Student-material Interaction in Online Learning during the COVID-19 Pandemic

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Abstract

Student-material interaction is crucial for the learning process. It is even more critical when online teaching is conducted during the COVID-19 pandemic because students are supposed to be more independent and autonomous in online learning. However, few studies have been conducted to examine how students interact with their materials outside the classroom. The current study explored student-material interactions through a survey and semi-structured interviews at a university in Vietnam. Materials were classified into three types: compulsory, recommended but not mandatory by teachers, and self-selected materials. Participants were 62 tertiary students who studied English as a compulsory subject at the selected institution in the North of Vietnam. Findings showed that students mainly read/listened/viewed materials, did some exercises, and discussed with their peers, while they did not engage in deeper analysis, such as analysing and creating similar materials. Students perceived that they understood the lessons with a low level of cognition. In addition, students reported that obtaining reasonable scores was the highest motivation for interacting with materials. The study suggested that teachers should have more instructions for students to interact with materials, and the process of interacting with materials should be a part of the assessment.

Keywords: *student-material interactions, online teaching, online learning, motivation, educational psychology*

Introduction

When teaching online, teachers normally have to organize three different types of interactions: teacher-student, student-student, and student-material, as Moore (1989) suggested, to engage students in their learning. Many researchers have widely studied teacher-student and student-student interactions (Diep et al., 2019; Keskin et al., 2020; Moorhouse, 2020). The remaining type of interaction, student-material interaction, however, has not received much attention (Xiao, 2017). This is concerning since student-material interactions have a positive relationship with learning outcomes. It is arguable that the more time students spend on the course materials, the better the learning outcome they achieve (Zimmerman, 2012). To date, a number of studies have indicated that students valued their interaction with the content (Rodriguez & Armellini, 2013). For example, it was reported that interaction with the content motivated them to learn (Li et al., 2016) and that there was a close relationship among e-learning content, e-learning quality, and students' satisfaction (Kumar et al., 2021b). However, these studies did not describe what kinds of content students interacted with. Other studies showed that students skimmed the content to complete the task, but they did not digest materials in detail (Jarvis et al., 2013), or they accessed the learning materials but did not submit tasks (Martín-Monje et al., 2018). However, these studies did not point out how students interacted with materials and perceived their learning progress. In addition, during the pandemic, most of the teachers only asked students to read materials without further checking whether they had read those materials or not (Le et al., 2022). In Vietnam, Thach (2018) reported factors affecting online interactions during the online course, but he has not pointed out how students actually interacted with online materials. Another study (Le et al.,2022) reported that teachers sent students materials to read before synchronous meetings, and some of them checked whether students read them or not through quizzes. However, these teachers did not organize activities that required students to write reflections and analyse materials to develop students' critical thinking skills (Le et al., 2022). It is largely unknown about how students interacted with learning materials in online learning, especially during the COVID-19 pandemic. The current study examined how students interacted with materials, perceived their knowledge attainment, and their motivation for interacting with materials.

Literature review

Student interactions which can be classified into three major categories of student-teacher, student-student, and student-materials are crucial in online teaching and learning environments (Moore, 1989). Student-teacher interaction is the communication between the student and the teacher who presents the lesson, organizes activities, and motivates students (Anderson, 2003; Anderson & Garrison, 1998; Moore, 1989). Student-student interaction is the synchronous and asynchronous discussions among students to construct meaning, give feedback and collaborate in a learning environment (Anderson, 2003; Mehall, 2020). Student-teacher interaction is how teachers facilitate the content and assess student learning (Wilson & Stacey, 2004). In online teaching, however, students are supposed to interact with materials and study independently (Lindgaard, 2019).

There was an interrelationship among the three types of interactions (Xiao, 2017). Many studies have been conducted to examine student-teacher interactions, learner-learner, and learner-content interactions (Ertmer et al., 2011; Garrison & Cleveland-Innes,

2005; Li et al., 2016; Rodriguez & Armellini, 2013). These interactions have been recorded to improve students' cognitive development (Bernard et al., 2009). Student satisfaction was reported to link student-teacher interaction (Sher, 2009). However, these types of interactions were not equally essential (Anderson & Garrison, 1998). For instance, students perceived teacher-student and student-content were more important than student-student interaction (Kyei-Blankson et al., 2019). Dunlap et al. (2007) suggested balancing different activities, considering different format options for student-student interactions (video, and other stuff), and using all three types of interactions.

Learners' Material Interaction Models

Of the three types of interaction, learner-material interaction is regarded as a "defining characteristic of education in that 'it is the process of intellectually interacting with content that results in changes in the learner's understanding, the learners' perspective, or the cognitive structures of the learners' mind" (Xiao, 2017, p. 2). *Student-content interaction* is "the process of intellectually interacting with the content that results in changes in the student's understanding, the student's perspective, or the cognitive structures of the student's mind" (Moore, 1989, p. 2). Turoff et al. (1994) further explained that students interact with materials to link what they know and do not know. Anderson and Garrison (1998) describe student-material interaction as active engagement between the learner and the materials to learn something new. Ally (2008) suggested that students could interact with materials by reading, listening, viewing, researching, journaling, applying, practicing, and summarizing materials. The current study adopts Ally's model for student-material interactions to investigate how students interacted with their materials because Ally's suggestions cover all the activities such as reading/listening/viewing, research, journalizing, applying, practising and summarising materials that students could do. Ally's model for interacting with content is a general one. The study adopted this model of interactions for three different types of materials in this current study: compulsory, recommended, and self-selected materials.

Previous Studies on Student-material Interactions in Online Environments

A number of studies (Guohua Pan et al., 2012; Nandi et al., 2015) have been conducted to investigate online student-content interaction. The quality of the online materials had a positive effect on student satisfaction. In a fully online course, university students from Australia reported that the course structure such as organization, usability, navigation, and course management affect their interaction with the content (Nandi et al., 2015). In addition, learner-material interaction directly affected students' perceived progress (Lin et al., 2017). The students were also reported to access only course materials that they perceived to be directly tied to earning a good grade (Murray et al., 2012). High access rates are associated with high grades. Student recollections and perceptions of their access to course resources align closely with actual access rates, as verified within the LMS system (Murray et al., 2012). In addition, technology tools such as learning management systems promoted the interaction between students and digital content (Owusu-Agyeman & Larbi-Siaw, 2018).

In another study in a blended learning context, Le Roux and Nagel (2018) reported that their participants viewed videos many times before class, which enabled them to

understand the lesson better. The study, however, only examined how many times students viewed the videos but did not report whether students had taken notes or discussed with their friends about the videos. Another study concluded that the more students interacted with the course content such as videos, reading materials, or quizzes, the higher outcomes students achieved (Zimmerman, 2012). Although the study used a learning management system to track how much time students spent on the course, it did not reveal how they interacted with materials. Garrison and Cleveland-Innes (2005) even pointed out that interaction was not enough for cognitive development, especially deep learning, because if students did not discuss critical thinking questions, they would not develop their deep learning. Ertmer et al. (2011) analysed the questions and student responses in online discussion forums. The study findings revealed that higher levels of the questions facilitated the higher levels of students' responses. Questions were seen as an essential tool to promote critical thinking skills, however, critical thinking did not automatically occur.

During the COVID-19 pandemic, Derakhshan et al. (2021) reported that teachers mainly lectured, which created boredom for the online class, and students did not have many interactions with their peers. The study also did not report how students interacted with their materials before and during class time. Another study concluded that students used different digital tools to interact with materials and did some simple tasks such as gaining some ideas for online writing (Umamah & Cahyono, 2022). However, the study did not point out what kinds of materials were and how they interacted with materials.

