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Students' Empathy Attitude in Helping To Overcome Difficulties in Mobile Device Programming Learning

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Abstract:

Learning is a process of making people or living creatures learn. Learning is very important for students in an era of increasingly rapid technology, one of which is learning to program mobile devices. Of course, in learning there must be achievements learning that must be achieved by students. To achieve learning, students must overcome challenges with different levels of difficulty. This level of difficulty can influence the emotional development of students, especially in providing a sense of empathy towards other students. This research raises the problem of the level of difficulty faced by students in the process of learning mobile device programming and how to empathize in helping students overcome these difficulties. This research method uses a qualitative method with a descriptive approach where the researcher describes the literature review and describes the answers to existing problems. By collecting data through interviews, observations and literature studies. This research was carried out at one of the 11th grade Surakarta State Vocational Schools in phase F on the achievements per mobile device programming element. Based on the results of research in learning mobile device programming, educators know the importance of understanding students' level of difficulty using theory *Bloom's Taxonomy* and students' empathetic attitude towards the difficulties they face based on Erik Erikson's theory. So that an empathetic attitude can influence students' success in achieving learning.

Keywords: *Bloom's Taxonomy, Emotional Development, Erikson's Theory Of Psychosocial, Learning*

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Introduction

According to the Big Indonesian Dictionary, learning is a process, method, act of making people or living creatures learn. According to cognitive theory quoted from (Pahru et al., 2023) the meaning of learning or studying is an effort that focuses on the process of forming memories, storing information, processing information and emotions related to things that are intellectually building. From the process In learning, students gain knowledge, master skills, develop positive habits, and form attitudes and beliefs. Thus, learning is a way to support students so they can learn effectively. Educators must of course pay attention to the characteristics of students to implement learning in accordance with current developments. Learning is very important in an era of technology that is increasingly developing rapidly. Technology has a role in education in the 4.0 era with the use of technology (Salma et al., 2021).This research focuses on learning mobile device programming in Vocational High Schools which has become the main focus in line with the rapid development technology in everyday life. Vocational High Schools are a place to train critical thinking skills through teachers during this period of the learning process (Septiana et al., 2022). Learning basic programming concepts related to mobile applications has become an integral part of the educational curriculum, requiring students to understand and master the relevant technical skills listed in the Head of BSKAP's decision letter number

33/H/KR/22. Learning device programming moving is a challenge for students to understand the process of technological development, especially in programming-based *mobile* or *android*. Apart from that, it provides a challenge for a teacher to guide and educate students in the learning process of creating applications using various programming languages*android*. This challenge is dealing with program code that is experiencing problems, for example incorrect program code, problems with the software, lack of understanding of the Android programming language and so on. For students who often experience difficulties, frustration arises or gives an emotional response to stress. Therefore, educators need to carry out evaluations in learning which aim to measure students' abilities. According to the National Education Department in 2008, quoted from (Cressa & Mukhlis, 2023), the success of educators in mastering classroom situations depends on the role of educators, because in evaluation there is a process for measuring and assessing an activity or program implemented to achieve the target results. Instruments for measuring and assessing can use Bloom's taxonomy theory to measure students' level of understanding. Learning achievement is based on learning outcomes that have been determined by the government.Learning outcomes are learning competencies that students must achieve at each phase of development. Learning Outcomes for primary and secondary education consist of 6 phases, namely phase A to phase F, which covers all subjects at the primary and secondary education levels (SD/MI, SMP/MTs, SMA/MA, SMK/MAK, SDLB, SMPLB , SMALB, Package A, Package B, and Package C). Each learning achievement in a subject has several elements or groups of essential competencies that apply equally to all phases of the subject. This research applies to phase F majoring in software and game development with achievements per element, namely mobile device programming. Researchers are interested in analyzing the cognitive level of learning outcomes per mobile device programming element. Based on the cognitive level of Bloom's taxonomy according to (Ministry of Education and Culture, 2019) it is classified into 3 cognitive levels, namely level 1 shows a low level of ability (knowledge and understanding) with the cognitive categories of remembering (C1) and understanding (C2), level 2 shows a higher level of ability (application) with the cognitive category of applying (C3), and level 3 shows a high level of ability (reasoning) with the cognitive categories of analyzing (C4), evaluating (C5), and creating (C6). So as to measure the level of difficulty of learning achievement.

