Using Game-Based Learning in Developing Metacognition among ESP Students: A Case Study

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Abstract: Undergraduates in higher education institutions in developing countries are often required to enroll in courses like English for Specific Purposes, to enhance their English language proficiency in different disciplines. Other than language learning, these courses are also designed to develop cognitive skills. One of these is metacognition, which concerns an individual's cognitive capabilities to plan, execute, monitor and evaluate tasks, and that needs to be developed and strengthened at tertiary levels of education prior to embarking on a career. To that end, a digital simulation game was introduced as supplementary material for an ESP (Business English) class during a semester, with the aim of facilitating and developing metacognitive awareness and strategy use as well as foster incidental language learning. This qualitative case-study explores the learners' experiences with using the digital simulation video game The Sims 4: Get to Work (Retail) to support their learning of Business English and develop their metacognition. Findings revealed that learners displayed declarative knowledge, procedural knowledge, and conditional knowledge of metacognitive processes during the game play, and indicated ability to regulate their cognitive processes to achieve the business goals of the retail simulation game, while using Business English. Implications of these findings suggest that the implementation of simulation game-based learning is highly beneficial for students, enabling them to develop both their metacognitive skills and communication within ESP contexts.

Keywords: English for Specific Purposes, game-based learning, metacognition

## 1.	Introduction

Depending on the bachelor's degree programme registered in the university or higher education institutions (HEIs) in developing countries, undergraduates may be required to enroll a course to enhance their English language proficiency in their respective fields of interest (Ahmed, 2014; Muniandy & Shuib, 2021; Ulucay & Demirel, 2011; Zhang, 2021). This course is widely known as English for Specific Purposes (ESP) (Ahmed, 2014; Muniandy & Shuib, 2021; Trang & Phuc, 2020; Ulucay & Demirel, 2011; Zhang, 2021). Other than improving English language proficiency, ESP is

necessary for undergraduates to show good command of the English language when applying for jobs or seeking scholarships (Trang & Phuc, 2020). Generally, undergraduates need to attend lectures and tutorials for at least one semester in this particular course.

ESP is divided into two main branches, which are further divided into sub branches as individual courses offered in HEIs (Ahmed, 2014).Each branch of ESP caters for different professions (Ahmed, 2014). The first branch of ESP is English for Academic Purposes (EAP), which concerns developing undergraduates to be professionals in the academic platform (Ahmed, 2014). Several individual courses offered in EAP are the English for Science and Technology (EST), English for Legal Purposes (ELP), English for Medical Purposes (EMP), and English for Management, Finance and Economics (EMFE). The second branch of ESP, known as English for Occupational Purposes (EOP), concerns developing undergraduates for occupational purposes. The sub-branches of individual courses under EOP are English for Business Purposes (EBP), English for Pre-Vocational Purposes (EPVP), and English for Vocational Purposes (EVP). It should be noted, however, that EMP can also be an individual course offered as EOP.

Metacognition

In Malaysia, undergraduates are expected to acquire soft skills, higher-order cognitive skills, and metacognition (Hamid et al., 2014; Ma'dan et al., 2020). Specifically, in handling assignments and examinations (Rhodes, 2019; Young & Worrell, 2018), but also to be professional in the prospective workplaces upon completing their bachelor studies (Hamid et al., 2014; Rahmat et al., 2016). Furthermore, working in the 21st century demands potential employees to demonstrate high levels of metacognition. The ability to analyse strengths and weaknesses, and formulate and implement solutions to overcome learning difficulties is not only a crucial element of successful learning, but also an indicator of potential future career performance (Lyons & Bandura, 2019). Underscoring its significance further, workplace metacognition training is conducted as a means of enhancing self-efficacy and adaptive performance in order to collectively achieve organisational goals (Joie-La Marle et al., 2023; Varghese, 2020). Thus, prospective employees should show capabilities to make plans, establish goals, demonstrate knowledge in the field, and make appropriate decisions for solving tasks (Hamid et al., 2014; Rahmat et al., 2016; Ma'dan et al., 2020).