It should be noted that the above studies were conducted in America or Canada, where students were reported to have a higher level of autonomy. On the contrary, students in Asian countries like Vietnam are often reported to be passive and to expect teachers to tell them what to do (Bui, 2019). In addition, the curriculum limits students and lecturers to exercise their autonomy because lecturers have to follow it strictly (Bui, 2019). In Vietnam, only Thach (2018) reported the findings of students' perceived usefulness of online materials and their confidence in using all the online materials. However, Thach (2018) did not examine how students interacted with online materials. Besides, Le et al. (2022) reported that teachers sent students materials to read, but most of them did not organize activities for them to read and did not check whether they read the materials or not. Since then, no further studies have been published about students' interaction with online materials in the Vietnamese context. So far, little research about how students interact with materials has been conducted, especially in Vietnam where students are described as very passive.

Methodology

The study aimed to explore how students interacted with their materials and their level of cognition after reading materials, and their motivation for interacting with the materials. The materials in this current study are classified into three sub-categories: compulsory materials, recommended materials, and self-selected materials. The study sought answers to the following questions:

1. How do students interact with online materials when studying online?

2. Which perceived cognitive levels do students attain when interacting with materials?

3. What motivates students to interact with online materials?

The study used mixed methods with the questionnaire and the interview, combining quantitative and qualitative data to examine the situation better (Creswell, 2014; Dörnyei, 2007). The questionnaire explored students' interaction with three different types of materials, their cognitive levels, and their motivation. The interview was to explore further how students interacted with materials, whether they understood the materials after interacting with them, and their motivation for reading materials because qualitative data could be useful in exploring students' experiences (Harvey-Jordan & Long, 2001).

Participants

The research participants were 62 Vietnamese university students who consented to take part in the study and completed the questionnaire. These students were second and fourth-year students who studied English phonetics and phonology courses. There were nine males and 52 females, while one student identified himself as 'other.' Their English levels were identified as A2 according to the Common European Framework of Reference (CEFR) (Council of Europe, 2001) or at the pre-intermediate level (19 students - accounting for 30.5% and B2 – upper-intermediate level (40 students – accounting for 65%). The rest of the students had other levels of English like A1 or B1. In other words, students were at the elementary level – A1 and intermediate level for B1. Four participants for the interview were randomly selected from those who agreed to take part in the interview and they provided their contact details in the questionnaire.

Sampling Procedure

The study employed a convenient sampling technique in which the researchers contacted their colleagues who taught English-majored students to ask for students' participation in the survey. Among around 150 students contacted, sixty-two students agreed to participate in the study and completed the questionnaire.

Data Collection Instruments

Materials were classified into three types: compulsory, recommended, and self-selected materials. Compulsory materials are the ones that the instructors require students to read at home, while recommended ones are the materials that teachers recommend for students to read further but do not require reading. Materials that students found themselves are self-selected materials. The study adapted Ally (2008)'s framework in which he suggested operationalizing student-material interaction as the activities of reading, listening, viewing, journalizing, summarizing, practicing, applying, and researching the materials. Therefore, these activities were adapted to the questionnaire items in the survey to examine whether students did all these activities while interacting with the materials.

In terms of the level of cognition, after reading/listening to or viewing materials, the study employed Bloom's Taxonomy on the levels of learning (Bloom et al., 1964), which includes six levels of cognition: remembering, understanding, applying, analysing, and evaluating. The questionnaire also examines students' motivation to interact with materials such as scores or teacher's request, or their interest in the subject.

The questionnaire has three parts (Appendix 1). Part 1 examines personal information such as year of study, English level, and age. Part 2 has three sections, and each section has 13 question items. Each section examines how students interacted with materials and whether they understood them. Part 3 has five items eliciting students' motivation for interacting with materials The survey was designed and delivered on Google Forms to get students' responses.

Semi-structured individual interviews (Appendix 2) were conducted to clarify what kinds of materials students were required to read, how they interacted with materials, and what they could learn after reading materials. The interviews also aimed to further explore students' motivation for interacting with materials, elaborating on what students chose in the questionnaire. All interviews were conducted and video-recorded on Zoom. Each interview was about 20 minutes long.

Validity and Reliability

To ensure the validity of the survey, all the researchers discussed with each other about item by item as well as the overall structure of the survey until a final agreement was reached. The survey was then piloted with two students in the form of cognitive interviews. Students were asked to think aloud while answering the questions. They were also asked to give comments on the wording clarity of each item, the organisation of the questions, and the interface friendliness to enhance the cognitive standards and usability standards (Groves et al., 2009). The pilot survey helped to remove a duplicated question and estimated the amount of time needed to complete the survey (approximately 10 minutes). To check instrument reliability, the survey was then piloted with 24 other students. A high value of Cronbach's alpha indicates high reliability (Groves et al., 2009). The Alpha coefficient value for students' opinions in the pilot survey was .89, indicating a good level of reliability. The interview questions were also piloted to ensure questions were easy to understand and did not include any ambiguous terms.

The questionnaire is written in both Vietnamese and English for students to understand it easily. Google Forms was used to get students' responses to the survey. The questionnaire was sent to students by one of the teachers on the research team. It took students around 10 minutes to complete the questionnaire online.

The final version was sent to the respondents who completed the questionnaire with personal contacts and invited them to participate in the interview. Only four students voluntarily participated in the interviews.

Data Analysis

The quantitative data were descriptively analysed on how students interacted with materials, and what levels of cognition they could achieve and what motivated them to interact with materials. For qualitative data, thematic analysis (Charmaz, 2014) was used to examine how students interacted with different types of materials, their cognitive level,

and their motivation for interacting with materials. In this process, the interview was transcribed and coded according to three main themes, which are guided by the questionnaire's focuses as follows: student interaction with materials, cognitive levels after the interaction, and motivation.

Findings

The results are presented in section 4.1. Section 4.2 elaborates on the results of the second research question on the cognitive level, and section 4.3 presents findings on the motivation for interacting with materials.

Students' Interaction with Materials
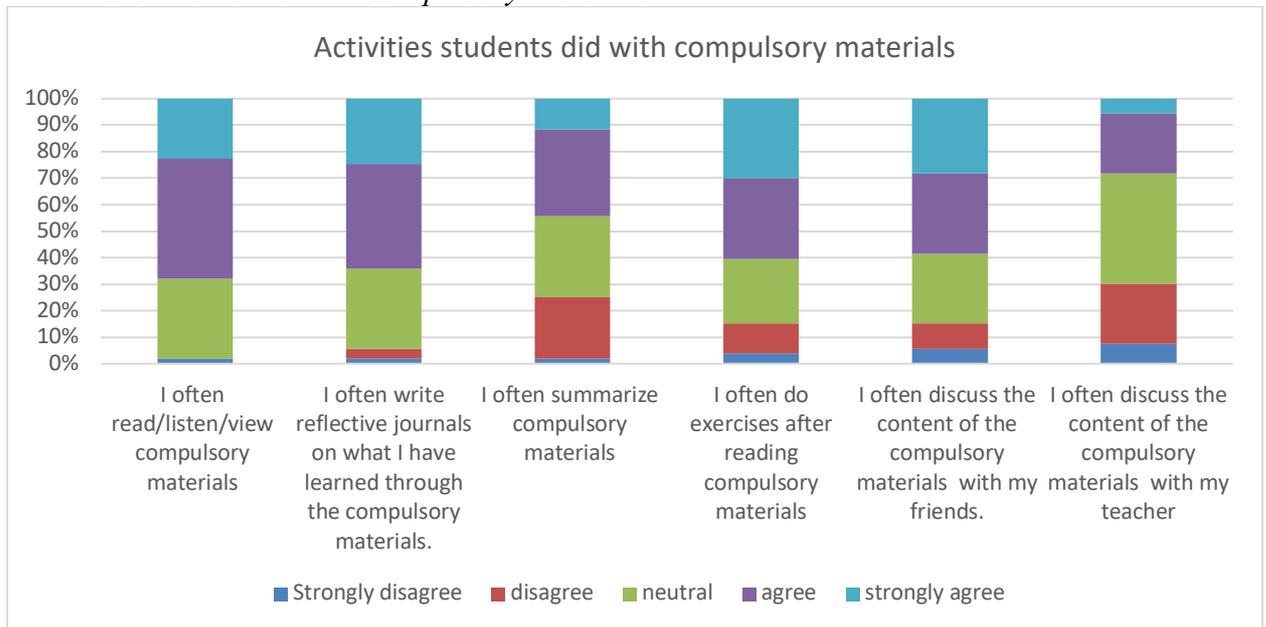
Compulsory Materials