Difficulties faced by students can influence students' emotional development. Emotional development according to Suyadi is an outpouring of feelings when children interact with other people (Mulyani, 2013). This research focuses on the development of students in schools, one example of which is Vocational High Schools in Surakarta. Based on observations in class 11 of software and game development, one of the state vocational schools in Surakarta, when learning mobile device programming related to emotional development, there were several student responses, namely giving less empathetic responses to their friends when doing project-based learning and giving happy, lazy, facial expressions. confused, angry, etc. In order to see in more detail the emotional development of vocational school students in the context of mobile device programming learning, it is important to analyze the emotional changes that occur in students throughout the learning process. This includes emotional reactions that may arise, such as the level of self-confidence, motivation, stress, frustration and enthusiasm for the material. So this article aims to analyze the emotional development of vocational school students in Surakarta in learning mobile device programming. That emotion is a functional state of neural activity. Emotional development is carried out by nervous activity that controls body movements so that students can respond in the form of movement(Adolphs, 2017). According to Ekawati in the Indonesian Teacher Research journal, education is directed at creating new behaviors in students through stimulus responses given during the learning process (Habsy et al., 2023). As stated by Erik Erikson in the book "*Childhood and Society"* In 1963, Erikson created a chart to sort eight separate stages of ego development in psychosocial terms, which is commonly known as the "eight stages of human development". Several previous studies have focused on the stages of human development starting from children, adults and the elderly. This study has highlighted ego development in psychosocial terms based on Erik Erikson's theory. This research uses research reference sources related to psychosocial development based on Erik Erikson's theory to be used as a comparison of problems in psychosocial development in Vocational High School students. Many studies show various views on Erik Erikson's theory to determine the stages of psychosocial development in a person. Several research results from the last 5 years that are relevant to this research will be presented as reference material.

The first is based on research conducted by Sendi Wijaya, with the title "The Role of Parent Teacher Associations in School Age Children's Psychosocial Development", in 2022. This research discusses the problem of psychosocial development in children, especially school age children, which receive little attention. In fact, in children's psychosocial development, they play an important role in finding their identity in the future. The method used by the literature is to collect information from related sources, whether from books, research journals or previous research. From these problems, the results show that parents need to provide appropriate parenting patterns to their children, especially during the school age period. where they need support, motivation and stimulus from parents through routine and intense communication and the teacher's ability to understand the psychosocial development of school-age children and facilitate children to find their identity is very important (Wijaya, 2022).

Second, based on research conducted by Maria Deptula entitled "The Possibility of a Teacher Reducing the Feeling of Helplessness in Learning Polish Language and Mathematics in the Fifth Year of Elementary School", in 2021. This research discusses the level of school helplessness in the conditions of psychosocial development created for students in their fifth year in elementary school. The method used is a quantitative strategy. From these problems, the results show that teachers have the strongest impact on the level of helplessness, followed by schools values, and peer relationships based on Erikson's theory, and provide success in the next stage of life but also motivation to learn, creativity, flexibility of thinking and acting, perseverance, and the emotions that accompany students when learning depend on a sense of competence. Teacher care and attention is given to ensure that each student can develop their competence and sense of agency in accordance with the potential of students, teachers and society (Deptuła & Borsich, 2021).

Third, based on research conducted by Marianne Rorije entitled "Applying Erikson's Psychosocial Development Theory to Understand the Development of Autonomy in Children and Adolescents with Deafblindness", in 2023. This research discusses the problem of how children and adolescents with congenital blindness -deaf shows the characteristics of autonomy and the way caregivers carry out autonomy support, which Erikson described as part of the first three stages of psychosocial development. From these problems, the results show that the research shows the characteristics of Erikson's first stage of psychosocial development, with caregivers tending to fulfill the tasks of autonomy in that stage. These children also show independent action in the second stage, although limited to concrete situations. However, their difficulty in developing symbolic communication affects the autonomous characteristics of the second and third stages. Caregivers are advised to provide support appropriate to this developmental stage, for example, providing protection while encouraging initiative and purpose. The use of longitudinal video interventions to assist communication skills and support caregivers in creating a balance between physical presence and fostering the autonomous characteristics of children and adolescents with deafblindness is recommended (Rorije et al., 2023).

