare teachers and students for these developments (Rachid et al., 2018). Specifically, the previous study explained that language learning is initiated in the classroom and actualized beyond the classroom in real-life situations mostly through technology used nowadays. The English teacher is responsible for guiding their learners to monitor their studying processes both within and beyond the classroom (Sert & Boynuegri, 2017). Furthermore, technology through social media, for example, Facebook, Instagram, and Youtube have been significant tools for the teacher during the delivery of the material in the classroom. The previous research engages hybrid learning between traditional and remote learning processes. As students have a positive perception of ICTs, especially social media, the article proposes blending the traditional classroom model of teaching with cooperative and collaborative online learning practices (Elboubekri, 2017). It means that social media have a massive change used by teachers as nutrition and supplementary through the teaching and learning process. This research can be the response to the type of suitable tools in developing the student's comprehension. In terms of the device used to operate the platform, laptop, computer, smartphone, and tablet, the utilization of tablets suggested by the previous research which generated meaningful learning tasks and digital adaptability were seen as pedagogical benefits of using tablets (Otterborn et al., 2019). On the other hand, the smaller device may be favoured by learners as it offers flexibility and is handy. The smartphone, for instance, has great size, modern technology, and high specification to run several learning platforms. By applying the smaller device to run the learning platform, it can be accessible for the learners to learn the lesson during the instructional process (Lin et al., 2003; Seufert, 2003).

In the pandemic era, the tendency of applying e-module resulted in ineffective tools used in the teaching and learning process (Aini et al., 2020). Remote learning can be maximized by applying electronic learning materials, for instance, e-module. This specific e-learning can be delivered to the learners' devices, for example, laptops and smartphones. The function of the e-module is used to cover the learners' demands that required them to write a report in English after the students joined the apprenticeship program. Since the students have no meetings, they are demanded to independent learning. The E-module, as the nutrition materials, is improved to fill the gap in which the materials are specific for academic purposes. Employing a writing process approach is appropriate for the students in writing their reports step by step. Besides, the E-module provided deductive learning consisting of learning objectives, teacher instructions, students' activities, students' worksheets, answer keys, and an evaluation sheet focusing on writing a report that is expected for the student's autonomous learning. The form of an e-module can be linked to the learning platform to enrich the innovation of the learning materials. The previous research designed the integration between e-module with Edmodo in teaching the writing topic (Puspa et al., 2018).

On the other hand, the tendency of employing the traditional printed module are dominant in English for engineering lesson which resulted in the rigidity of the teaching and learning process. The printed cannot be integrated with the technology which lessens the innovation during English instruction. Based on the problem above, this research aims to analyse the Digital Technology Implementation Towards English E-Modul at the Engineering Department at the State Polytechnic of Bali.

Theoretical review

Digital Technology

From the pre-Socratic Greek philosophers, the principle of (divine) ordering in the word "Logos," involves the principle of creation that was conveyed in the meaning of "Techne" (Skrbina, 2014). Technology is something that is itself, always inherently intelligent enough either to perform, or to be imbued with, a function, purpose, or benefit, that only intelligent species, human or otherwise, can appreciate (e.g., nut-cracking) (La Shun, 2017). This results in the simplicity to attain the information which enhances the human need.

The implementation of digital technology through classroom instruction has been a vast opportunity for teachers around the world in delivering the material. An overwhelming majority of teachers in Europe (90%) use ICT to prepare their lessons (Chhabra, 2012). Similarly, the improvement of technology has been a massive education project to enhance education in the US. In other words, developing education through the technology utilization conducted in the US contributed to the discovery and reinforcement (Motteram, 2013). Currently, several studies have been implemented to discover and solve the problem by using digital technology, especially in English for Foreign Language classes (Mollaei & Riasati, 2013). The issues frequently faced in conducting remote learning can be reduced by immersing in the technology.

e-module

The general function of the module assists learners to absorb the learning topic significantly. Modul consists of several topics, assignments, tasks, learning media, and rubrics on how to score the learners' skills and comprehension. The advantage of an e-Module is interactive and allows the loading of audio, video and images as well as formative tests that can display feedback automatically (Grellet, 2015). By using the device, for example, a smartphone, laptop, tablet, or computer, the e-module can be run systematically and easily. This leads to the accessibility of learners in higher education especially to absorb the materials given by the lecturers.

