

A Study of the 21st Century Teaching Competences in Content-Based Instruction Implementation

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ABSTRACT

The present study aimed to describe the implementation of content-based instruction in a microteaching course attended by 28 undergraduate pre-service teachers of the Biology and Mathematics Education study program. The study regards the importance of ensuring the readiness of the 21st-century undergraduate pre-service teachers especially in a class where content-based instruction was implemented. The study, therefore, focuses on the undergraduate pre-service teachers' English proficiency in using the target language for teaching subjects (i.e. biology and mathematics) and their skill in operating technology. The data were gathered using a questionnaire that was distributed online. The study found that 1) most respondents are aware of the importance of mastering English for carrying out learning; 2) despite the positive view, none of the respondents are confident because of their lacking English proficiency. Furthermore, 3) the respondents mostly think that they have problems when writing the materials in English, but 4) it was found that they are ready to use English when delivering the materials in the classroom. 5) Most respondents find grammar difficult to deal with, followed by speaking. In regards to the skill in using technology, the study found that 6) most respondents identify themselves as skilled in using technology, and it is supported by the variety of technologies used for teaching and making media. The implication of this study is for policymakers to strengthen English learning outcomes for those in biology and mathematics study program.

Keywords: content-based instruction, undergraduate pre-service teachers, 21st century competences

INTRODUCTION

Undergraduate pre-service teachers develop their teaching competences from the basic. They learn the subject materials in the field, and also teaching competences. They have proceeded those contents and skills for being competent, both in subject matters and pedagogical aspect. Getting experiences in 21st century learning situation, undergraduate pre-service teacher become motivated to bring themselves to be competent teachers.

21st CENTURY COMPETENCES

Nowadays, teaching in the 21st century may be seen as a demanding job. Teachers need to struggle in keeping up with the technology for themselves and for teaching as well as in integrating the necessary skills for the 21st century learning into their syllabi (Liesa-Orús et

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al., 2020; Lubis, 2018; Nessipbayeva, 2019; Rizkiani, 2021). The 21st century learning expects students to attain four skills, namely Critical Thinking, Communication, Collaboration, and Creativity and Innovation, or the 4C's. In accommodating students with these skills, teachers need to have adequate competences (Chu et al., 2017). Besides, it has been regulated in Indonesia's law that a teacher should have the four fundamental competences, namely professional, pedagogy, social, and personal competences. These competences, if extensively defined, can help teachers cope with 21st century teaching demands. For instance, teachers need to build a supportive learning environment that encourages students to collaborate when learning. It can be achieved by collaborating with other teachers and parents.

In regards with the 21st century learning skills, it is urgent that teachers use technology well. By use means that technology can be adapted to teaching context to accommodate a better learning. It also means that technology use should go beyond using PowerPoint slides projected through the LCD. It should open more opportunities for students to learn at their own pace and develop their own capabilities (Anugerahwati & Nurkamilah, 2017). However, studies have shown limited understanding of teachers' use of technology (Lubis, 2018; Syathroh et al., 2020). Teachers believe that using technology helps them in teaching in a way that it saves more time and energy, like when using the Internet to search more learning materials (text and videos) and when presenting the materials in the classroom.

Indonesia has seriously taken the 21st century learning into account by integrating the demands into the national curriculum. The curriculum has explicitly stated the use of technology to enhance learning in the classroom. Actually, this serious act has legally taken form through a project called international standard school (ISS) in Act of National Education System no 20 of 2003. It has been implemented to several schools at all levels, starting from primary to high school, both public and private schools. One of the rationale behind the implementation of this project is to adapt with the advancement of technology, including preparing human resources and management. It is seen as urgent because technology is advancing rapidly, therefore education will be a strategic measure to improve human resources to adapt with future changes and demands in technology.