Unfortunately, research has indicated that employers found incompetent workplace performance among university graduates, despite the years of study and training (Hamid et al., 2014; Rahmat et al., 2016; Ma'dan et al., 2020). In fact, several organisations have reported concerns about achieving sufficient and satisfactory performance in key performance indicators (KPI) (Rahmat et al., 2016). Rahmat et al. (2016), in relation to the unsatisfactory performance of graduate students from university, raised caution about the lack of employability skills that resulted in decreased employment opportunities.

In order to address employers' concerns regarding graduate employees' performance, this study proposed the use of game-based learning to develop metacognitive skills among undergraduate students. The present research was also conducted in light of finding more suitable approaches to teaching ESP, as urged by scholars (see Lee, 2018; Muniandy & Shuib, 2021; Trang & Phuc, 2020; Ulucay & Demirel, 2011). Hence, specifically, the researchers employed game-based learning in ESP classrooms and examined the undergraduates' perceptions concerning metacognition at the end of game-based learning.

2. Conceptual Framework

The present research is conceptually framed using social constructivism in acquiring metacognition among undergraduates through game-based learning. Social constructivism, a theory developed by Lev Vygotsky drawing influence from Jean Piaget (Franco & DeLuca, 2019; Harrison & Laco, 2022; Watt & Smith, 2021), posits learning in a socio-cultural context, wherein individuals develop an understanding towards the world through social interaction (Muniandy & Shuib, 2021; Watt & Smith, 2021). Proponents of social constructivism advocate its significance in encouraging individuals to be active during the learning process (Muniandy & Shuib, 2021; Watt & Smith, 2021; Vivakaran & Neelamalar, 2018). Individuals are expected to explore knowledge while interacting with

each other, which simultaneously leads to meaningful collaboration among individuals, subsequently developing teamwork to achieve common goals (Watt & Smith, 2021). Harrison and Laco (2022) added more benefits of learning using social constructivism. Accordingly, individuals, especially students, get to experience satisfaction based on the end result or product of the learning (Harrison & Laco, 2022; Vivakaran & Neelamalar, 2018). The continuous interaction between students allows them to develop shared values and become critical thinkers (Harrison & Laco, 2022). Significantly, it should be noted that teamwork, other than developing knowledge, is considered a necessary skill in the 21st century.

The construction of knowledge, as advocated in social constructivism and from the researchers' point of view, is one of the goals that overlapped between game-based learning and metacognition. Proponents of metacognition believe individuals are cognitive beings capable of demonstrating various kinds of knowledge competencies while being aware of their personal strengths and limitations (Pelton, 2019; Rhodes, 2019; Teng & Zhang, 2021; Young & Worrell, 2018). There are three forms of knowledge in metacognition, which are (1) declarative knowledge, (2) procedural knowledge, and (3) conditional knowledge (Pelton, 2019; Rhodes, 2019; Teng & Zhang, 2021; Young & Worrell, 2018). The following summarises the explanation of each knowledge from the literature on metacognition: Declarative knowledge concerns an individual's capability to process incoming information, especially when there is a task involved. The individual is aware of his or her capabilities and can anticipate the performance to accomplish the task. Procedural knowledge concerns an individual's capability to apply existing understanding and skills in solving tasks. Conditional knowledge concerns an individual's capability to employ strategies according to the tasks' conditions and requirements. The individual is expected to make decisions that best meet the tasks' objectives.