The findings showed that three popular materials that students accessed were textbooks, lecture notes, and Powerpoint slides. Figure 1 showed that most of the students (51 out of 62)… provide a percentage,   accessed books, lecture notes, and Powerpoint slides. Only a few students (less than 20%) used handouts (materials that teachers prepared for students, e.g., worksheets), workbooks, and lesson plans.

Figure 1
Types of Compulsory Materials
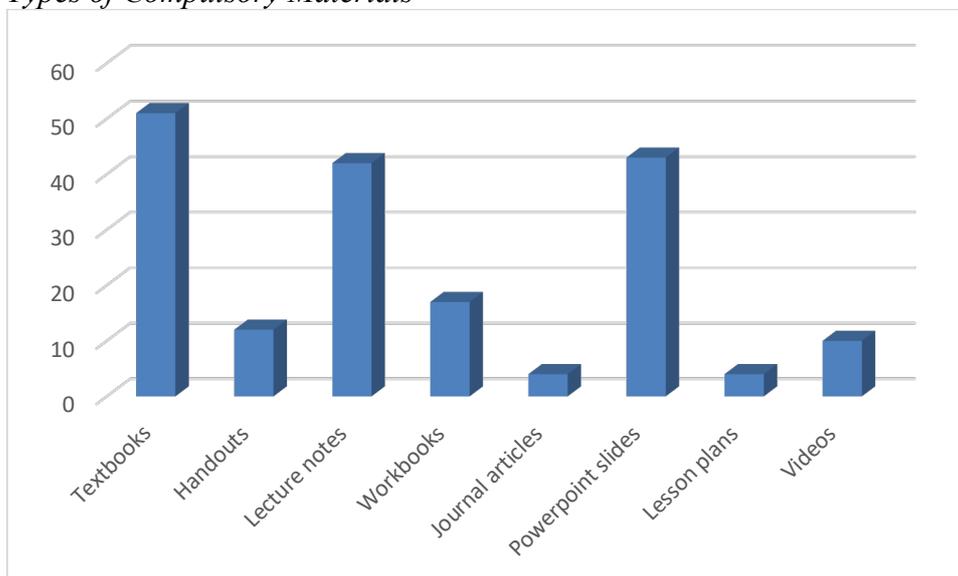
In terms of the first research question as to how students interacted with materials, Figure 2 showed that over half of the students (more than 60%) read compulsory materials (i.e., Powerpoint slides), wrote reflective journals, did exercises, and discussed with their friends. However, some students (less than 40%) often summarized the content of the compulsory materials, and less than 30% often discussed it with their teachers.
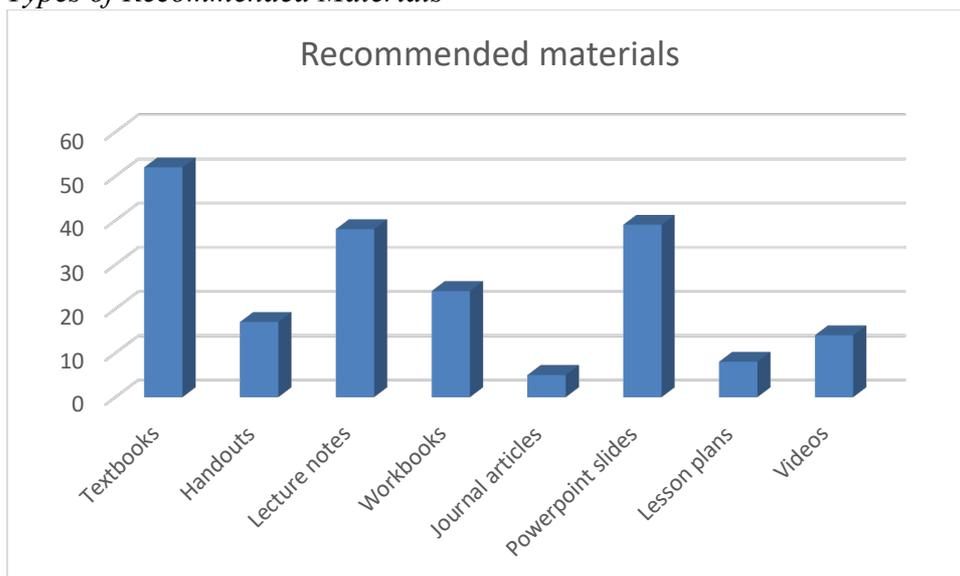
Figure 2
Activities Students did with Compulsory Materials


Recommended Materials

Figure 3 shows a similar trend between compulsory and recommended materials. Three types of materials popular among the students were textbooks, Powerpoint slides and lecture notes, standing at 83%, 63%, and 61%, respectively. Other types of recommended materials such as handouts, workbooks, and videos were less common.

Figure 3
Types of Recommended Materials

With recommended materials (e.g., recommended books), Figure 4 indicates that more than 60% of the students often listened to/viewed the materials, wrote reflective journals, did exercises, wrote reflective journals, and discussed the content with their friends, which is similar to the compulsory materials. About 30% of the students often summarized recommended materials and discussed them with their teachers. The number of students who interacted with materials was similar to that figure for compulsory materials.

