

The Perception of Teachers and Students on The Development of *Code Learning Model* in Learning English Productive Skills

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ABSTRACT

The present research aims to examine teachers' and students' perception in developing Code Learning Model in learning English productive skills, speaking and writing. The researchers utilized a descriptive study conducted in five universities in Bengkulu. Two hundred and sixteen students were randomly selected from sixth semester students studying in the English department participated in the study. Also, seventeen teachers were included in giving their comments on the questionnaire. The results of this study reveal that according to the perceptions of teachers and students, a coding learning model is essential and can be alternative learning in the era of the industrial revolution 4.0 that puts forward the use of technology. The application of this model can train students' 21st - century competencies and computational thinking because they align with today's developments. It can also motivate students to learn productive English skills to be more exciting and accessible.

Keywords: *Teacher and Student Perception, Code Learning Model, Productive Skills*

ABSTRAK

Menulis merupakan alat yang efektif untuk meningkatkan komunikasi untuk siswa. Dengan menulis, siswa dapat mengeksplorasi segala sesuatu untuk disampaikan kepada orang lain. Oleh karena itu, penelitian ini bertujuan untuk mengetahui pengaruh strategi teater pembaca terhadap peningkatan keterampilan menulis siswa dalam menulis teks recount. Penelitian ini merupakan penelitian pra-eksperimental. Sampel penelitian ini adalah siswa kelas VIII MTs Pidua Meranjat. Data dikumpulkan dengan menggunakan tes tertulis dan dianalisis dengan menggunakan *paired sample t-test*. Temuan menunjukkan bahwa *t*-yang diperoleh (5,228) lebih tinggi dari *t*-tabel (0,692) pada tingkat signifikansi *p*-value di bawah 0,5. Artinya ada peningkatan yang signifikan dalam menulis teks recount setelah diajar menggunakan strategi teater pembaca. Kesimpulannya, teater pembaca mempengaruhi siswa dalam menulis teks recount karena menawarkan cara belajar yang menyenangkan di mana siswa harus menyelesaikan cerita dengan membuat ulang naskah dengan mengkarakterisasi teks yang dipandu oleh strateginya.

Kata kunci: *Persepsi guru dan siswa, Model Mengajar, kemampuan produktif*

INTRODUCTION

In the 4.0 industrial revolution era, there must be a balance between the development of information technology and an effective and efficient learning system. During industrial revolution 4.0, the government employed multiple measures to strengthen the technology-based learning system, such as reorienting the computer programming-based curriculum (coding) to build 21st-century skills and computational reasoning. Coding is a 21st-century skill since it requires the 4Cs of (1) Communication, (2) Collaboration, (3) Critical Thinking and Problem Solving, and (4) Creative and Innovative Thinking (Korb, Hambrusch, Mayfield, Yadav, & Zhou, 2014; Zubaidah, 2016; Henderson, Cortina, Wing, 2007). The government has also begun to push classroom coding education. It aspires to make Indonesia a country that can keep up with global education trends during the 4.0 industrial revolution.

The integration of coding teaching into the learning process is viable. Students in affluent nations have been obliged to learn to code as part of their regular school curriculum until recently (Haseski, Ilic, & Tugtekin, 2018). In Indonesia, coding education is just beginning to expand, primarily due to the Ministry of Religion's incorporation of coding instruction into extracurricular activities and the creation of online coding schools. Sadly, learning to code as the key to success in the 4.0 industrial revolution has not been adequately introduced into education. Instead of learning coding to obtain 21st-century skills and computational thinking, coding is now believed to be the exclusive domain of computer professionals. The students find coding challenging because it requires integrating numerous problem-solving skills (Maryono, 2016).

According to this viewpoint, these concerns must be addressed by the education sector. Coding instruction must be incorporated into the curriculum, especially at colleges that produce future teachers. It serves as a reminder that student-teacher candidates must act as change agents to face the challenges of the education world in the era of the 4.0 industrial revolution. To be competitive in the global labor market, prospective teachers must possess 21st-century abilities. The majority of educators have not yet implemented coding-based learning paradigms. The teachers sometimes only use digital media such as zoom, google classroom, canva, and quiz while employing technology. Inadvertently, children do not develop their computational reasoning abilities while learning. In reality, students must possess this talent to develop their digital skills. The researchers, therefore, attempted to find out teachers' and students' perception on coding learning model which might facilitate the integration of coding with learning, particularly in writing and speaking classes. This concept was regarded as applicable and necessary to satisfy students' future life skills and to develop students' productive skills. Additionally, the students can use various virtual world characteristics to practice their writing and speaking skills.