However, skepticism abounds regarding the feasibility and applicability of acquiring information and constructing knowledge through playing games (Barbetta, 2022; Karagiorgas & Niemann, 2017; Nadolny et al., 2017; Yi et al., 2020). Nevertheless, given the prevalence of video games in the current digital world, as an individual seeks entertainment and leisure in the gameplay, knowledge is disseminated through the real-world contents designed and displayed in games (Barbetta, 2022; Karagiorgas & Niemann, 2017; Nadolny et al., 2017; Yi et al., 2020). Game-based learning, with the aid of rapidly developing technology, has brought in a new method of learning in the education platform, bringing new approaches towards learning and pedagogy in contemporary society (Barbetta, 2022; Karagiorgas & Niemann, 2017; Vivakaran & Neelamalar, 2018). The sociocultural contexts available in games enable individuals to be exposed to new knowledge or recognise the familiarities between in-game contexts and real-world settings. From a social constructivist perspective, individuals engaging in games are constantly exposed to new knowledge while simultaneously they are required to apply existing knowledge to solve tasks and quests. The highly interactive nature of games, along with multiplayer functions, enables collaboration among individuals to apply and develop knowledge throughout the gameplay while fostering collaboration with each other (Karagiorgas & Niemann, 2017; Yi et al., 2020).

Another nature of game-based learning, through a social constructivism lens, is that learning of new contents is done with minimal guidance (Harrison & Laco, 2022). Social constructivism posits the essence of the learning process among students. Given the minimal to no instructions from a guide, which can be referred to as the teachers in classroom settings, students who engage in game-based learning are pushed to make professional decisions. Evaluating to know the rights and the wrongs as they solve tasks in the game makes learning become meaningful, further developing professionalism in making judgements (Harrison & Laco, 2022). The process of making professional judgements becomes increasingly meaningful when teamwork is involved (Harrison & Laco, 2022; Watt & Smith, 2021). As mentioned, students developed shared values when interacting as a team to solve tasks (Harrison & Laco, 2022; Watt & Smith, 2021). Within the process of developing shared values, making professional judgements involves students appreciating each other's thoughts and perspectives (Franco & DeLuca, 2019). In simpler explanations, game-based learning enables students to make professional decisions by collaborating, appreciating each other's opinions, and solving tasks through minimal guidance (Franco & DeLuca, 2019; Harrison & Laco, 2022; Watt & Smith, 2021). The emphasis of game-based learning, from a social constructivism lens, is learner-centred learning (Lee, 2018; Muniandy & Shuib, 2021; Franco & DeLuca, 2019).

Apart from gaining knowledge, metacognition also involves the regulation of cognition, which concerns a series of activities requiring individuals to manage learning and tasks (Pelton, 2019; Rhodes,

2019; Teng & Zhang, 2021; Young & Worrell, 2018). The five activities in the regulation of cognition are (1) planning, (2) information management strategies, (3) comprehension monitoring, (4) debugging strategies, and (5) evaluation. In planning, individuals identify the goals based on the task assigned. They then make use of the knowledge available to manage the information given in the task. Once the information of the task is processed, individuals engage in comprehension monitoring, wherein they check whether the strategies employed to understand and interpret tasks are properly used. Debugging strategies are involved when individuals make corrections or adjustments to the strategies used to understand tasks. Lastly, evaluation involves the individuals to evaluate and assess the performance made in solving tasks. This is to determine whether the procedures to handle the tasks are effective and if the tasks' objectives are successfully achieved. However, from a social constructivism perspective, the five forms of regulation of cognition can also include a collaboration of individuals as teamwork is essential not only in HEIs but also at the workplace. The three activities in regulation of cognition, which are comprehension monitoring, debugging strategies, and evaluation, involve individuals to make reflection on the knowledge and strategies employed (Pelton, 2019; Rhodes, 2019; Teng & Zhang, 2021). These processes are coherent to social constructivism, wherein individuals need to reflect on their learning as well.