Figure 4

Activities Students Did with Recommended Materials
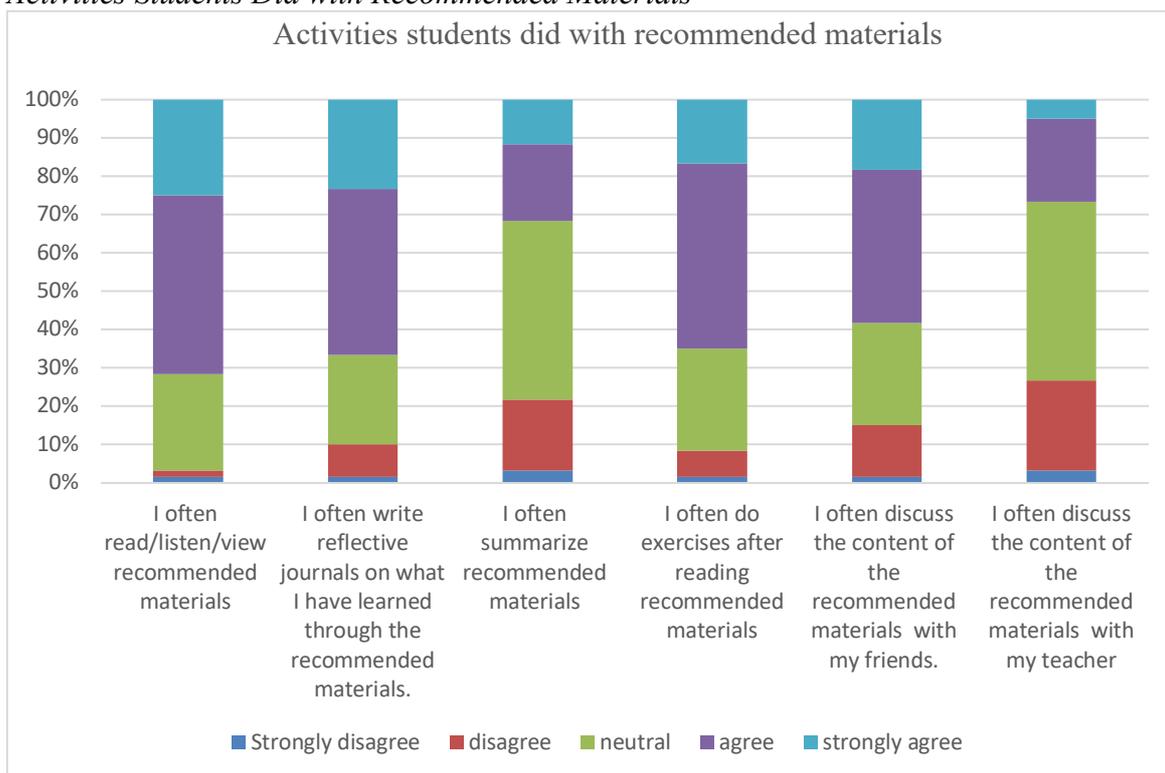

Self-selected Materials

Not many students interacted with self-selected materials as they did with the other types of materials. Figure 5 shows that less than half of the students self-selected their textbooks to read, while less than a third of the students searched for other materials, such as videos or Powerpoint slides.

Figure 5
Types of Recommended Materials
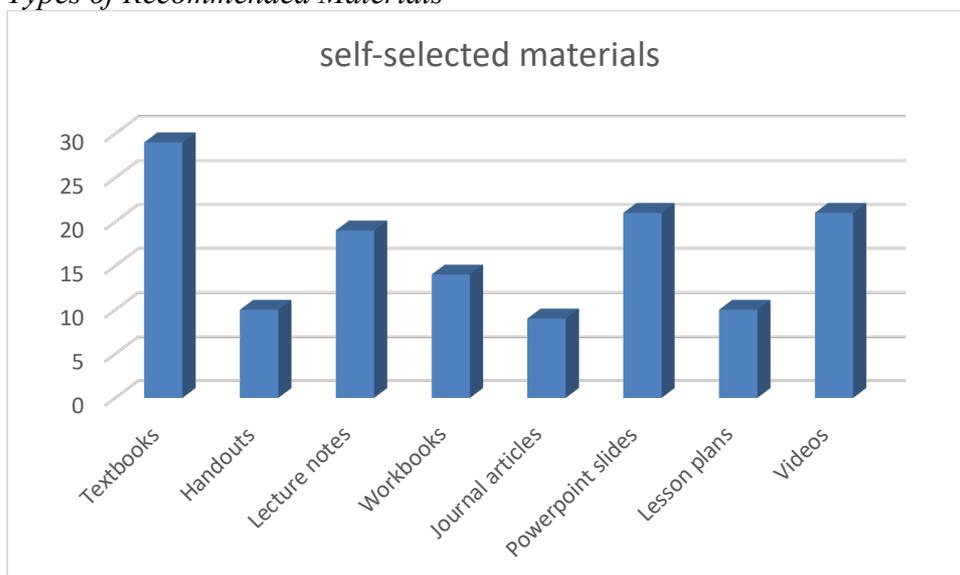
For compulsory and recommended materials, teachers required or recommended them for students to read. However, over two-thirds of the students searched for self-selected materials that were not suggested by the teacher and interacted with them. Only two-thirds of the total number of students who completed the questionnaire reported that they searched for and self-selected materials to read, listen, or view. Figure 6 showed that among the students who looked for online materials, about 60% of them also read/listened/viewed, wrote reflective journals, did exercises, and discussed with their friends. The figures for summarising and discussing with their teachers was 42% and 18%, respectively.

Figure 6
Activities Students Did with Self-selected Materials

Activities students did with self-selected materials
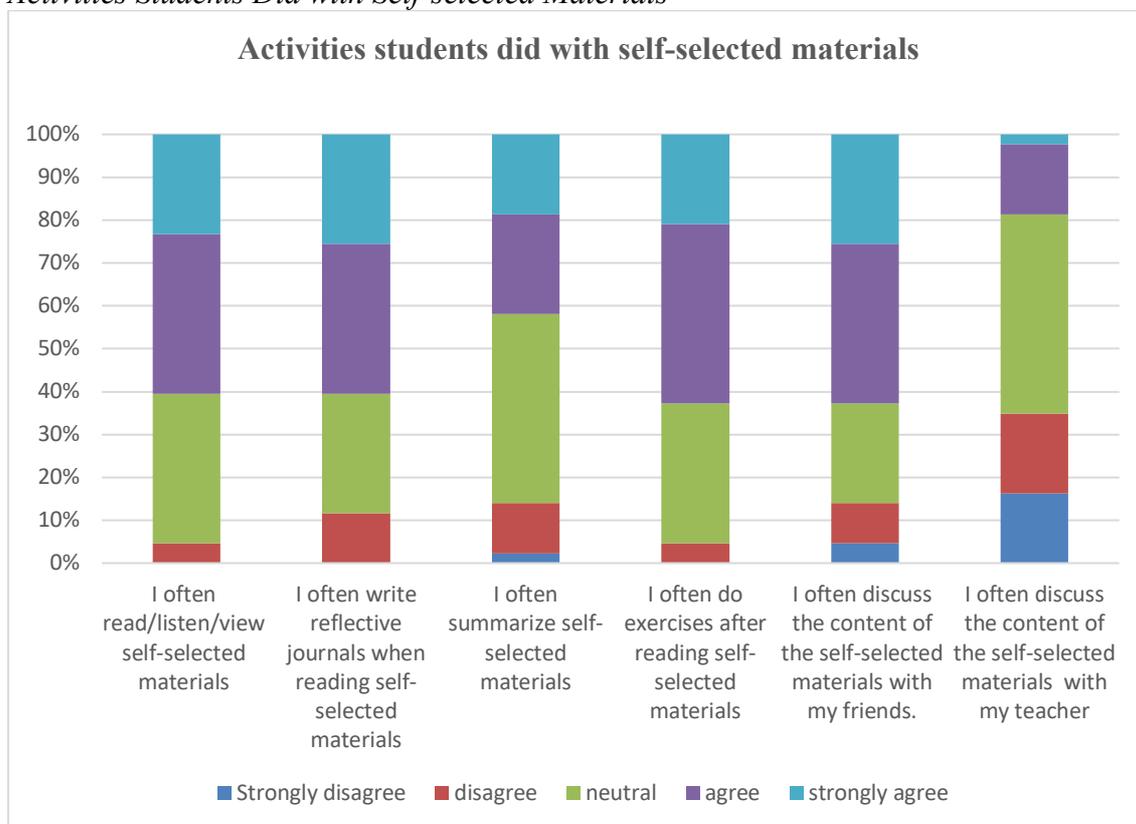
Interview Results

The findings in the semi-structured interviews presented similar results as found in the questionnaire data. Most students read or viewed materials assigned by the teachers. For example, one student reported that he tried to read the materials quickly to learn what he would study for the next class as he said, "I only skim-read the section that I will study" (Student D - pseudonym). One of the reasons that he explained for his quick reading is that the materials took too long to read; therefore, he only "read the PowerPoint slide" because these slides were "concise and succinct"; however, he explained that the Powerpoint slides he had were from the same course which was delivered previously. He also added that he tried to find a video on YouTube about pronunciation so that he could practise his pronunciation.