ISS project encourages teachers to use English as a medium of instruction. It means that even in math or science class, materials should be delivered in English. An evaluation of the 6-year period of implementation of International Standard School (ISS) project, unfortunately, resulted in less satisfactory results (Henly et al., 2013). To be specific, the project has shown very low percentage of using English as medium of instruction in the classroom (16%). It was further explained that teachers showed limited English proficiency (20% of all class teachers), which was measured using TOEFL score (>450). Despite the limitation of TOEFL score in assessing teacher's English proficiency for teaching, it could give a general view that most teachers (80%) are struggling in delivering the subject materials in English.

In the students' view, the implementation of ISS costs more effort (Henly et al., 2013). Students expected that the good facilities in the school could give more learning opportunities. However, the evaluation reported that they could not achieve understanding when learning is delivered in English. This result could be explained by teacher's inability to provide the right input in the classroom. Students have not been prepared with the list of useful terms and phrases for learning, which resulted in unsuccessful learning. That is why it becomes interesting topic to study about teachers' English ability for providing qualified class instruction which is able to convey students to have successful learning. The topic relates teachers' English communication ability in the implementation of Content-Based Instruction.

CONTENT-BASED INSTRUCTION

The use of English as a medium of instruction is also termed Content-Based Instruction (CBI). Its philosophical spirit is to allow language become meaningful and comprehensible input for learners, which was proposed by Krashen (Adhikary, 2020; Spenader et al., 2020; Vanichvasin, 2019). Learning is focused on using the right language for learners according to their age, preferences, and cognitive level. In this view, teachers can use topics of their subjects to encourage learners use English, for example giving relevant videos with English speaking presenters. In order to allow this become a comprehensible input, teachers should also consider the level of difficulty of the language used and topics discussed. To do this, teachers need to diagnose learners' prior knowledge and entry language level.

In its implementation, CBI in Indonesia tends to be more content-driven. As introduced by Omoto and Nyongesa (2013), in a content-driven CBI non-language subjects are taught in English, as opposed to language-driven. Through the implementation, students are expected to learn both content and the target language at the same time. However, since not all teachers are language teachers, learning and teaching could be a lot harder. It is because teachers need to think of how to explain certain complicated concepts in the language that they have not used fluently.

The present study describes readiness of Indonesian undergraduate pre-service teachers of Biology and Mathematics in regards of the implementation of content-based instruction. Understanding the complexity of teaching in the 21st century learning, it is expected that the study findings will contribute practically and theoretically. For this reason, the question of this study is how is the undergraduate pre-service teachers' English proficiency in teaching subjects (biology and mathematics), and how is their skill in operating technology?

METHOD

This descriptive research aims to describe a phenomenon of undergraduate pre-service teachers of Biology and Mathematics. To maintain the natural characteristic of the subjects being studied, no special treatment or intervention was provided. The study was focused on exploring the implementation of content-based instruction and the 21st century teaching competences of 28 pre-service students who took Microteaching course in 2019/2020 academic year. To answer these problems, the data gathered were related to English competence and the use of technology during the implementation of CBI. These data were collected using questionnaire about how the teachers use English instruction and technology on their micro teaching practices. It was distributed online through Google Form.

The data obtained was analyzed descriptively. To ensure the validity, several techniques suggested by Cresswell and Cresswell (2018) were performed, such as triangulation, perseverance of observation, and peer examination. Triangulation was carried out by researchers by providing a simple questionnaire to lecturers supporting micro teaching courses in Biology and Mathematics education study programs. Furthermore, the researchers formed a discussion with some colleagues to determine the accuracy of the analysis conducted. Perseverance in observations was carried out by making careful, detailed, and continuous observations on the results of the questionnaire. Finally, peer examination was done through discussing the process and results of research with other lecturers. This is done with the intention to get input both in terms of methodology and research context. Peers examination is

done to validating data, so the data obtained truly reflects valid. The overall process of research was conducted from 2020 to 2022.

FINDINGS AND DISCUSSION

The results of this research focus on two sections relating to the main data of research on the application of Content-Based Instruction as criteria in analyzing teaching competences in the 21st century learning. The respondents have manifested in fourteen meetings of micro teaching to practice English in their class interaction. They were also motivated to practice their English in their materials instruction. The awareness motivates them to use English even though they get difficulties. They stated that English language skills were important criteria for 21st century teacher candidates. These data are illustrated in Figure 1.