2 Materials and Methods

The qualitative method was applied to describe the learners' argument and there were 20 students were involved in this study to provide a wider range of opinions on the e-module in the engineering department. The *unified theory of acceptance and use of technology* (UTAUT) was applied as the parameter in collecting the data process in this study. Performance expectancy (PE) and effort expectancy (EE) were the specific types of UTAUT applied in this study. The (PE) focused on the positive impact and the usefulness of the device, while the (EE) on ease of technology use and the importance of use towards Bali State Polytechnic students who learn English in the Business Administration department.
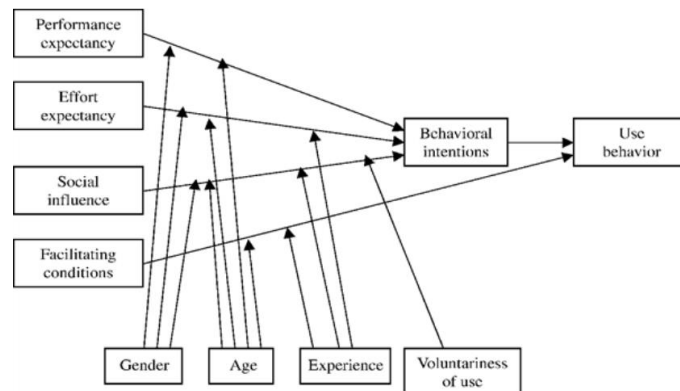

Figure 1. UTAUT (Venkatesh, 2016)

3 Results and Discussions

3.1 Result

The Content of English for Engineering e-Module

The design of the e-module aimed to attract the learners' urge to learn English for specific purposes, this learning material consists of 11 chapters that have different topics and discussions. The speaking, reading, writing, and listening skills were immersed in this learning kit which could assist learners to escalate their ability to practice the English language (Hashemi, 2011; Paradis et al., 2010). The structure or grammar tasks have been set and prepared using the google form application. This platform was applied to generate an automatic scoring system after the learners submit the answers. Colourful animation dominated each chapter which increases the innovation of the module design. Furthermore, this module provided a chance for the learners to listen to the audio and watch the video flexibly. According to the audio and video media, these tools were saved into google drive which could be accessed by the learners during the language instruction. The tasks were prepared using the google form platform while the games were linked to the website application. The hyperlink was also utilized to integrate the e-module into the learning media put on google drive and the website.
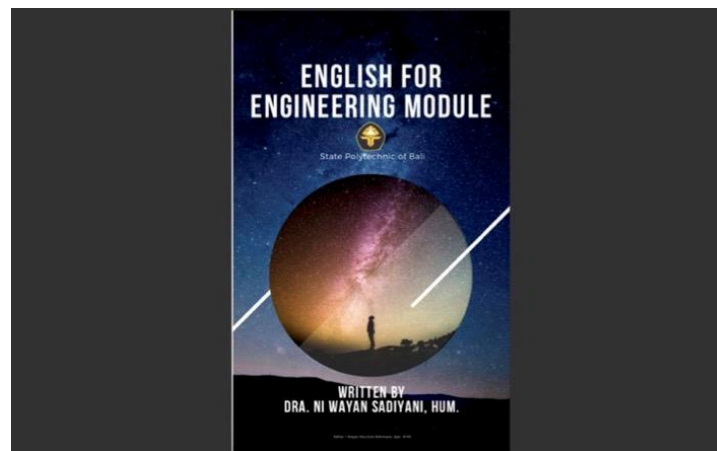

Figure 2. The cover of the e-module

Based on figure 2, the design of the title "English for Engineering Module" was placed above the Polytechnic State of Bali logo. This e-module was established for students who study English for Engineering at the Polytechnic State of Bali. The first and second writers' names were situated below the campus logo. The researcher chose dark blue as the dominant colour to display the knowledge scene.