Initial data indicate that no universities in the province of Bengkulu use the coding paradigm to teach productive English skills. The learning methodology is primarily verbal, resulting in a tiresome learning environment. In addition, learning in higher education is more independent; therefore, it will be suboptimal and difficult if enough capital is not provided. To overcome these challenges, it is necessary to analyze the perception of teachers and students in developing coding learning model. The researchers assumed that

this model, later, will be highly applicable since humans have separate working memory systems for verbal and visual information and a limited capacity to manage information that can be encoded, stored, or retrieved (Paivio, 2006; Solso, 2008; Mayer, 2009). The students will be guided toward higher-order thinking through the coding learning approach by connecting events to facilitate the arrangement of words.

As a form of innovation to enhance 21st-century abilities in the era of industrial revolution 4.0, it is required to conduct a study in analyzing teachers and students' perception to determine the importance of the coding learning model in teaching writing and speaking as productive skills to university students in Bengkulu Province.

One of the themes emphasized by the Indonesian government is learning to code, especially as we face the era of the 4.0 revolution. Internet and digital technologies are the primary drivers of globalization's current progress. The younger generation must learn the technology to avoid slipping behind other nations. As one of the essential 21st-century skills, coding is a digital technology innovation that may be incorporated into the classroom learning process.

This article refers to Paivio's (1990) dual-coding theory in building a coding learning model. According to Paivio, humans have two cognitive subsystems: verbal and visual. Words and sentences are typically processed by the verbal system (unless factual information), whereas pictures can be processed by either the verbal or imaging system. Due to dual coding in memory, the involvement of pictures in the text can enhance brain memory. Several earlier types of research have demonstrated that acquiring knowledge with text and pictures accompanied by animation can improve student learning outcomes compared to when information is presented only orally. Moreover, this theory defines three types of information processing: (a) direct activation of verbal or graphical representations, (b) activation of verbal representations by pictorial or vice versa; and (c) simultaneous activation of verbal and pictorial representations (Barron, 2014; Pajriah & Budiman, 2017; Putri et al., 2021). Dual coding theory suggests that the use of various media in the form of multimedia can facilitate the development of memory and comprehension skills in students (Pajriah & Budiman, 2017; Putri et al., 2021).

As discussed previously, the theory will link the coding system with oral and written productive skills inside the learning paradigm. Usually, productive language skills are taught by auditory media (radio and tape recorders), visual media (pictures, text, flashcards, posters, etc.), or a combination of the two (video and film). Similar opinion with Melati (2017) There was an interaction effect between the use of Group Investigation Model to the reading materials from the multimedia and learning styles on speaking competence. Speaking is productive skill. However, productive language skills have never before been taught via audio media (radio and tape recorders). The concept uses simple computer languages, such as coding, to foster critical thinking in students. If future teachers can create coding-based learning media, the resulting content will be more authentic, inventive, and engaging. Before entering the workforce, it is advantageous for youngsters to develop these valuable skills in school. In a disruptive period, the presence of flexible, dynamic, and creative instructors is vital to the success of the educational process. Aspiring teachers are urged to incorporate coding education in the classroom to be proficient in speaking and writing in Indonesian and foreign language classrooms.

METHODOLOGY

In this study, the researchers used descriptive research to gather data from five institutions in Bengkulu (UIN Fatmawati Sukarno Bengkulu, University of Bengkulu, Hazairin university, University of Muhammadiyah Bengkulu, and IAIN Curup) with two hundred and thirty-three participants, consisting of two hundred and sixteen students and seventeen teachers. The sample was chosen randomly. A proper and reliable research tool, a Google form questionnaire, was created and approved by the expert for use in the study. The questionnaire asks about the demands of the teachers' and students' desires in using coding learning models for teaching speaking and writing skills in English classrooms. In creating the questionnaire, the researchers consider several aspects, such as learning models, coding learning models, learning language skills which include writing and speaking, and the needs of the world of work.

The aspects of the questionnaire included coding learning model, productive skills, and the relevance and anticipation of the world work needs. Each aspect consists of some components which cover about how importance coding learning media integrated in the productive skill courses and how urgency it is in relation to the demands of the current world work needs. After the questionnaire has been made, it was tried it out with the students who have the same level as the samples in this study. After obtaining all the data, the results of the analysis were displayed in the form of a percentage and described in the form of a scientific narrative.