Thus, we posit that metacognition and game-based learning are intertwined as the three forms of knowledge and five forms of regulation of cognition in metacognition are involved as individuals seek entertainment through games. The intertwining between metacognition and game-based learning is present in literature conducted on this field in other contexts (e.g., Castronovo et al., 2018; Scoresby & Shelton, 2014). Nevertheless, in the ESP context, the researchers believe that learning to be professional in specific fields during the lectures should not be done in a one-way, teacher-centered manner, a static form of learning frequently criticised in the literature. Instead, learning can be interactive, as social constructivism posits, through the use of game-based learning. Within the learning process, undergraduates can further develop the necessary domains in metacognition, which can be highly useful as prospective employees in the future workplace.
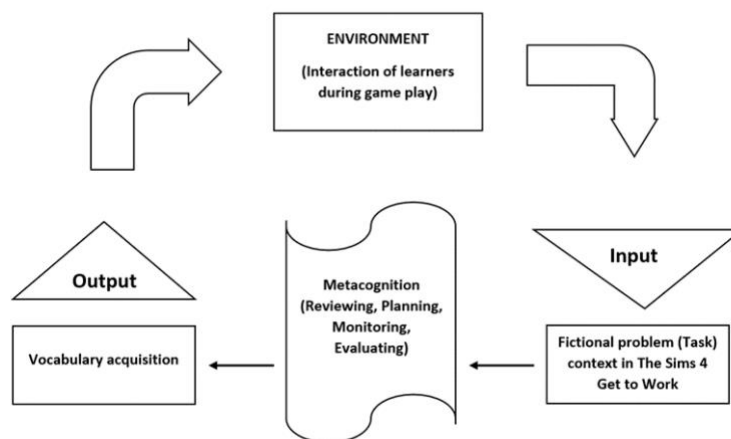

Fig.1 Conceptual Framework

3. Research Methodology

This study is part of a larger study concerning developing language proficiency and metacognition of ESP undergraduates in higher education institutions. However, to narrow the scope, a qualitative case study approach is used to determine the ESP undergraduates' views of learning ESP-related content through game-based learning, specifically on metacognition.

3.1   Creating a Bounded System

A qualitative case-study involves researchers to deeply dwell into a phenomenon of interest (Frey, 2018; Merriam, 2009). However, unlike most qualitative research, while the general goal is to provide rich and in-depth data concerning a phenomenon of interest (Leavy, 2017; Merriam, 2009), a case-study method shows distinction to other qualitative research methods, wherein it is not bound to any fixed specific research instruments to gather data (Frey, 2018; Merriam, 2009). Rather, the researcher seeks to understand the phenomenon in an in-depth manner by choosing the research instruments that best meet the research objectives (Frey, 2018; Merriam, 2009).

Merriam (2009) notions the use of a bounded system to define the case as specifically as the researcher can before conducting a case study. Accordingly, the bounded system informs the unit of analysis based on the phenomenon of interest. More specifically, it is not about the topic of the research. Rather, the bounded system concerns the actual entity or the "what" that needs to be researched (Merriam, 2009). Drawing Merriam's (2009) explanation of a bounded system, the unit that needs researching, in the present research, is the process of learning in game-based learning. More specifically, the metacognition displayed by ESP undergraduates as they learn the contents of ESP in game-based learning.

3.2   Data Collection and Analysis

To conduct the case study, a group of ESP undergraduates from a private HEI located in the state of Selangor, Malaysia, was purposely recruited for the research. The institution offers the course, English for Business (EFB) to undergraduates pursuing a bachelor's degree in business, accounting, and/or commerce. To maximise the credibility of the selection of research participants, two inclusion criteria must be fulfilled: (1) The undergraduate must be an existing, registered student pursuing a bachelor's degree in any said field aforementioned, and (2) the undergraduate is enrolled in EFB at the time of the research is conducted. In the present research, a final total of 25 undergraduates from EFB were recruited.