Figure 3. Table of content

This e-module provided 11 chapters that elaborated on specific English skills and grammar in each chapter. The theme of the chapters ought to be related to the engineering study. The topic of 'Do You Speak English?' was applied to present a brief illustration of how to make small conversations with classmates. In this chapter, the learners presented some conversation and audio, the students were allowed to write the correct word based on the audio. Subsequently, simple present tense was inserted into this chapter as it would escalate the learners' ability in English simple grammar and writing. The first chapter allocated students to practice their comprehension of speaking. The expectancy of providing speaking skills in this chapter was to lead learners to use the English language verbally. The second chapter, 'We Use These Tools' was chosen to specifically introduce the tools or equipment applied to Engineering. Different types and pictures of engineering tools were displayed to enrich the learners' vocabularies. The student's ability on speaking was focused to mention and utter the name of each tool. Another picture was prepared and integrated into the audio which concerns how to pronounce the engineering equipment. Chapter three of the e-module commenced with reading the procedure for changing the oil on a motorcycle. This activity instructed the students to read the passage carefully and analyze the step from warming up the engine to adding the oil to the machine. Additionally, the hyperlink was added to this chapter to inform the learners watching the video about the process of replacing the oil from the machine. In the fourth chapter, the present continuous tense was elaborated, this aimed to explain to the students the use of current activities. Several examples are provided to enhance learners' comprehension of using this simple grammar. Simple games were integrated into this chapter, and while the hyperlink was accessed, the students would automatically visit the game's website. In the next chapter, reading and structure related to the engineering concept were concerned. By having read in this session, students had potentially increased their vocabulary and simple sentence structure. On the writing task, the researchers generated the task using google Forms and created the link which was put in this chapter. Learners were allowed to click and answer every assignment which then automatically go to a google form to answer every question. For the sixth topic, pictures were employed to offer visual learning tools. In this chapter, the speaking skill was emphasized and the structure of this ability focused on the present continuous tense. The first picture explained how students assemble the small simple car, while the second picture explained how to check the air condition machine. The learners checked the component of this machine which would be beneficial for students to understand the name and function of each part. The third picture illustrated how the students try to fix the motorbike, the motorbike was checked before the learners tried to analyze and fix it. In chapter seven, the materials are designed to allow learners to analyse the simple past tense. 'What did you do yesterday?' was the title of this session selected to familiarize the daily activities and workplace situation. Audio and four conversations were provided, additionally, the first writing task was added to analyse learners' abilities. Sentence structure was displayed to enhance students' understanding of past tense form and it assisted learners to have more references before making their example. In the next chapter, learners were given several irregular past tense verbs. By obtaining these vocabularies, students were expected to evoke the range of irregular verbs commonly used in daily activities and the workplace. After the irregular verbs' introduction, learners were instructed to practice their speaking skills. The ninth chapter pursued the students to practice their speaking ability which would be beneficial in sharpening their critical thinking. The learners ought to express and elaborate on the activities in the picture using the past tense. Four pictures were put in this session, the first picture illustrated how the people check and analyze the machine. In this part, learners were instructed to analyse the three people that observed the machine. The second picture showed the process of how to measure the liquid for the chemist form. There were more than six students who focused on the fluid related to the machine. The third picture explained how two learners observed the mechanical elements which were important for the ESP students in engineering. The last picture showed how the students fix the wires of a machine in the laboratory. The next chapter is mostly concerned with learners listening and speaking skills. This chapter is generated to explain the use of the future tense during daily activities and in the industry. In deciding the title, 'They will study at the campus' was chosen to provide a theme for this chapter. On the listening ability, a hyperlink was put to connect the video to google drive. The last chapter was consistently defining the future tense, and the structure of creating and applying the future tense was a concern n this session. The learners were required to build future tense using 'going to' and 'will'. Furthermore, vocabulary related to the machine tools was displayed in familiarizing the specific equipment used in engineering.
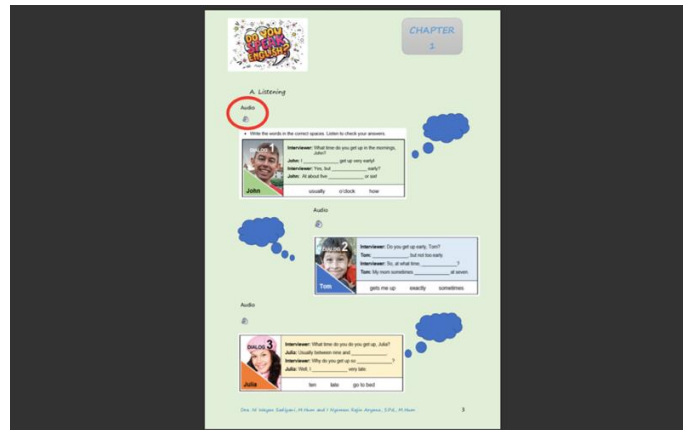
Figure 4. The audio symbols