FINDINGS AND DISCUSSIONS

Findings

Teachers' and Students' Perception on the Development of Coding Learning Models

This section outlines, from the perspectives of students and teachers, the necessity to design a coding learning paradigm for productive language skills courses at the Faculty of Education. The presentation and analysis are below.

The Perspective of the Students

The requirement for students to construct learning models is a process of recognizing difficulties by examining the disparity between the actual situation and what they desire. In addition, the defined objectives and competencies are explained in a systematic manner. In this study, 216 student needs analysis questionnaires were sent at random to five institutions in Bengkulu Province, specifically to students enrolled in the Faculty of Education.

The following facts emerged from an investigation of the requirement for coding instruction in courses on productive language skills, especially speaking and writing. Based on the result on the Table 1 below, it can be seen that most of the students answered in strongly agree and agree with the statements provided by the researcher. They agreed on the importance of digital competence which is needed in this current era.

Table 1. The Result of Students Answering the Questionnaire based on Coding Learning Model

No.	Statements	Strongly agree	Agree	Disagree	Strongly Disagree
1.	The use of information technology in the industrial revolution 4.0 is very much needed in 21st century education	75%	25%	0%	0%
2.	In my opinion, coding learning really needs to be implemented, namely by integrating the use of technology and learning in education through certain applications or software	41%	66%	3%	0%
3.	Increasing digital competence and the use of coding in learning is very important for students in line with the demands of the growing era	67%	33%	0%	0%
4.	I hope that universities can facilitate the strengthening of students' digital competencies through learning to code	65%	35%	0%	0%
5.	Teachers and institutions are urgently needed in efforts to increase digital competence through learning coding for students	67%	33%	0%	0%
6.	Coding technology can be applied in learning in universities through integration in lectures	43%	57%	0%	0%
7.	The new direction of learning and education in the 21st century is to have technological skills in learning	57%	43%	0%	0%
8.	Learning and education that must be improved in the 21st century is computational thinking skills	21%	79%	0%	0%
9.	Education should not isolate students from technological developments	42%	58%	0%	0%
10.	Education must take advantage of technological developments	55%	45%	0%	0%
11.	Education and learning in universities must teach students to be data and information literate	64%	36%	0%	0%
12.	I was taught by teachers about the introduction of using software in learning such as coding	0%	5%	72%	13%

Table 2. The Result of Students Answering the Questionnaire based on the productive skills

No.	Statements	Strongly agree	Agree	Disagree	Strongly Disagree
1.	Writing skills are very important to be taught in college	76%	24%	0%	0%
2.	In college, good language and speech attitudes are taught both at the local and	53%	47%	0%	0%

global level					
3.	In speaking skills are college, very important	44%	66%	0%	0%
4.	In college, writing skills are very important	49%	51%	0%	0%
5.	Learning productive language skills must continue to be developed both in terms of orientation and paradigm	30%	70%	0%	0%
6.	The quality of learning productive language skills must continue to be improved	62%	38%	0%	0%
7.	The new paradigm in learning is that students are able to explore and criticize various texts through learning productive language skills	30%	70%	0%	0%
8.	The new standard in learning productive language skills is that students can speak and write various types of texts that have been studied in study programs at the faculty of education	52%	46%	2%	00%
9.	Learning speaking skills is believed to make the speakers have deep understanding, critical thinking skills, creative thinking skills, computational thinking as well as the ability to collaborate and communicate in accordance with the demands of the 21st century in the 4.0 revolution era.	55%	45%	0%	0%
10.	Learning writing skills is believed to make writers have deep understanding, critical thinking skills, creative thinking skills, computational understanding, as well as the ability to collaborate and communicate in accordance with the demands of the 21st century in the 4.0 revolution era.	42%	58%	0%	0%
11.	Learning speaking skills is an important skill that must be taught in college	36%	64%	0%	0%
12.	Learning writing skills is an important skill that must be taught in college	40%	60%	0%	0%
13.	Learning speaking skills is believed to be a medium of expression and a medium for building meaning for writers	30%	70%	0%	0%

From table 2, it can be seen that the students have understood that speaking and writing skills as parts of the language skills that should be mastered. Since it is included in the productive skills, the students need to have better method in learning these skills.