The business field is best reflected in the video game, The Sims 4: Get to Work, which is one of the research instruments used in the present research. Accordingly, the EFB course is aimed at developing undergraduates in an all-rounded manner in the business field. This involves understanding and using business-related terms, employing relevant business-related skills at markets, and delivering effective presentations in business settings. The aims of EFB are, to the researchers' opinions, best reflected in The Sims 4: Get to Work. In the video game, players are required to create their avatars and engage in daily activities highly similar to real-life contexts. To localise the video game to the business context, the researchers create a business environment in different phases during the gameplay wherein players were required to complete the task given in each different phase. In Phase 1, players need to establish a retail store including selecting the location of the retail store, hiring employees, selecting the sales percentage, and price markup for the items in the retail store. In Phase 2, players make decisions on the best marketing strategies and manage their employees. Players were given tasks on handling business operation and expansion such as managing employee's attitude, performance of sales and expansion of their business in Phase 3.
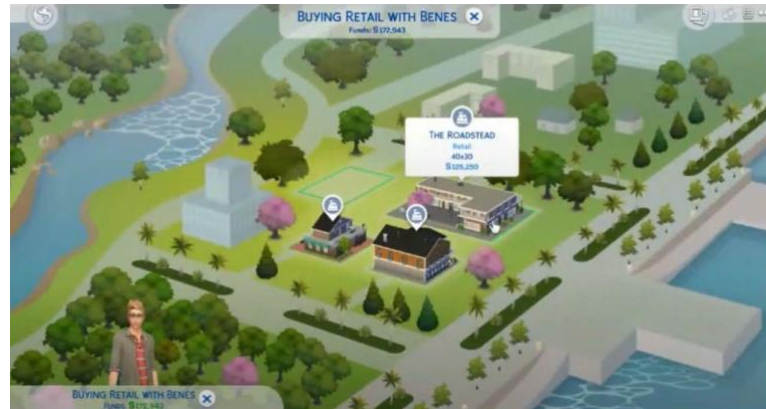
Fig.2 Select Location of The Retail Store

Fig.3 Setting the price for sales items.

Fig.4 Hiring Employees for Retail Store

The undergraduates were divided into five groups, with each group having five members. Then, they experienced a 90-minute gameplay session in The Sims 4: Get to Work between January and March of 2021.

At the end of each gameplay session, focus group discussions were conducted to understand the undergraduates' experience during the gameplay. As the gameplay sessions were held in the group form, using focus group discussions served as the best method to understand how the group functioned to achieve all the aims of the video game set by the researchers. Further, the use of focus group discussions allows researchers to capture authentic and natural discussions and conversations between

participants, which allows the researchers to understand the participants' experience (Frey, 2018; Merriam, 2009). In the present research, the focus group discussions were conducted on Google Meet after all gameplay sessions were conducted. However, to avoid undergraduates from becoming confused with the interview questions, questions employed in the focus group discussions are carefully worded to exclude jargon and technical terms as employed in the present research.

Thematic analysis was used to analyse the data from focus group discussions. Specifically, Braun and Clarke's (2006) six steps of conducting thematic analysis were referred as this form of thematic analysis is widely used by many scholars for qualitative research in different fields (e.g., Edwards et al., 2020; Gådin & Stein, 2017; Lester et al., 2020). In thematic analysis, researchers are able to produce insightful data by identifying emerging and complex patterns (Edwards et al., 2020; Gådin & Stein, 2017; Lester et al., 2020). The end result of using thematic analysis helps produce a vivid interpretation of data that best answers a research question (Edwards et al., 2020; Gådin & Stein, 2017; Lester et al., 2020). Accordingly, the six steps as outlined by Braun and Clarke (2006) are (1) familiarising with the data, (2) generating initial codes, (3) searching for relevant themes, (4) reviewing the themes identified, (5) defining and naming the themes, and (6) reporting the themes. To ensure trustworthiness of themes, the researchers compared the findings with each other until a common decision was achieved for the presentation of themes.

4. Findings and Discussion

Two major themes were identified based on the thematic analysis conducted. Table 1 displays the classifying of themes. Accordingly, two major themes were developed based on the two components of metacognition, which were knowledge of cognition and regulation of cognition.

Table 1. Themes Identified

Main Themes	Sub-Themes	Evidence from the interview
Knowledge of Cognition	Declarative Knowledge	"We understand the goal is to run the retail store. It's like running a store in (the) real life. Of course, we need to earn some money to survive… There are many words that are related in our field are used in the game too, so these help us to understand what are the specific details in the store we need to pay attention to."
	Procedural Knowledge	"I think we have to tend to their needs. Because in real life, employees who are not taken care of will definitely quit (resign) from the company (retail store). Like, if the employees are sick or in need of rest, when we see the signs appearing on their (avatars) heads, we need to make sure they are taken care of. If it were I who is sick but I am not allowed to get a leave, I will definitely not commit to the company."
	Conditional Knowledge	"Uh… The customers wanted different things when they came to our store. We have to do some research to check what the trend is and import the necessary stocks. Or else, we will lose the customers. This is similar to our real life. There are always things that people want, so we need to make sure we are up to date with the trends, or else we will lose in the market."