In this module, various audios were prepared to support learners' ability in listening and pronunciation in specific vocabularies. According to figure 4, the symbol of 'speaker' means the learners can directly click and access it and listen to the audio through the google form. The function of the audio led learners to analyze the conversation, answer the assignment, and sharpen the ability of vocabulary pronunciation. In analyzing the conversation, students had a chance to replay the audio prepared by the researchers, as a result, learners specifically understand the topic of each conversation. In answering the task, the incomplete statement should be finished by the learners. The learners were allowed to repeat the audio to reduce the wrong answer selection. This also contributes to the learners' comprehension in pronouncing the vocabulary in the English language.
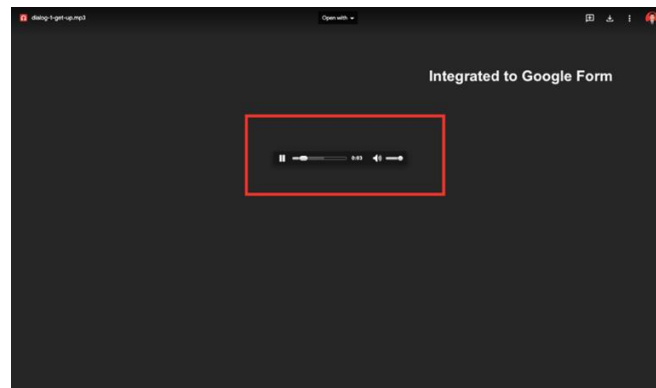

Figure 5. Audio integrated into the google drive

When the learners tap the 'speaker' symbols, the program would directly connects to google drive as all of the listening sessions were saved on this system. The significance of this system is to decrease the risk of losing the data. Based on figure 5, the option to change the volume and download the file was provided as this was important for students who did not have frequently internet access. Cloud systems provided a safer method of keeping the data. However, if the internet connection was lost, it would be difficult to access the data from google drive.
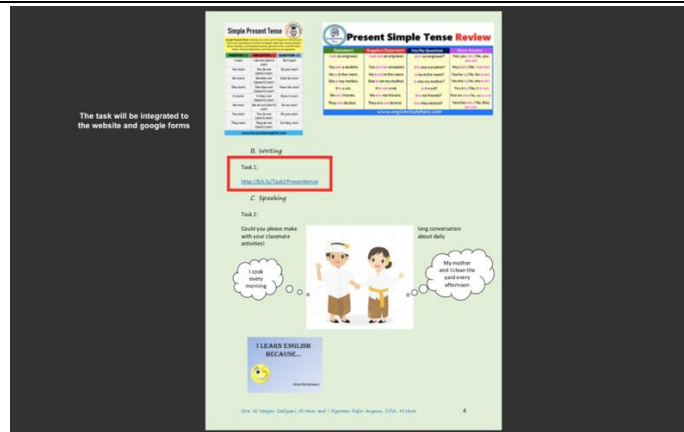
Figure 6. A task which is integrated into the google form

The study conducted by the researchers found that it was beneficial for the developers and lecturers to employ google forms in assessing the students through the teaching and learning process. The advantage of google forms was to gain the learners' ability through the direct scoring provided by the platform. This application could be modified by adding images and changing the colour background, video, and audio as part of the questions. The task must be generated by using the google forms website and several options could be chosen to build the question. When creating the assignment had done, the next step was to make the link which then attaches to the e-module.
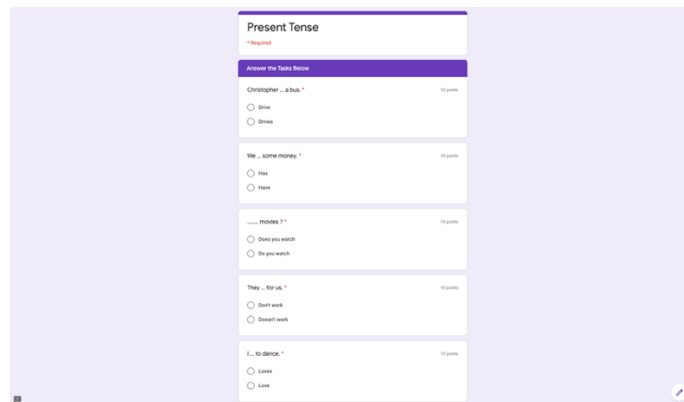