> I only watched the video [on YouTube], which teaches how to pronounce some sounds, because they help me learn better. (Student D)

Some students tried to complete exercises after each lesson. As reported, the teachers did not ask them to complete the exercises before the class. Some students were more willing to complete the work assigned but not autonomously because they only read materials if their teachers requested them to do so. Student D further explained that if his teachers asked him to do exercises, he would feel compelled to do them.

Most of the students tried to complete the teachers' homework. If teachers only asked students to read materials only, students would not read them as much as when teachers assigned them homework *(Student D)*.

In addition to reading/viewing the materials, students also had other types of activities to interact with the materials. For example, one underlined the important content while he was reading "I highlighted the main ideas to remember" (Student C). Another student tried to discuss the content with her peers, especially when teachers gave them the test. However, most students did not want to discuss it with their teachers because they were afraid of their teachers. One of the students explained that she "did not read the materials carefully*"* (Student C), so she did not dare to ask her teacher for further explanation. One of the students reported that he did not understand the materials very well; therefore, he had to translate them into Vietnamese to better understand the materials that teachers gave him. One student reported that he "only translated from specific terms into Vietnamese." This is because some students had quite a low language proficiency such as elementary or pre-intermediate as they reported in the questionnaire. These students might have to translate into Vietnamese to understand the textbook to comprehend it. With regard to the summarizing activities*,* one of the students (Student A) said that his peers and himself 'seldom summarized' (Student A)*.* However, one of the students reported that he 'studied new vocabulary' (Student B) when he found some new words.

In summary, the interview data revealed that students would only read/listen/view materials very quickly unless their teachers asked them to do otherwise. They did not interact with materials carefully to analyse them to have a deeper understanding on their own.

Cognitive Levels after Interacting with Materials

This section answers the second research question regarding the cognitive levels after interacting with materials. According to Bloom et al. (1984), there are six levels of cognition: remembering, understanding, applying, analysing, evaluating, and creating. Figure 7 shows that around 60% of the students reported that they understood and applied the exercise after reading compulsory materials. Less than 30% of the total respondents reported that they could analyse and evaluate the materials. The number of the students who could remember the materials was well under 40% although remembering is a low level of cognition.

Figure 7
Cognitive Levels after Interacting with Compulsory Materials
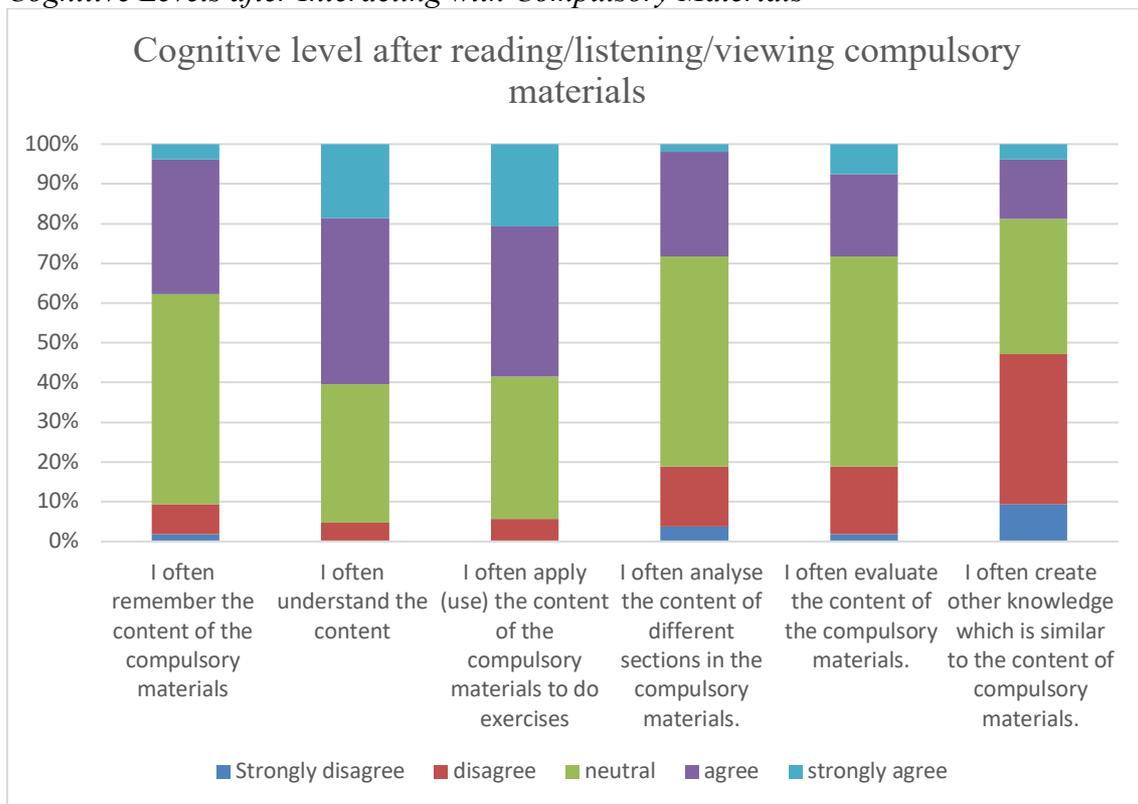

Figure 8 showed that around 60% of the students tried to complete the exercises for recommended materials. However, less than 50% of the students agreed that they understood the materials when interacting with them. For a higher level of cognition, only a third analysed materials; a quarter evaluated materials, and about 15% of the students created other materials to have deep learning.

Figure 8
Cognitive Levels after Interacting with Recommended Materials
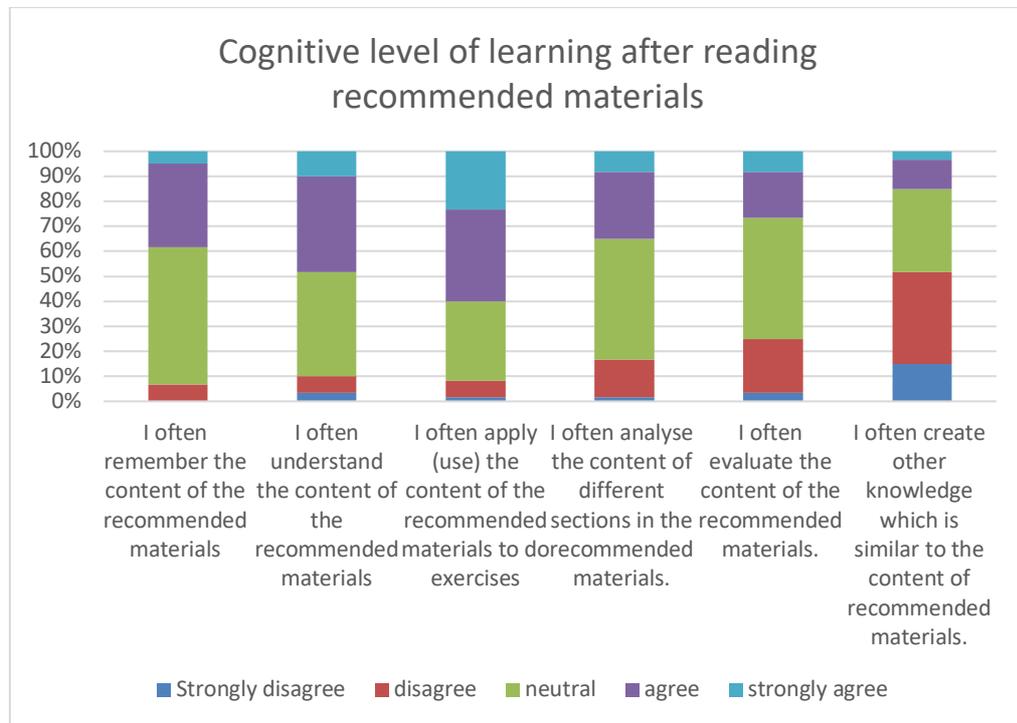
For the self-selected materials, the level of cognition is a little bit lower than the compulsory and recommended ones. Less than 60% of the students applied the content in the materials to do exercises, while just over 40% could remember the materials. The number of students who could achieve a higher level of cognition is relatively low—around 30% of the students analysed and evaluated the materials that they could find on the internet.