Table 3. The Result of Students Answering the Questionnaire based on the Relevance and Anticipation of the world work needs

No.	Statements	Strongly agree	Agree	Disagree	Strongly Disagree
1.	Universities need technology-based learning models to support 21st century education	72%	28%	0%	0%

2.	The use of appropriate methods and strategies in learning can increase learning success	68%	32%	0%	0%
3.	The 21st century really needs learning based on computational understanding such as coding	41%	59%	0%	0%
4.	The use of scratch applications in learning coding is needed by students in the 21st century	43%	54%	3%	0%

Based on the findings from the needs analysis data above (Table 1, 2 and 3), it is proven that the coding learning model for teaching English productive skills still needs to be developed. This is what strengthens the reason for the researchers to conduct this study later on.

The Perspective of the Teachers

Based on the teacher's point of view, a questionnaire to analyze the need for coding learning model development consisting of a number of statements to be responded to by the teacher related to the coding learning development model for English productive skills.

In this study, the needs analysis questionnaire from the teacher's point of view was distributed to 5 universities in Bengkulu Province. The results obtained were 17 teachers from the faculty of education or tarbiyah who filled out the questionnaire. From the results of the questionnaire analysis of the needs for the development of coding learning in productive language skills courses from the teacher's point of view, the following facts were found.

Table 4. The Result of Teachers Answering the Questionnaire based on Coding Learning Model

No.	Statements	Strongly agree	Agree	Disagree	Strongly Disagree
1.	The use of information technology in the industrial revolution 4.0 is very much needed in 21st century education	88%	12%	0%	0%
2.	In my opinion, coding learning really needs to be implemented, namely by integrating the use of technology and learning in education through certain applications or software	74%	26%	0%	0%
3.	Increasing digital competence and the use of coding in learning is very important for students in line with the demands of the growing era	87%	13%	0%	0%
4.	I hope that universities can facilitate the strengthening of students' digital competencies through learning to code	77%	23%	0%	0%
5.	Teachers and institutions are urgently needed in efforts to increase digital competence through learning coding for students	85%	15%	0%	0%
6.	Coding technology can be applied in learning in universities through integration in lectures	69%	31%	0%	0%
7.	The new direction of learning and education in the 21st century is to have technological	76%	24%	0%	0%

skills in learning					
8.	Learning and education that must be improved in the 21st century is computational thinking skills	70%	30%	0%	0%
9.	Education should not isolate students from technological developments	92%	8%	0%	0%
10.	Education must take advantage of technological developments	95%	5%	0%	0%
11.	Education and learning in universities must teach students to be data and information literate	92%	8t%	0%	0%
12.	I teach my students the introduction of using software in learning such as coding	2%	10%	88%	0%

Based on the result in table 4, it can be seen that almost all the teachers chose strongly agree on each aspect of the questionnaire. It shows that they agree on the importance of integrating digital technology in productive skill courses. Yet, some of them were not frequently using software in the classroom in teaching the students.

Table 5. The Result of Teachers Answering the Questionnaire based on Productive Skill

No.	Statements	Strongly agree	Agree	Disagree	Strongly Disagree
1.	Writing skills are very important to be taught in college	95%	5%	0%	0%
2.	In college, good language and speech attitudes are taught both at the local and global level	73%	27%	0%	0%
3.	In college, speaking skills are very important	80%	20%	0%	0%
4.	In college, writing skills are very important	82%	18%	0%	0%
5.	Learning productive language skills must continue to be developed both in terms of orientation and paradigm	72%	28%	0%	0%
6.	The quality of learning productive language skills must continue to be improved	90%	10%	0%	0%
7.	The characteristics of learning productive language skills must be based on coding to suit the needs of the world of work and skills that must be mastered in the 21st century in the era of the industrial revolution 4.0	70%	30%	0%	0%
8.	The new paradigm in learning is that students are able to explore and criticize various texts through learning productive language skills	87%	13%	0%	0%
9.	The new standard in learning productive language skills is that students can speak and write various types of texts that have been studied in study programs at the faculty of education	51%	49%	0%	0%
10.	Learning productive language skills is believed to make the speakers have deep understanding, critical thinking skills, creative thinking skills, computational thinking as well as the ability to collaborate and communicate in accordance	68%	32%	0%	0%

	with the demands of the 21st century in the 4.0 revolution era.				
11.	Learning productive language skills is believed to make the speakers have deep understanding, critical thinking skills, creative thinking skills, computational understanding, as well as the ability to collaborate and communicate in accordance with the demands of the 21st century in the 4.0 revolution era.	60%	40%	0%	0%
12.	Learning speaking skills is an important skill that must be taught in college	94%	6%	0%	0%
13.	Learning writing skills is an important skill that must be taught in college	90%	10%	0%	0%
14.	Learning speaking skills is believed to be a medium of expression and a medium for building meaning for writers	83%	17%	0%	0%

Based on table 5, it can be seen that the teachers have high awareness that speaking and writing skills as parts of the language skills that should be mastered by their students. Therefore, choosing the best method integrated with technology might be one of the solving problems to make it more successful.