Figure 7. An example of a task

Figure 7 represented the task that ought to be finished by the learners during the English language instructional. When the students clicked the hyperlink provided by the lecturers, they would be directed to the google forms. The learners must type the full name, semester, and classroom before working on the assignment on the next layer. The questions had to answer before submitting it to the program. This was set by the researcher to avoid unanswered questions. All of the data could be seen from google forms and converted to excel form which would be downloaded by the lecturer. This result then could be analyzed to check the learners' scores on the English language assignment.
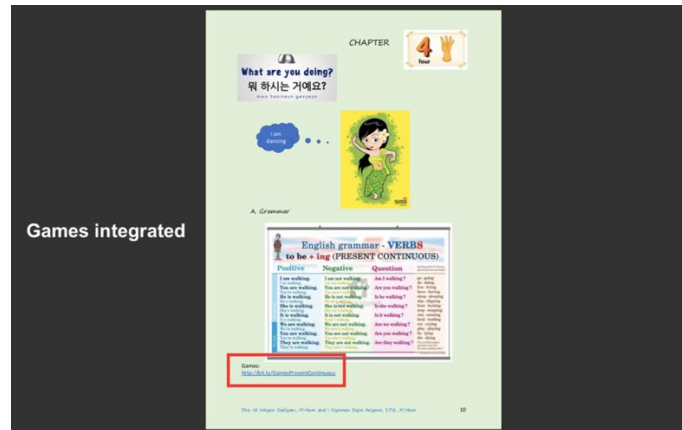
Figure 8. Games integrated into the platform

The games were integrated into this e-module to enhance the students' eagerness to learn the English language. Several platforms designed learning materials through games for example Kahoot and Quizizz. These platforms have many media for example interactive website background and theme, special audio, image, extra points, and cartoon which can encourage learners to get more points. However, these games must be designed separately as they need a specific code in running each assignment. Simple website games that have intuitive direction are favoured on this e-module as this reduces the demand for extra time. By selecting the hyperlink, the learners would directly connect to the website and be ready to answer the questions based on the instruction.
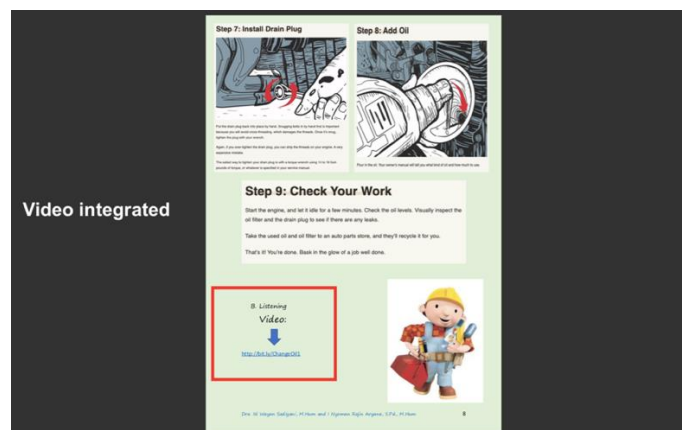

Figure 9. Video integrated into the google drive

In assisting the learners to provide the audio-visuals, the video was uploaded to google drive which could be accessed and watched by the learners. The concept was similar to the audio file, the video was put into google drive to reduce the risk of losing the data. This file also could be downloaded to reduce the high internet data use.

Students' perception of the English for Engineering e-module

According to the students' perception in the engineering department on the impact and the significance of the e-module applied in the classroom, The learners' believed this module had a positive influence during the teaching and learning process on their English language skills. In terms of performance expectancy, students argued that the e-module contributed to learning effectiveness. The learners' arguments can be elaborated as follows:

"help me to learn especially to learn about new vocabulary"

"the e-module is one of the most innovative teaching material that can be used"

> *"help me to learn about the photo gallery to assist me improving my speaking and listening"*

> *"can improve their experience English lesson help you increase your to learn English"*

This e-module had a substantial role in enhancing the learners' vocabularies in engineering lessons. This learning media was the innovation that could allow learners to access specific materials through classroom instruction. The initiation to put the image resulted in the learners' positive impression of the e-module. Most of the pictures were chosen to integrate and conduct the descriptive topic which allowed students to read the step of fixing and replacing the oil machine. The figure was also selected to provide to encourage students in expanding the idea of each topic. With the new experience of using this learning kit, the increase in English skills could be significantly obtained by the learners.