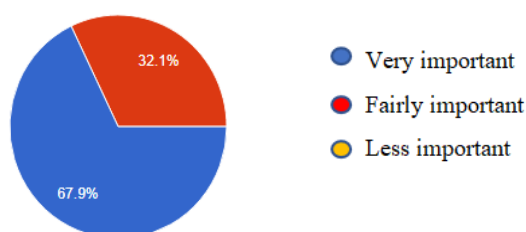


Figure 1. Students' View of the Importance of English

Figure 1 showed how respondents as the prospective 21st century teachers realize and are aware of the importance of mastering English in carrying out learning. They agree that it is very important to master English and able to use English in their classroom teaching. Some sources of teaching materials and open access activities in internet are provided in English. Those make them motivated to use English in their micro teaching practice to help students be familiar and understand English instruction. Less than that, few of them still declare that it is fairly important to master English to teach biology and mathematics. Such positive view towards English use in teaching is a good entry attitude to support the successful 21st century teaching (Bahar & Husain, 2021). This finding confirms a similar study which was taken place in Turkey that pre-service teachers has positive concept of digital literacy and they use various social media platforms for their teaching purposes (Akayoğlu et al., 2020). The pre-service teachers in his research also positively believe that English is very important, as it is a language to make them more global.

The statement was continued with the actual conditions related to English language skills possessed by respondents through proof of English / TOEFL training certificates. For about one semester, some of them take classical short training before joining TOEFL. They could show their moderate English language skills even though un-success to get certificate. Another situation tells different English ability. They still had poor English skills. This data is illustrated in Figure 2.

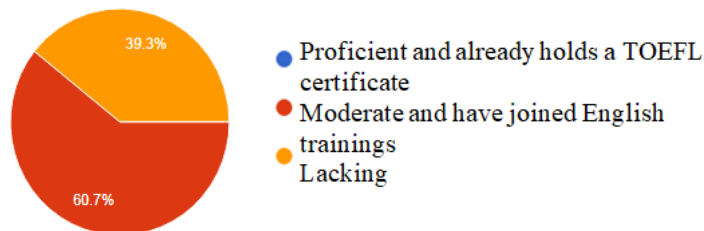


Figure 2. Students' English Mastery

As shown in Figure 2, none of the 28 respondents have stated that they have good English language skills with proof of TOEFL certificates, indicating that none have taken TOEFL test successfully. Over half of the respondents declare their effort to have English training to improve their ability and to get enough experience in English test. It is probably caused by lack of English practices in classroom and beyond. The finding shockingly opposes the previous data in Figure 1. Despite their positive attitude towards English, they are still less proficient to use it in their teaching. It reflects that students still need more training in using the target language.

Furthermore, as set forth in Figure 3, most of the respondents find written expression most difficult when preparing for their teaching materials. The rest, somehow, stated no difficulty in writing teaching materials. It reflects that drilling to write English is also important to give to undergraduate pre-service teacher of biology and mathematics study program to encourage them to provide written English instruction in the teaching-learning process.

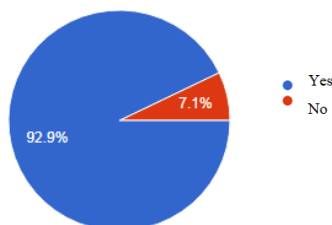


Figure 3. Students' View on the Difficulty of Written Materials

Difficulties in spoken language were also experienced by the respondents. Even students have joined one semester English subject, most of them got less practices in speaking. So, only few of them were brave or ready to use English when delivering learning materials in micro teaching practice. Some of them stated that they did not dare to use English when delivering material in class. While most students investigated were indefinite; they may be brave or not to use English in delivering the subject in the class. The data reflects most students lack self-confidence and get anxiety to practice English in their communication (Jibril et al., 2022). It may correlate with their English proficiency. Still, the data shows quarter of the students confidently stated they are ready to use English in the class. Being confident is an important attribute of a teacher, by which teachers can inspire their students to also use English in their classroom interaction. The finding of readiness in speaking English in delivering subjects is contained in Figure 4.