Figure 9

Cognitive Levels after Interacting with Self-selected Materials
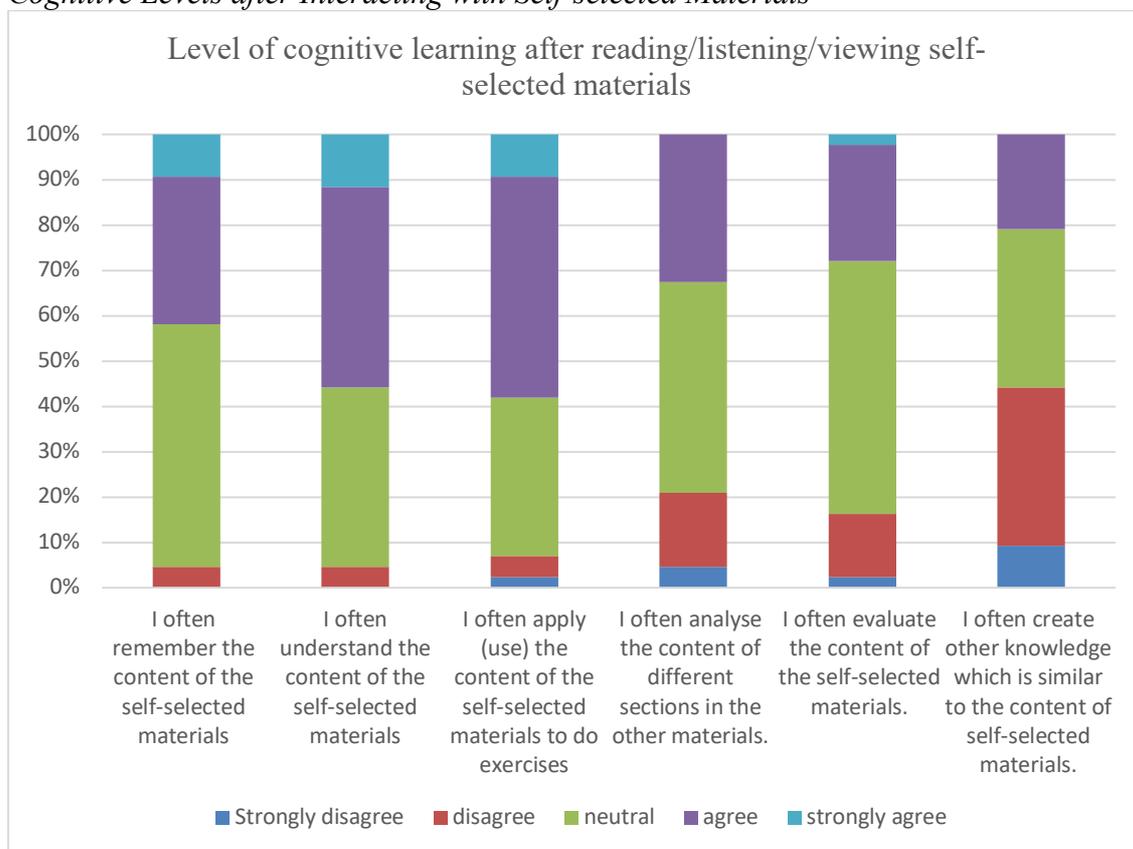

Findings from the interviews supplement the survey results. Students reported not fully understanding learning materials after interacting with them. One of the students confessed, "I did not fully understand the compulsory materials. I only understood about 60%" (Student D). One of the students explained that he had to study the materials three times before fully understanding the lesson: "I read once before the class, and then the teacher presented again. After that, I self-studied again; then, I could understand the lesson" (Student A). One explained that the subjects had many technical terms, and the content was unfamiliar to them. Although he was a fourth year-student, he said that the teacher explained everything in English, which made it difficult for him to understand the lesson. Student A also did not read the materials carefully, so that he also could not understand the lesson well. One of the students said that she "remembered a part of the whole lesson, not all the lesson" (student C). For a higher level of cognition, most students replied that they did not analyse or compare materials because they did not fully understand the content of the lessons. One of the students said, "I did not analyse or evaluate the materials" (Student C).

In summary, students reported that they did not fully understand the materials they interacted with. They only partially remembered, understood, and applied the lesson's content. For a higher level of cognition, most of them reported that they did not achieve the levels of material analysis or evaluation.

Students' Motivation for Interacting with Materials

Concerning the third research question relating to the motivation for interacting with materials, Figure10 shows that there were the two strongest factors motivating students to read/listen/view materials. The first factor is to get higher scores; this motivation was reported by almost 90% of the participants. The second reason is to complete the course's task. About 85% of the students reported that they interacted with materials to complete the tasks assigned by their teachers or to get higher scores. A little less than 60% of the students reported interacting with materials because of teachers' requests. Only about 30% of the students agreed that they read materials due to their interest in or love of the subject.