Main Themes	Sub-Themes	Evidence from the interview
Regulation of Cognition	Information Management Strategies & Planning	"We have to do some research to check what the trend is"
		"For example, although we have hit the target in the store we are running, we checked the profits gained and since there was some time left, we decided to continue operating the store to go beyond the expected income."
	Comprehension Monitioring, Debugging Strategies and Evaluation	"We know what to sell in the store, but sometimes we realise the products offered to the customers aren't suitable (meeting their needs) just like in real life. When we reflect, we consider the possibility of the location of the store where it is located (in the game). We also consider how willing the customers are to purchase products from our stores."
		"The sales report further give us the needed information how we can improve based on the strategies we used. This is because in (real) life, there is no definite strategies that guarantee success in business. We need to look at our performance and come to better decisions to solve the problems."

Theme 1: Knowledge of Cognition

During the focus group discussions with each group, the undergraduates perceived themselves to have displayed all three forms of cognitive knowledge in metacognition. These three forms of cognitive knowledge are declarative knowledge, procedural knowledge, and conditional knowledge. For declarative knowledge, many undergraduates agreed that they understood clearly the aims of the game, and they were aware of what to do when running the retail store in the game. An example of a quote about displaying declarative knowledge was shown in the following:

> "We understand the goal is to run the retail store. It's like running a store in (the) real life. Of course, we need to earn some money to survive… There are many words that are related in our field that are used in the game too, so these help us to understand what are the specific details in the store we need to pay attention to." (Group 2)

As a part of the game was to hire employees to run the retail store, the undergraduates informed that they knew how to ensure the staff employed remained loyal to the store. This part of the game involves undergraduates displaying procedural knowledge, wherein they need to apply the knowledge learned to situations. An example of a quote from Group 4 was shown in the following about how they hired and attended to the employees in the game.

> "I think we have to tend to their needs. Because in real life, employees who are not taken care of will definitely quit (resign) from the company (retail store). Like, if the employees are sick or in need of rest, when we see the signs appearing on their (avatars) heads, we need to make sure they are taken care of. If it were I who is sick but I am not allowed to get a leave, I will definitely not commit to the company." (Group 4)

Although it is not explicitly stated, the quote from Group 4 reflects the undergraduates' understanding of how to run the retail store, especially in terms of concerning the well-being of the

employees hired. Running a retail store in the game required the undergraduates to ensure the stocks were available and the customers' needs were met. As the availability of stocks and customers' needs were constantly different, the undergraduates had to display conditional knowledge, wherein to employ strategies according to the situations that arose. An example of a quote where undergraduates believed themselves to have shown conditional knowledge is shown in the following:

> "Uh… The customers wanted different things when they came to our store. We have to do some research to check what the trend is and import the necessary stocks. Or else, we will lose the customers. This is similar to our real life. There are always things that people want, so we need to make sure we are up to date with the trends, or else we will lose in the market." (Group 1).

Theme 2: Regulation of Cognition

Regulation of cognition concerns the steps or activities taken to manage the tasks at hand. During the focus group discussions with each group, the undergraduates perceived themselves to have demonstrated the activities related to the regulation of cognition. With reference to Group 1's quote concerning conditional knowledge, planning and information management strategies were involved as the group members were making plans to decide how to expand the business while generating income. Accordingly, the group members did some research to check the trends of products customers preferred in the game, "We have to do some research to check what the trend is" (Group 1). By doing some research on customers' preferences in the game, as the group members claimed, it also suggests that the group members were managing the information using strategies, which in this case refers to conducting market research.