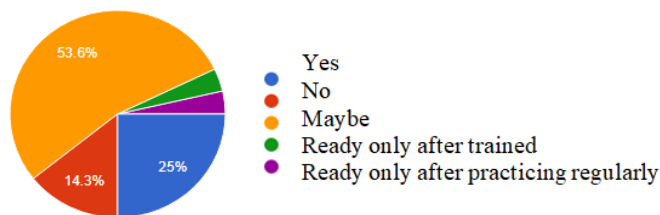


Figure 4. Students' readiness to use spoken English in teaching

To better understand which part of English students find most difficult, the finding as shown in Figure 5 indicates the answer. Most students agree that the most difficult part of English is to produce the language in grammatically accurate sentences, while some of respondents think that vocabulary is the hardest. Difficulties are also experienced by respondents in the practice of the four language skills, but speaking had the most clicks, and followed by listening, writing, and finally reading. Data on English difficulties can be seen in Figure 5 below.

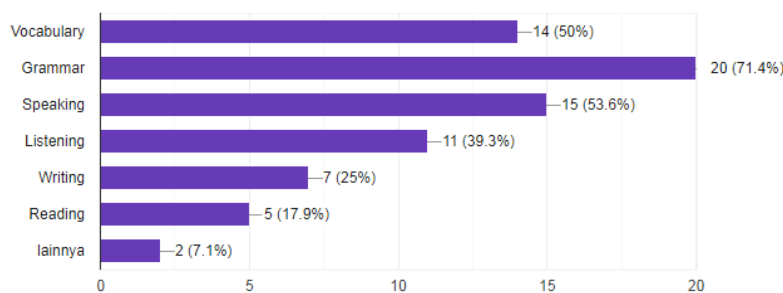


Figure 5. English Difficulties Faced by Students

The data of this study indicate that the ability of English is recognized by students as one of the competences to be mastered by the 21st century teacher candidates where learning must be done openly, ready to be carried out with students with a variety of acceptable language, so that English as an international language can be used the language of communication and interaction in learning any content. In this case, students as prospective teachers are well aware that equipping learners for challenges in the 21st century requires learning that is strengthened by increasing foreign language skills and cultural awareness of students (Essy et al., 2018).

The implementation of Content-Based Instruction provides a more complete atmosphere and opens for more acquisition of learning. In implementing CBI both teachers and students will get not only material content but also English language skills. The acquisition of learning outcomes in CBI directs learners to acquire language skills through content material (Spender et al., 2020). To be specific, the implementation of CBI in learning biology and mathematics provides content learning experiences that are synergistic with language learning experiences at the same time, both teachers and students. This is confirmed that the application of CBI seeks to integrate the learning of other subjects with language learning (Cenoz, 2015; Wang, 2021).

The application of CBI in learning biology and mathematics to provide opportunities and motivation for prospective teachers in the 21st century in creating an interesting and challenging learning atmosphere certainly requires readiness on language skills. The level of readiness to teach by using English in the delivery of material shows that the respondents as

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pre-service teachers are ready to engage functionally as a source of learning for students. The results showed that the students' readiness in English as prospective teachers still had a problem.

The main difficulty in speaking English experienced by respondents in this study was due to their limited vocabulary mastery. Vocabulary is an important key for someone to communicate. When the respondent does not have a vocabulary in a particular expression, there will be obstacles in the communication. Vocabulary becomes a language element that is more important than grammar (grammar) in communication. Without grammar a small thing can still be conveyed, without vocabulary nothing. The problems in vocabulary make students experienced obstacles in delivering learning material. These constraints are experienced both in written and oral languages. Communication difficulties due to lack of vocabulary hinders students in delivering learning materials in both written and oral. This proves that vocabulary is the basis in language skills, both speaking, writing, reading, and listening through acquiring processes in learning (Haberman et al., 2020).