Figure 10
Motivation for Interacting with Materials
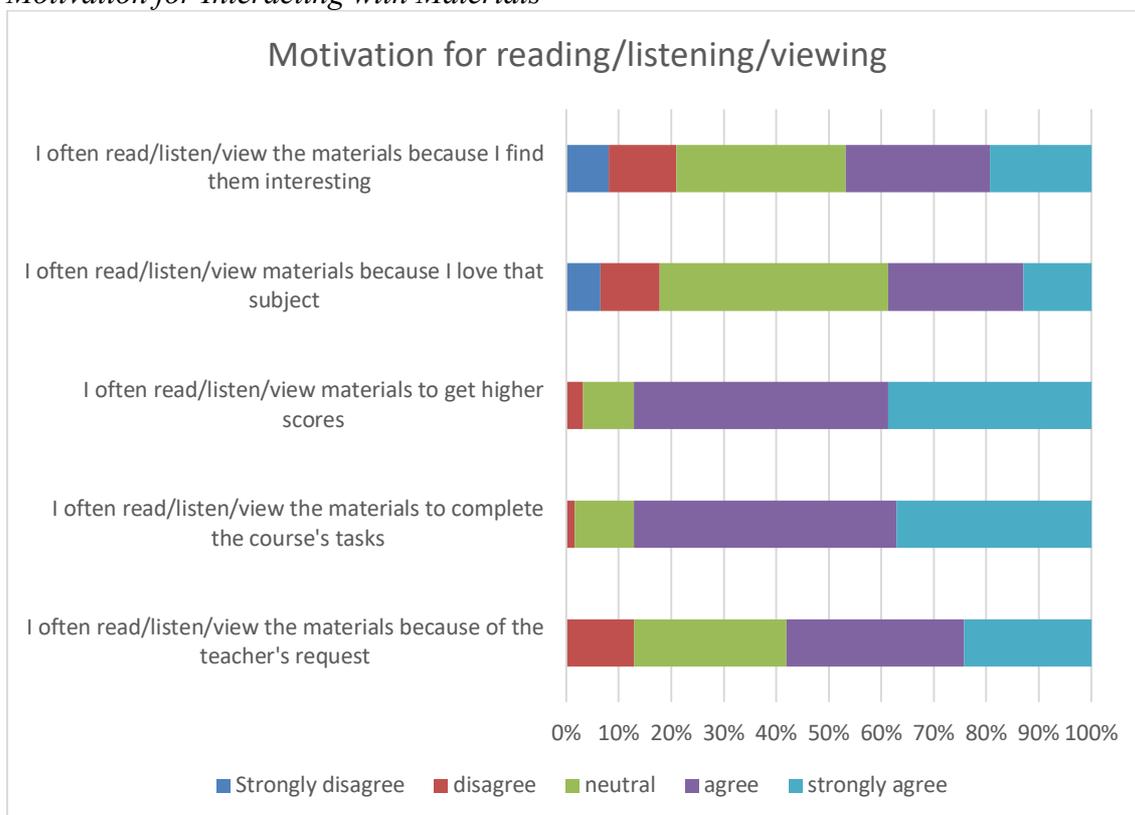
The interview data also showed that students felt compelled to read materials because they wanted to complete the teacher's assignment. As one of the students reported that most of the students tried to learn to get good marks; therefore, if teachers asked them to do exercise and assessed their homework, they would try to complete the tasks. One of the students explained, "Most students studied because of their grades, so if teacher's assignments are a part of the assessment, that will be a good way to encourage students to study online" (Student D).

As a result, they only tried to study what was related to the exam and did not. explore self-selected materials, for example student C stated "I think I only studied the exam questions." Only one student was interested in the subject and

wanted to know more about his future job; "I think it is useful for my job"' he said (Student B).

Discussions

Students' Interaction with Materials

The findings showed that students mainly read/listened/viewed, did exercises, and discussed materials with their peers. Those are only three out of six activities, -- reading, listening, and viewing, researching, journaling, applying, practicing, and summarizing materials, as suggested by Ally (2008). Most of them did not summarize or discuss the content of materials with their teachers. In this course, teachers did not facilitate students to interact with materials although compulsory materials are a kind of compulsory reading list. As revealed in the students' interview, teachers only gave students materials to read at home without assigning their students any follow-up tasks or checking whether students read or not. As a result, most of them read materials as quickly as possible. The findings are similar to what Le et al. (2022) found that most of the teachers did not check whether students interacted with their materials or not or set up activities that could develop students' critical thinking when reading materials. The current study findings are in line with what Umamah and Cahyono (2022) described students' using digital tools to complete some simple tasks as soon as possible without deep analysis. As Nandi et al. (2015) pointed out, course organization and management directly impacted students' interaction with materials; therefore, it might be the teachers who did not organize and manage activities for students to do. Teachers in this study did not manage students on the LMS and did not have activities to check whether students read materials or not. Another reason is that participants in the current study were from Vietnam, and those students are often described as passive, and they expect their teachers to tell them what to do (Bui, 2019). Students in this study also reported that they would be more motivated to read materials if teachers assigned them every day and checked them. It is therefore recommended that teachers organize further activities when teachers ask students to interact with materials, and a proportion of assignment completion should be a part of assessment so that teachers could encourage students to interact more with materials. For example, teachers could give students bonus marks if they spent more time interacting with course content and doing the assigned quiz. As Zimmerman (2012) pointed out that the more time students spent on their materials, the better would be learning outcomes; therefore, teachers in the research context should design relevant activities for students.

Our results suggest that students' interaction with materials does not occur automatically but needs to be facilitated with teachers' guidance and support. In addition, a digital-mediated learning environment like a learning management system could improve the interaction between students and digital content because it could transfer information among the students in the community (Owusu-Agyeman & Larbi-Siaw, 2018). Therefore, the study recommends that teachers should use a learning management system to check students' interaction with materials. For example, teachers could check whether students read/viewed/listened to materials and completed their task or not. After that, teachers could award some percentage of the final grade for student-material

interaction activities because students were reported to interact more with materials associated with the final test and assessment (Murray et al., 2012).

Cognitive Levels after Interacting with Materials

The findings showed that most students reported that they did some exercises while reading materials and partially understood the materials. Dubuclet et al. (2015) found that question design and participation requirements directly impacted students' cognition. However, in this case, the teachers only asked students to read materials without giving further guiding questions; therefore, most of the students only read/viewed/ watched materials quickly without developing higher-order thinking skills such as analysing, evaluating, and creating new materials. As Garrison and Cleveland-Innes (2005) pointed out, a higher level of cognition does not occur without facilitation. In the current study, students did not develop a high level of cognition because teachers did not guide them sufficiently to develop their levels of understanding of the materials, and students did not try to achieve a higher level of cognition when they did not read materials carefully. The findings from the current study confirmed that higher levels of cognition such as analysis and evaluation need further facilitation because these high levels of cognition would lead to deep learning and develop critical thinking skills. Indeed, Garrison and Cleveland-Innes (2005) claimed that interaction was not enough for cognitive development. In addition, Ertmer et al. (2011) found that questions that were designed to elicit higher levels of earning would facilitate higher levels of students' responses. Questions are an important tool to promote a higher level of cognition, however, a high level of cognition does not occur automatically. Therefore, the study suggested that teachers' support is essential to enable students to develop their higher level of cognition. For example, teachers can create open forums with higher-order thinking questions so that students can develop their high-order thinking skills. Another suggested measure is that teachers could let students write reflective journals in which students have to summarize the content and show their opinions.

Students' Motivation to Read Materials

The current study showed that examination preparation and getting higher marks were students' primary motivations to interact with the content materials. The findings are in line with the results from the study by Zimmerman (2012), who reported that students spent more time on materials associated with the examination. It is also consistent with Murray et al. (2012)'s finding that students only assessed materials that help them to improve their course grades. The study added to the literature that passive students in Vietnam did not automatically interact with their materials. These students need teachers to motivate them to interact with their materials. Therefore, to enhance students' motivation in interacting with course materials, it is necessary to adjust assessment techniques (e.g., more formative assessments) or scoring scales (e.g., more weight given to creative work or performance). The current study's findings may also be explained by the fact that the material content was designed in a limited way that did not enhance students' interest and intrinsic motivation. As Taghizadeh and Ejtehadi (2021) revealed in a recent study, the teacher's lack of experience and pedagogical knowledge of online learning may make the course materials being not interactive and interesting

enough to students. The finding may inform policymakers and the education sector to pay more attention to professional development for more effective online teaching and interaction.

Conclusion

This study has added to the limited research on learner-material/content interaction in the second language field, especially during the COVID 19 pandemic. Its results showed that most of the students read/listened/viewed materials, did the exercises, and discussed with their friends; however, they only interacted with materials quickly and on the surface levels. They were not deeply engaged with the learning materials. Therefore, they achieved limited levels of cognition. In addition, students were more motivated to read materials related to the assessment and at teachers' requests rather than for their own interests. Therefore, teachers should manage student interaction with materials during their online teaching, especially by promoting higher levels of interaction such as analysis and evaluation. These types of evaluations could be done through the online forum designed with critical questions.