However, there is little research that investigates how Vocational High School students develop in learning programming and understanding students' behavior in implementing programming learning. This analysis is important to fill existing knowledge gaps and enable teachers to know students' development. Although many studies have highlighted psychosocial development according to Erikson's theory in knowing the emotional, motivational and individual development of students. However, there is a gap in understanding the psychosocial development of Vocational High School students or teenagers. Existing research tends to focus more on psychosocial development in learning motivation, parenting patterns, and the role of teachers in psychosocial development. Attitudes can influence students' creativity, such as the attitude of daring to try something new and not copying other people's work will greatly determine creativity. Because with an attitude of self-confidence, students can give rise to creativity with various new ideas (Nabih et al., 2022).So there is a need for research on psychosocial development which concerns the relationship with the human ego or personality, changes in each life, and understanding problems, behavioral patterns, emotions and other psychological aspects that may influence a person. Based on the literature review and identified gaps, there are several problem formulations, namely the level of difficulty faced by students in learning mobile device programming and how to empathize in helping students resolve these difficulties.

Research Method

This research was conducted at a vocational high school in Surakarta. The research method that researchers use is qualitative with a descriptive approach. According to Denzin and Lincoln, qualitative research is research that uses a natural background, with the aim of interpreting phenomena that occur and is carried out by involving various methods that exist in qualitative research. This method is usually used, namely interviews, observations and use of documents (Suliswiyadi, 2019). On This research uses a qualitative descriptive approach which aims to describe the results of a literature review regarding psychosocial development in high school students during programming learning. The description method is research used to describe and answer the problems of the current study. This descriptive research explains it in a structured, accurate manner and in accordance with existing reality (Ardillani & Wulandari, 2022). The form of data collection uses interviews, observation and documentation. The participants in this research were 11th grade students at Vocational High Schools majoring in software and game development as well as teachers of software development subjects at one of the Surakarta State Vocational Schools. The number of participants was one class, namely 11 software and game development B with 35 students and 1 subject teacher.

Result and Discussion

The results and discussion section will provide an explanation of the research result and discussions carried out by researchers when conducting field experience practice 1 at one of the Surakarta State Vocational Schools. The explanation provided is an explanation of the existing problem formulation.

Result

This research is research that focuses on teachers and students in schools. As a data study, researchers carried out data search activities through observations and interviews with students and teachers. Observations were carried out during field experience practice 1 and produced several data that could be used for data processing. Based on the results of research at one of the State Vocational Schools in Surakarta, it was found that in learning mobile device programming or*mobile* Students in class 11 software and game development B had difficulty working on a project given by the teacher. Where this assignment aims to train students in understanding Android program code. The task given by the teacher is to create a simple application where there is a CRUD fu nction (creat, read,update, delete) with the command asking students to follow the program code that has been provided, then when the program is running successfully or the program display results appear, students can continue or add displays according to the students' creativity. The teacher gives assignments to students according to the level, where at the first level, students follow the program code provided in the teaching module, second, students can change the color appearance of the application they are creating, and at level three, students can add menus that can function accordingly. with creativity from students. From these activities, it may be that not all students can complete the project. Based on the level of project work in one meeting for 7 class hours. Because it requires carefulness in writing program code and repairing it when the program code still exists error. At the end of the learning session the teacher reflects on the learning. The aim is to evaluate learning. Reflection carried out by the teacher is by giving direct questions verbally about the difficulties experienced by the students. After conducting an evaluation of the students, the researchers obtained the results of the difficulties that the students often experienced. The following are the types of difficulties.

Table 1. Types of difficulties experienced by students

No	A natural kind of difficulty	Findings
1.	Difficulty opening android software	1 person
2.	Difficulty in understanding greadle to run the program but the emulator does not appear.	10 people
4.	Difficulty in understanding program code that still contains writing errors.	15 people
5.	Difficulty in implementing database logic functions in application creation	5 people

From these types of difficulties, we know the difficulties experienced by students in learning mobile device programming. This is proven by the results of student projects where the application output results. That is the data obtained from students during face-to-face learning. Next, data collection was based on the results of interviews with resource teachers in mobile device programming subjects. The media used for interviews is recording sound via audio WhatsApp. When conducting interviews, researchers asked questions related to the students' development during each day's learning. In this case, researchers link learning to student behavior, especially emotional development. The researcher asked a question related to students' emotional attitudes in facing mobile programming learning. Below are the results of an interview with the resource person, one of the mobile device programming subject teachers.