Language difficulties experienced by students as prospective teachers do not become a barrier in realizing 21st century learning. This actually becomes a motivation that makes students keep trying and confident to use English in teaching and learning process. This readiness is a reflection that respondents as prospective teachers are ready to perform the 21st century learning by applying Content-Based Instruction. The use of technology in CBI learning is also an important factor for pre-service teachers in the 21st century. Research data shows that 85.7% of respondents have the skills to use technology for teaching and learning purposes. The percentage of information technology use skills is stated in Figure 6.

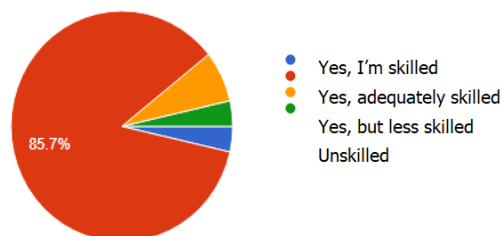


Figure 6. Students' Skill in Operating Technology

This data showed how skillful respondents as undergraduate pre-service teachers in using technology. Although the majority of respondents stated that they were quite skilled, there were even respondents who stated that they were very skilled, but there were still respondents who were less skilled in using IT. These deficiencies in IT skills will certainly affect respondents' readiness in realizing 21st century learning.

Kinds of technology used by respondents in learning practices are varied. The most commonly used learning IT is Power Point Presentation (PPT) and Video PPT. Other technologies used by respondents are presented in Figure 7.

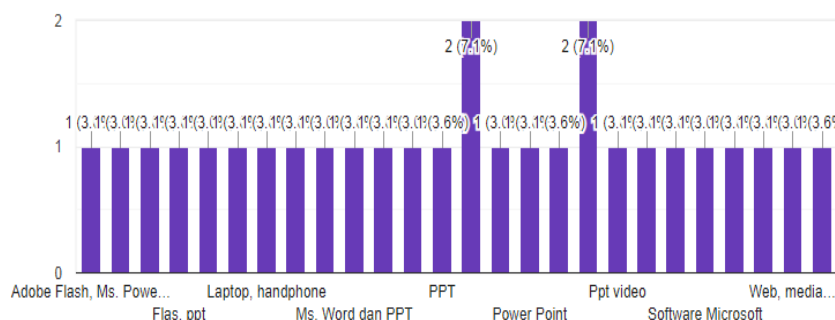


Figure 7. Varieties of Technology Used by Students in Teaching Practice

The data showed the variation of technology used by respondents in teaching and learning practices. This variation shows their creativity in choosing the right technology for their learning media. This can be used as evidence that there is a spirit of creativity in creating the 21st century learning, although it may be limited gathered through some efforts (Instefjord & Munthe, 2016; Reisoğlu & Çebi, 2020). The creativity aspect of pre-service teacher in utilizing digital tool indicates a fulfillment of one of six elements in the 21st century learning (Akayoğlu et al., 2020).

CONCLUSION

Based on the analysis of research results related to English language competence and also the use of information technology in the learning process, it can be concluded that 1) the implementation of Content-Based Instruction in Biology and Mathematics micro teaching class can be carried out with the readiness of prospective teachers; 2) undergraduate students as teacher candidates have relatively adequate technology skills but still lack in English competence. Even though they still face difficulties in speaking English, the undergraduate pre-service teachers still have the eagerness to be ready to use English in the implementation of CBI in the 21st century learning process. With their awareness about the importance of using English in teaching content materials, student teachers can start investing in preparation classes where they can prepare themselves before teaching their students using English. This preparation should include not only spoken skills but also written skills, where they can learn to understand an English-written learning source and explain it in English to their students. The finding will be useful in rearranging the syllabus of microteaching which emphasizes the importance of preparing students' English proficiency for teaching subjects. Additionally, the finding will contribute theoretically to the field of CBI implementation in L2 context, especially when related to the 21st century teaching competences.

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