However, other groups have also displayed different kinds of information management strategies. In the following quote provided by Group 5, they decided to continue the retail store despite the fact they have generated incomes that have sufficiently met the goal of game-based learning.

> "For example, although we have hit the target in the store we are running, we checked the profits gained and since there was some time left, we decided to continue operating the store to go beyond the expected income." (Group 5)

Throughout the gameplay sessions with the undergraduates, the participants responded in the focus group discussions concerning the strategies employed and evaluations made. Accordingly, the three activities of regulation of cognition in metacognition were involved, which were comprehension monitoring, debugging strategies, and evaluation. During the focus group interviews, several undergraduates exemplified these activities by drawing real-life experiences, as seen in the following.

> "We know what to sell in the store, but sometimes we realise the products offered to the customers aren't suitable (meeting their needs) just like in real life. When we reflect, we consider the possibility of the location of the store where it is located (in the game). We also consider how willing the customers are to purchase products from our stores." (Group 2)

From the quote, it can be seen that the group members were monitoring their store and attempting to understand the situation of their business. The use of the word "reflect," indicates the undergraduates employed debugging strategies to understand the marketing strategies employed when running the retail store.

> "The sales report further give us the needed information how we can improve based on the strategies we used. This is because in (real) life, there is no definite strategies that guarantee success in business. We need to look at our performance and come to better decisions to solve the problems." (Group 2)

While it is not explicitly stated, the quote from Group 2 suggests that evaluation has taken place when the group members operate the retail store in the game. Accordingly, they seek methods to

improve the strategies employed, and they also look at their performance in the workplace. It should also be noted that they draw real-life experiences wherein they perceive running a business in the real world does not come with definite strategies. Hence, there is a need for them to evaluate themselves to further generate income.

The quotations exemplified clearly indicate the presence of metacognition among the ESP undergraduates during the gameplay session. What needs to be further emphasised is the constant use of the "we" pronoun during the focus group discussions with the undergraduates. From a social constructivism point of view, the presence of collaboration among the undergraduates is present as they interact with the game. This also subsequently means that teamwork is formed within the groups, and the group members work together to strive for a common goal, which in the present research refers to generating the necessary profit and hiring employees. Additionally, the inclusive "we" indicates continuous interaction between group members, and ideas, opinions, and thoughts among the members are suggestively shared and appreciated, which is a notion of social constructivism (Franco & DeLuca, 2019; Harrison & Laco, 2022; Watt & Smith, 2021).

The familiarity undergraduates experienced strongly suggests that they brought real-world experiences into the video game to run the retail stores. This strongly confirms the nature of game-based learning, wherein the settings and contexts of the games mimicked real-life environments to stimulate authentic learning (Barbetta, 2022; Karagiorgas & Niemann, 2017; Nadolny et al., 2017; Yi et al., 2020). The frequent attempts to connect real-life examples to in-game contexts in terms of running the stores led the undergraduates to understand how knowledge can be applied between the two worlds. Since the in-game environment is familiar to the undergraduates, the experience of running a virtual retail store becomes meaningful, which is one of the significances of game-based learning. The field-specific words, as mentioned by the undergraduates in the focus group discussions, further inform the authenticity of learning that has taken place in the virtual world. It should be noted that the employment of field-specific words when solving tasks in the game strongly indicates achieving the goal of attending ESP courses, which is to develop language proficiency in specific fields (Ahmed, 2014; Zhang, 2021). Nevertheless, significantly, having game-based learning integrated in ESP courses is seemingly effective as the undergraduates are shown to employ the knowledge learned in the video game.

From a metacognition perspective, the quotations exemplified from the groups indicate the presence of knowledge of cognition and regulation of cognition among undergraduates. The ESP undergraduates seem to be able to disseminate the knowledge they possess and apply relevant strategies as they run the retail stores to meet the goals. The reflections made in the process of running the retail stores, as mentioned by the undergraduates, indicate the undergraduates are able to understand their strengths and weaknesses as they employ strategies to generate income. This subsequently means that the undergraduates are aware of their capabilities as learners in ESP classrooms, and they have taken steps to compensate for the weaknesses they identified during the gameplay sessions.