Table 6. The Result of Teachers Answering the Questionnaire based on Relevance and Anticipation of the world work needs

No.	Statements	Strongly agree	Agree	Disagree	Strongly Disagree
1.	Universities need technology-based learning models to support 21st century education	86%	14%	0%	0%
2.	The use of appropriate methods and strategies in learning can increase learning success	90%	10%	0%	0%
3.	The 21st century really needs learning based on computational understanding such as coding	72%	28%	0%	0%
4.	The use of stretch applications in learning coding is needed by students in the 21st century	67%	32%	1%	0%

In table 6, it can be seen that most teachers strongly agree on the needs of teaching computational thinking in the classroom. The use of technology-based learning, like coding is also good way for the students to face the world work face in the future.

From the needs analysis questionnaire survey taken from the point of view of the teachers above, it also proves that the coding learning model on productive language skills also needs to be developed.

Discussion

To succeed in their academic endeavors, students in higher education institutions need to possess digital literacy and 21st-century abilities. Hixson et al. (2012) explain that every student in the twenty-first century should have eight talents. First, "critical thinking abilities" refers to a student's capacity to analyze complex circumstances, investigate subjects that defy

simple explanations, evaluate various points of view from information sources, and draw suitable conclusions based on evidence and logic. Second, students' abilities to collaborate to solve problems or provide answers, work effectively and courteously in groups to achieve a common objective, and share responsibility for assignment completion are all examples of collaboration skills. Third, communication skills refer to a student's capacity to arrange their ideas, information, and discoveries and successfully express those ideas using various media, including both oral and written communication. Fourth, creativity and innovation skills refer to students' capacity to use synthesis and analysis to find and improve solutions to challenging problems or tasks and combine or convey what they have learned in novel and creative ways. Fifth, self-direction abilities refer to students' capacity to take charge of their learning by selecting research topics and learning strategies, as well as by reviewing their work and responding to feedback. Sixth, "global links" means students' understanding of geopolitical and global themes such as geography, culture, language, history, and literature from various countries. Seventh, local connections refer to students' capacity to integrate what they have learned into local situations and issues facing the community. The final need is that students should be able to manage and create outputs utilizing appropriate information and communication technologies.

One of the aspects above is the ability to master digital technology. The digital world is unavoidable. All aspects of life utilize digital technology as part of the needs that must be fulfilled. It is the basis that humans in this day and age must be literate with technological developments. Various technological equipment, both information, and communication technology have become part of life that must be mastered. In line with this, education today must integrate the development of digital technology with learning components, such as the application of learning to code.

Teachers and students must be literate in using digital technology to create interactive, collaborative, creative, innovative, and effective learning. In addition, digital-based learning also attracts the attention of students based on a high sense of curiosity, so it must be fun. Getting used to being close to digital technology is very good for equipping students to face the world of work needed to be proficient and skilled at mastering existing technology. They also can made a lesson video or gave a link of an explanational material video and invited the students to give them feedback on the lesson. (Suryani, D., Yunita, W., & Harahap, A, 2021).

Based on the researchers' analysis of teachers' and students' perceptions of the development of coding learning models, it was found that this model can be one way for teachers to integrate technology into the learning process through simple coding techniques. This model can later be applied to students with the aim that students can hone their English skills with the features or tools available. In addition, this model will be beneficial to train and hone students' creativity in thinking because coding can train their logic, logic, and thinking concepts, especially in solving problems systematically (computational thinking). With the development of teaching materials and videos about coding, students can learn to make teaching media in the form of games, animations, or stories, as well as familiarize themselves with technology in this digital era.

CONCLUSION AND SUGGESTION

Based on the analysis of the students' and teachers' perceptions, it can be seen that the coding learning model really needs to be developed so that it can be implemented in the teaching of English productive skills by building a synergy between the needs of the world of work and technology-based learning systems.

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