Based on the effort expectancy, the students understand how to operate the e-module without excessive instruction. The accessibility of the e-module which could be operated by using a smartphone contributes to the learners' favour to use this learning kit. The learners could select the task and the option easily without any problems.

> *"I can a study and select e- module from my phone"*

> *"easy to access this a model which is an enrichment for students to make it easier for the dance show to learn learning listening"*

> *"I could use my phone to study without opening a book question number three that it gave the Simplicity to learn English"*

The tendency of students urges in apply smartphones to learn the English language was one of the reasons to conduct and design this e-module. The smartphone allowed learners to run the learning tool smoothly. The video, audio, assignment, and games could be accessed and selected directly. The listening session was practised briefly by the learners and this influenced the increase of the skill. The use of smartphones evoked learners' eagerness in learning the English language in the classroom. This reduced the chance for the users to employ the printed book as the digital book or e-module had potentially assisted the classroom instructional.

3.2 Discussion

Based on the UTAUT theory, the learners argued that this module has a positive influence on learning material accessibility. The convenience of employing this learning kit assists the learners to generate significant arguments which directly escalates their critical thinking through the teaching and learning process (Böckerman et al., 2009). The e-module provides the opportunity for learners to apply the smartphone in running the platform. Operating the e-module using a smartphone resulted in the flexibility to learn the lesson. The design of the electronic module was proposed for higher education students who study in the engineering department (Kinker et al., 2021; Henriques et al., 2018). The topic selection must be suitable for the learners' demands and curriculum to escalate students' English language ability. Each session of the e-module had specific lessons and discussions which led the teachers and learners to conduct effective interaction during the instructional process. Immersing audio, video and games in this digital learning material potentially develop the student's critical thinking in analysing the content (Naslund et al., 2017; Margaryan et al., 2011). Visualisation assisted the learners to provide a wider perspective about the topic discussed in the classroom. This also could be applied to contribute to the structure understanding especially subject-verb agreement and simple past tense. Based on the research, most of the students at the Polytechnic State of Bali faced shortcomings in learning subject-verb agreement and simple past tense (Rahmanu et al., 2020). The weaknesses faced by learners were because there was an indication of the inappropriate method and learning material employed by the lecturers. Suitable and systematic learning materials potentially reduce the rigidity during English language learning. The e-module in this study allows students to learn English language skills which include speaking, listening, reading, and writing skills (Rohr et al., 2022).

On the other hand, the use of modern technology mostly needs a stable internet connection as this module must be integrated into google drive to access the audio and video. Other learning media i.e. Youtube, WhatsApp, Facebook, Instagram, and Google Classroom tend to require the ideal network access (Nugroho & Atmojo, 2020). The technology utilization cannot stand alone which means that the combination of multimodality, smaller device, and internet technology suitable for higher education are necessary suggested in delivering the learning material (Rahmanu et al., 2020). In designing the learning materials, e-module for instance, the combination of several concepts must be conducted. The theory of multimodal which focus on the use of various text, image, audio, and video must be concerned to decrease the misconception in delivering the learning objectives. Similarly, the internet connection must be considered by the developers and lecturers in establishing digital learning materials.

4   Conclusion

In the modern technology era, higher education learners believe that technology has a significant role to enhance their ability, especially in the English language. The millennials are inclined to use digital tools as they provided wider references and sources of knowledge. This e-module assisted learners to expand their ability in the English language in the engineering department at the Polytechnic State of Bali. The significant perception argued by the learners in employing this e-module during the lesson activities. This learning tool also was compatible with smaller devices, for example, smartphones and tablets, which lead learners to gain knowledge fast.

However, the e-module was still designed using an internet connection which sometimes could be a barrier for learners who did not have stable internet access. In future studies, it is recommended to establish an e-module that can be accessed offline and online. Designing e-learning with and without the internet can potentially decrease the rigidity of using digital technology. This also enhances the hybrid learning system that provides lecturers and learners to conduct the teaching and learning process through synchronous, asynchronous, face-to-face and remote learning.

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