The study recommends that teachers take more active roles in facilitating students' interaction with learning materials. For example, teachers should set up some formative quizzes for students to do after interacting with materials to check their understanding. In addition, more open questions should be given to students so that they could have more discussions and develop their higher levels of cognition after reading materials. Furthermore, teachers can award students points for final assessment if students are active in interacting with their learning materials.

This study has some limitations that need to be acknowledged. First, it did not investigate whether the students' material interaction has any relationship with the learning outcomes at the end of the course although the study did examine the level of cognition that students achieved during their reading. In addition, the students reported that they did read materials quickly, but the study could not confirm whether students interacted with all the materials or only a part of the materials that teachers assigned to them. The study also involved a small sample size in an institution; therefore, its results may not be representative of Vietnamese students' interaction with their learning materials. Future research is thus encouraged to replicate the current study with a large population sample to determine the study's generalisability to other similar contexts.

Acknowledgments

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Appendix 1

Questionnaire

Part 1: General information

1. Gender
a. Male   b. Female   c. Other
2. Year of birth:
3. Which year of study are you in?
a. First year   b. Second year
c. Third year   d. Fourth year
4. What is your English level?
a. A1 or equivalent to A1
b. A2 or equivalent to A2
c. B1 level or equivalent to B1
d. B2 level or equivalent to B2
e. C1 level or equivalent to C1
f. C2 level or equivalent to C2

Part 2: Detailed questions about how students interact with materials/Phần 2 – Câu hỏi chi tiết về cách sinh viên tương tác với tài liệu như thế nào?

There are three types of materials: Compulsory/core materials (materials that teachers ask you to read), support materials (materials that teachers recommend but not require you to read), and ancillary materials (materials that you find them by yourself).

A. Compulsory materials or core materials/Tài liệu bắt buộc
1. Are there compulsory materials for this subject?
a. Yes
b. No
2. What are the compulsory materials that your teacher asks you to read/listen/view?
a. Textbooks   b. Handout
c. Lecture notes   d. Workbooks
e. Journal articles   f. Powerpoint slides
g. Lesson plans   j. Videos
h. Others ……… (Please specify)

Opinion	Strongly Disagree	Disagree	Neutral	Agree	Strongly agree
1. I often read/listen/view these compulsory materials.	1	2	3	4	5
2. I often write reflective journals (take notes/ comments/underline key points) when I read/listen and view these compulsory materials.	1	2	3	4	5
3. I often summarize these compulsory materials.	1	2	3	4	5
4. I often complete activities provided after reading/listening/viewing to these compulsory materials.	1	2	3	4	5
5. I often discuss the content of the compulsory materials with my friends.	1	2	3	4	5
6. I often discuss the content of the compulsory materials with my teachers.	1	2	3	4	5
7. I often do other activities with these compulsory materials (Please specify).	………………..				

B. Perceived outcomes after reading/listening/watching compulsory materials

	Strongly Disagree	Disagree	Neutral	Agree	Strongly agree
1. I often remember the content of the compulsory materials after I read/listen/view them.	1	2	3	4	5
2. I often understand the content after I read/listen/view compulsory materials.	1	2	3	4	5
3. I often apply (use) the content of the compulsory materials to do exercises/activities.	1	2	3	4	5
4. I often analyse the content of different sections in the compulsory materials.	1	2	3	4	5
5. I often evaluate the content of the compulsory materials.	1	2	3	4	5
6. I often create other knowledge which is similar to the content of compulsory materials.	1	2	3	4	5

Recommended materials

1. Are there recommended materials for this subject?
a. Yes
b. No
2. What are the recommended materials that your teacher asks you to read/listen/view?
a. Textbooks   b. Handout
c. Lecture notes   d. Workbooks
e. Journal articles   f. Powerpoint slides
g. Lesson plans   j. Videos
h. Others ……… (please specify)

Opinion	Strongly Disagree	Disagree	Neutral	Agree	Strongly agree

1. I often read/listen/view these recommended materials.	1	2	3	4	5
2. I often write reflective journals (take notes/ comments/underline key points) when I read/listen and view these recommended materials.	1	2	3	4	5
3. I often summarize these recommended materials.	1	2	3	4	5
4. I often complete activities provided after reading/listening/viewing to these recommended materials.	1	2	3	4	5
5. I often discuss the content of the recommended materials with my friends.	1	2	3	4	5
6. I often discuss the content of the recommended materials with my teachers.	1	2	3	4	5
7. I often do other activities with these compulsory materials (Please specify).	Please specify ………				

Perceived outcomes after reading/listening/viewing recommended materials

1. I often remember the content of the recommended materials after I read/listen/view them.	1	2	3	4	5
2. I often understand the content after I read/listen/view recommended materials.	1	2	3	4	5
3. I often apply (use) the content of the recommended materials to do exercises/activities.	1	2	3	4	5
4. I often analyse the content of different sections in the recommended materials.	1	2	3	4	5
5. I often evaluate the content of the tài liệu tham khảo materials.	1	2	3	4	5
6. I often create other knowledge which is similar to the content of recommended materials.	1	2	3	4	5

C. Self-selected materials

1. Do you often search self-selected materials for this subject?
a. Yes
b. No
2. What are the self-selected materials that you find them by yourself to read/listen/ view?
a. Textbooks   b. Handout
c. Lecture notes   d. Workbooks
e. Journal articles   f. Powerpoint slides
g. Lesson plans   j. Videos
h. Others……… (please specify)

Opinion	Strongly Disagree	Disagree	Neutral	Agree	Strongly agree
1. I often read/listen/view these self-selected materials.	1	2	3	4	5
2. I often write reflective journals (take notes/ comments/underline key points) when I read/listen and view these self-selected materials.	1	2	3	4	5
3. I often summarize these self-selected materials.	1	2	3	4	5

4. I often complete activities provided after reading/listening/viewing to these self-selected materials.	1	2	3	4	5
5. I often discuss the content of the self-selected materials with my friends.	1	2	3	4	5
6. I often discuss the content of the self-selected materials with my teachers.	1	2	3	4	5
7. I often do other activities with these compulsory materials (Please specify).	Please specify ………………				

Perceived outcomes after reading/listening/viewing self-selected materials/

1. I often remember the content of the self-selected materials after I read/listen/view them.	1	2	3	4	5
2. I often understand the content after I read/listen/view self-selected materials.	1	2	3	4	5
3. I often apply (use) the content of the self-selected materials to do exercises/activities.	1	2	3	4	5
4. I often analyse the content of different sections in the self-selected materials.	1	2	3	4	5
5. I often evaluate the content of the self-selected materials.	1	2	3	4	5
6. I often create other knowledge which is similar to the content of self-selected materials.	1	2	3	4	5

Part 3. Motivation for reading materials

	Strongly Disagree	Disagree	Neutral	Agree	Strongly agree
1. I often read/listen/view the materials because of the teacher's request.	1	2	3	4	5
2. I often read/listen/view the materials to complete the course's tasks.	1	2	3	4	5
3. I often read/listen/view materials to get higher scores.	1	2	3	4	5
4. I often read/listen/view materials because I love that subject.	1	2	3	4	5
5. I often read the materials because I find them interesting.	1	2	3	4	5

Appendix 2

Interview questions

1. What kinds of materials did teachers send to you? (books, journal articles, videos)? What else? Did the teachers request you to read these types of materials?
2. How did you interact with these types of materials? Did you read/listen/view these kinds of materials?
3. Did you remember, understand, apply to do homework/ analyse these types of materials?
4. What kinds of self-selected materials did you find on the internet?
5. How did you interact with the self-selected materials?
6. What motivates you to read materials?