Table 2.Interview results

Date Interview	Discussion material	Interview result
31 October 2023	Development Emotions	Most software and game development students sometimes do not empathize with their fellow students, such as when there are guest teachers who are good at coding and continue to code until the module is almost finished, while those who are less smart are confused to the point that sometimes some of them

		cry, so the teacher's job, apart from teaching, is also to guide. So you need to remind them to always be empathetic, friends who don't understand can be taught or guided.

From the interview data, it is clear that in learning mobile device programming, when students receive assignments from subject teachers or guest teachers, they have poor social attitudes, namely a lack of empathy with their classmates. For example, when students who understand the material always follow their own desires to be superior, but in social life they still lack empathy for classmates who have difficulty coding. The various data that have been found are direct findings that occurred in the field of one of the State Vocational Schools in Surakarta. The difficulties in learning faced by students and the emotional development of students in learning can be linked to Erikson's theory of psychosocial development of students in learning.

Discussion

The form of discussion that will be given in this research is about the difficulties faced by studentsmin learning mobile device programming and how to have an empathetic attitude in helping students in resolving these difficulties. An in-depth explanation is given from the data that was obtained during field experience practice 1. The following is an explanation that answers the problem formulation.

Difficulties faced by students in learning mobile device programming

According to the KBBI, difficulty means a difficult situation. Difficulties experienced by students are difficult situations in working on and completing learning outcomes during school. In this research, the target is students in class 11. To understand the level of difficulty of students' understanding, Bloom's taxonomy theory can be applied. Blooms taxonomy is a classification system that comes from Greek and contains two meanings, namely "*Taxis/*settings" and "*Nomos /*Science". This theory comes from the thoughts of an educational psychologist, namely Dr. Benjamin Bloom, who formed higher level educational thinking, namely analyzing and evaluating concepts, processes, procedures and principles, not just remembering facts or memorizing. Bloom's taxonomy theory is widely applied when planning learning and learning objectives and various learning activities. Bloom's taxonomy theory formulates 3 learning domains, namely the first cognitive domain which includes mental skills (knowledge), the second affective domain which includes the growth of feelings or emotional areas (attitudes) and the third psychomotor domain which includes manual or physical skills. Bloom's taxonomy is related to memory, thinking and processes. -reasoning process. The following is Bloom's taxonomy of cognitive domains:

Table 3.Taxonomy Bloom

	Taxonomy Bloom	Level
C1	Remember	Low Order Thinking
C2	Understand	
C3	Apply	
C4	Analyze	High Order Thinking
C5	Evaluate	
C6	Create	

Based on Bloom's taxonomy theory, it can measure students' difficulties in learning mobile device programming. The learning outcomes as guidelines in class 11 have been determined in the Head of BSKAP's decision letter number 33/H/KR/22, namely that students are able to understand and communicate the meaning, history and components of mobile device operating systems and application development, understand concepts and apply Integrated Development Environment, framework and programming language for developing mobile device applications, understanding concepts and applying mobile device databases, programming language for developing

mobile device applications for various contextual needs, application interfaces that are interconnected with other applications (Application Programming Interface). Apart from that, students are also able to document and present the mobile device applications that have been developed. After knowing the learning outcomes, the next step is to create learning objectives. From achievements The learning is to understand the material starting from a low level, namely understanding (C2), then applying (C3), and documenting including (C4) (Nafiati, 2021). This is proven by students' responses ranging from difficulties in understanding greadle, and difficulties in applying logic*database* .