Using a case-study approach and following the bounded system established, the goal of the present research is to understand the process of learning among ESP undergraduates. In this context, findings reveal the learning process to acquire knowledge in the ESP context can be meaningful through the use of game-based learning. The video game, The Sims 4: Get to Work, simulates real-world business platforms for the undergraduates to employ the knowledge gained in the ESP course. Learning from undergraduates' responses becomes highly interactive and authentic as they engage in the video game. It is not bound to the traditional, one-way manner of learning, which is a call by many scholars concerning the disuse of traditional methods for ESP (Lee, 2018; Muniandy & Shuib, 2021; Trang & Phuc, 2020; Ulucay & Demirel, 2011). Rather, there is a constant application of knowledge and skills in a video game context mimicking real-world situations. Following the undergraduates' responses in the focus group discussions, it can generally be concluded that they have a positive experience learning ESP content in game-based learning. The opportunity to learn through the video game in this research also enables them to display metacognition, which the three forms of knowledge and five different activities are crucial for them to display professionalism in the prospective workplaces after completing their studies.

Given the significance of game-based learning, the researchers thus strongly recommend ESP course designers and coordinators, and ESP lecturers to integrate game-based learning into the syllabus, which is also acknowledged widely by other scholars (e.g., Barbetta, 2022; Karagiorgas & Niemann, 2017; Nadolny et al., 2017; Yi et al., 2020). The rationale does not merely result in applying knowledge

and showing relevant skills to understand the contents of ESP among ESP undergraduates, but it also enables the undergraduates to learn in a student centred learning environment (Muniandy & Shuib, 2021), which is highly recommended across educational institutions in contemporary society. As for game developers, they can make use of the experience described by the undergraduates in this research to design more games that include and mimic real-life experiences (Castronovo et al., 2018). Game developers can design games to provide not only informative content useful for real-world situations but also to integrate metacognition aspects into the games to further develop learners' metacognition (Castronovo et al., 2018). Generally, given the trends of using technology to promote learning, game developers can incorporate necessary content in video games to stimulate authentic learning in ESP (Muniandy & Shuib, 2021).

5. Conclusion

ESP is a course offered in higher education institutions. The necessity of this course is to provide undergraduates with the relevant skills and knowledge that are needed in the prospective workplaces upon graduating from the institutions. Through a qualitative case-study approach, findings revealed that the undergraduates from ESP did demonstrate all three forms of cognitive knowledge, and they perceived themselves to engage in the five activities in the regulation of cognition.

However, while the present research is significant to ESP lecturers and course coordinators for future reference, further recommending the use of game-based learning in ESP classrooms, it is not without its limitations. Firstly, the branches of ESP are rather wide, as introduced in the literature. The present research only covers those who are from the business field, and the video game introduced is situated in a business context. As such, the findings may not necessarily be transferable to other ESP-related contexts, such as ELP and EMP. Future researchers interested in this field may consider altering the context of the video game to best meet the realities of ESP-specific fields to obtain relevant data. Another limitation that needs to be addressed is that the research is conducted amidst the COVID-19 pandemic, wherein all educational institutions in Malaysia are required to close temporarily and learning is shifted from physical lessons to online learning (e-learning). While the lockdown amidst the COVID-19 pandemic is gradually lifted, the highly controlled environment to reduce the spread of the virus has resulted in a lack of observation to be conducted on the research participants from the researchers' point of view. As such, the data obtained may not be rich enough to be reported in terms of the actual experience faced by the undergraduates in this research. Furthermore, the researchers recognise the research is conducted in only one HEI. The findings do not necessarily generalise to other undergraduates pursuing similar fields from other HEIs. There is a need to expand and replicate similar research in other institutions.

6. Co-Author Contribution

The authors affirmed that there is no conflict of interest in this article. All authors contributed equally in carrying out the field work, preparing the literature review, and overseeing the writeup of the whole article.

7. Acknowledgements

8. References

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