An empathetic attitude in helping students solve these difficulties

The next discussion is related to students' empathetic attitudes in resolving these difficulties. Attitude according to the KBBI is that of character or body shape, actions and as such are based on their stance. So the definition of attitude is related to body movements, behavior and actions. Then the definition of empathy according to the KBBI is a mental state that makes a person feel or identify himself in the same state of feeling or thinking as another or another group. According to Byrne & Baron states that empathy is an individual's ability to feel the feelings or experiences of other people (Fitriyanti et al., 2020). So a person's empathetic attitude can share feelings with others in happy or sad situations, the willingness to provide assistance to others both materially and morally and the availability to cooperate with other people in achieving goals. This is in line with Erik Erikson's theory related to psychosocial development. Where Erikson believed that personality develops at several levels. One of the most important factors in Erikson's psychosocial level theory is the development of ego feelings. Ego feelings are conscious feelings that we develop through social interactions. According to Erikson, ego development will always change based on experience and new information obtained in interactions with other people. There are eight levels of development that humans go through according to Erikson. The following are the stages of psychosocial development according to Erikson, namely stage 1*trust versus mistrust* (0-1 year old), stage 2:*autonomy vs Shame* (age 18 months -3 years), stage 3:*initiative vs guilt* (3-6 years), level 4:*industry vs inferiority* (ages 6-12 years), level 5:*identity vs Role Confusion* (12-18 years), level 6:*Intimacy vs Isolation* (18-35 years old), Level 7 :*Generativity vs Stagnation* (35-64 years old), Level 8 :*Integrity vs Despair* (65 years and over). This research focuses on stage 5, namely*identity vs Role Confusion* (at the age of 12-18 years or adolescence). Stage 5 is characterized by the abilities and skills possessed by adolescents trying to form and demonstrate self-identity, characteristics that are unique to oneself. According to Erikson, a teenager has an important role in achieving the level of ego identity or knowing oneself and how to blend in with society. This stage will also experience puberty where at this age you will see and develop a good attitude in terms of compatibility between your content and yourself for other people, and you will even feel like you have become a part of other people's lives. This happens because you have found your identity. The search for ego identity has been going on from the first stage or infancy to the final stage or old age. Therefore, the thing that needs to be paid attention to if the previous stage goes less smoothly or if you don't know and understand who you really are in the midst of your relationships and social structure is called identity confusion. According to Erikson, someone who has fanaticism will think that his thoughts are the best. Vice versa, in chaos the identity is stronger than the ego identity, which is called denial. At this stage, a person will obtain a positive value of loyalty, if ego identity and identity confusion can occur in a balanced manner, where loyalty has the ability to live in accordance with the standards that apply in society regardless of all shortcomings, weaknesses and inconsistencies (Andi & Thahir, 2018)

Based on the results of the interview, if applied in accordance with Erikson's theory, teenagers will find out who they are by showing their own characteristics. In this analysis, it shows that students in class 11 are still looking for who they are, resulting in identity confusion resulting in a lack of empathy towards their peers. As is done by students who focus on coding and continue to do what is best for themselves. In class 11 software and game development based on observations in working on projects. When a friend is behind on material, the smart ones do not show a social spirit towards their classmates. So that teachers can apply learning and innovation skills or what is called 4C, namely*critical thinking,creativity , communication and collaboration* (critical thinking, creative, communication and collaboration). Teachers can implement learning that provides space for collaboration for all students (Simanjuntak, 2019). Since 2018 the government has made HOTS-based learning mandatory, but student readiness has not been tested. This research aims to test students' readiness in implementing HOTS-based learning in Indonesia. Readiness is tested based on the 4C criteria, namely critical thinking, creative, communicative and collaborative (Suharno et al., 2022).

So the results of the discussion result in students' learning achievements being known by using Bloom Dinama's taxonomy theory to determine the level of difficulty in students' understanding and using Erik Erikson's theory related to an empathetic attitude towards difficulties in learning programming. The results of this observation are proven by the collection of application creation project assignments where there are students who complete or succeed by applying their creativity and there are students who only collect what the results of their work are in accordance with their own understanding. When corrected, the results of the students' applications turned out to be the same because the students worked on them by discussing with their peers. Meanwhile, students who have not completed the application results do it themselves without any discussion or help from peers. Of course it is important to apply the 4C skills (*critical thinking,creativity , communication and collaboration)* especially on skills in communication and collaboration between students.

Conclusion

From the results of this discussion, it can be concluded that in learning mobile device programming, it is important to understand the level of student difficulty and the student's empathetic attitude towards the difficulties they face. Erikson's theory of stages of identity versus identity confusion in adolescence suggests that 11th grade students may be searching for identity, which may influence their attitudes toward peers. This can be seen in application creation projects, where some students collaborate with the help of friends, while others focus more on themselves. To measure students' understanding, they can use Bloom's taxonomy theory. Based on observations of project completion, it can reveal the level of students' understanding. Teachers can apply 4C skills, especially collaboration between students, which can be the key to improving understanding and producing better work.

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