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Learners Acceptance of u-KIT EDU as an Educational Application for Robot Building, Coding, and Controlling

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ABSTRAK

Manusia cenderung selalu mencari kemudahan, termasuk memilih aplikasi untuk belajar pemrograman robot. uKIT EDU adalah aplikasi di bidang pendidikan untuk merangkai, memrogram, dan mengendalikan robot. Penelitian ini bertujuan untuk menganalisis tingkat penerimaan pengguna baru terhadap aplikasi uKit EDU tersebut. Penelitian ini dirancang secara kuantitatif dengan melibatkan 116 responden. Kuesioner dalam penelitian ini disusun berdasarkan Technology Acceptance Model (TAM) dengan mengamati 4 variabel yang diamati, termasuk kegunaan yang dirasakan, kemudahan penggunaan yang dirasakan, sikap dan niat perilaku untuk menggunakan. Uji statistik Mann-Whitney U dilakukan dalam penelitian ini untuk membandingkan dua sampel independen, yaitu pengguna baru baik yang berjenis kelamin laki-laki maupun perempuan. Selain itu, uji statistik Kruskal-Wallis H dilakukan untuk membandingkan tiga atau lebih sampel independen berdasarkan perbedaan generasi usia dan pekerjaan. Dari seluruh uji statistik yang dilakukan, diketahui bahwa tidak ada perbedaan yang signifikan dalam penerimaan uKIT EDU dari masing-masing sampel berdasarkan jenis kelamin, generasi usia dan pekerjaan. Mereka sepakat bahwa aplikasi tersebut bermanfaat dan mudah digunakan untuk belajar robotika, pemrograman, dan pengendalian. Secara singkat, penelitian ini mengungkapkan bahwa uKIT EDU cocok bagi pemula dan dapat dijadikan referensi bagi sekolah, lembaga pendidikan, dan orang tua siswa yang tertarik untuk mulai belajar robotika.

ABSTRACT

Humans tend to always look for convenience, including choosing applications to learn robot programming. uKIT EDU is an educational application for robot building, coding and controlling. This study aims to analyze new learners' level of acceptance towards it. This research was designed quantitatively by involving 116 respondents. A questionnaire based on the Technology Acceptance Model (TAM) was organized with 4 observed variables, including perceived usefulness, perceived ease of use, attitude and behavioral intention to use. The Mann-Whitney U statistical test was carried out in this study to compare two independent samples, male and female learners. Moreover, the Kruskal-Wallis H statistical test was carried out to compare three or more independent samples based on age generations and occupations. From all the statistical tests conducted, it was found that there was no significant difference in the acceptance of uKIT EDU from each sample based on gender, age generations and occupation. They agreed that the app was useful and easy to be used to learn robotics, coding and controlling. Briefly, this study revealed that uKIT EDU is suitable for new learners and can be used as a reference for any schools, educational institutions, and parents of students interested in starting to learn robotics.

1. INTRODUCTION

Robots have experienced rapid development over the past decades. In this modern era, robots are not only functioned as toys. More than that, robots can be created with a specific purpose, for example, to assist human work in accelerating work processes and increasing productivity. The existence of the internet and computers has opened up opportunities for anyone who is interested in learning about robots dan programming. A study in Argentina revealed that children aged 3-11 year old students with a multilanguage robot programming platform (using drag and drop, Python and C++ languages) have been able to learn sequences, conditionals, loops and parameters (Martinez et al., 2015; Soriano et al., 2014). Through an introductory programming language about robots, children can understand the logic and structure of programming so that in the future, they can decipher and analyze millions of data through programming that they have mastered (Arisandi, 2016; Husni et al., 2019).

Meanwhile, previous research in Indonesia also revealed that Vocational School teachers who had received Artibo Artificial Intelligence (AI) Robot training stated that they had gained new insights about robots

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which are very important to prepare students (Purbohadi, 2022). Meanwhile, at the basic education level, learning robotics for supervisory teachers and elementary school students is one of the efforts to become a generation ready to face all the challenges of the industrial revolution 4.0 and society 5.0 era (Faridawati et al., 2020). Interestingly, a study uses UBtech Humanoid Robot as a learning medium for autistic students, although it still needs development (Febtriko et al., 2019). Thus, anyone can learn robot programming, both children and adults. A study in one of Bandung's high schools revealed that robotics could foster STEM (Science, Technology, Engineering and Mathematics) education and improve logical thinking, creativity, innovation, problem-solving, and teamwork skills (Asri, 2018; S. Zubaidah, 2019). A similar study was also revealed that in a literature study on the application of robotics in STEM learning in basic education, considered to be able to involve students cognitively, behaviorally and emotionally so that it can affect student motivation (Aristawati & Budiyanto, 2017).

Humans tend to always look for convenience, including choosing applications to learn robot programming. However, the selection of educational application for robot programming remains largely unknown to both researchers and educators. They came up with the questions regarding the essential applications for robot building, coding, and controlling. A former study mentioned that learning robot programming early provides many benefits, including improving fine motor development. It can be trained and developed through continuous activities and stimuli regularly. For example, playing puzzles, and arranging objects to form the desired pattern, such as robots, cars, houses, animals, etc. They might affect children's independence and confidence because they know their physical abilities (Maghfiroh & Suryana, 2021; Mufarola & Murbowo, 2019). Previously, there was research using the LEGO WeDo robotics construction kit and the Creative Hybrid Environment for Robotic Programming (CHERP) programming language (Strawhacker & Bers, 2015). The findings in that study suggest a slight relationship between the user interface and programming comprehension, although there may be an influence of order when introducing the user interface.

Currently, an application known as uKIT EDU has been used by the Artificial Intelligence Center Indonesia (AICI), a group founded in collaboration of FMIPA College of Indonesia with UMG IdeaLab Indonesia. uKIT EDU is one of the educational applications that may be used for robot building, coding and controlling. It was developed by UBTech Education (Shenzhen) Co.,Ltd which created consumer-facing robots for science, technology, engineering and mathematics (Gina & Alison, 2021). This app basically works with some uKit hardwares, including the main control box, servo, sensors and bricks which adopts a building block design scheme like LEGO technology and uses a graphic programming language to provide a simple way to study coding logic (Chen et al., 2020). A graphic programming language is one of the advantages made by the uKIT EDU app developers considering that previous research conducted by (Wibowo & Veronica, 2022) revealed that one of the difficulties learners face when learning programming languages.

UKIT EDU users may develop different types of models and use different tools including programming through the official curriculum. One of the robots made by UBTech is the Humanoid Alpha robot, in a research it is stated that does strengthen the teaching-learning of gross motor skills (Machay et al., 2022). In another study, the use of Lego Mindstorms robotic constructs and the App Inventor visual programming environment was taught to understand basic programming structures (Papadakis & Orfanakis, 2017). Furthermore, uKIT EDU application is still relatively new, so there is still very few research, especially in Indonesia that discusses new learners' acceptance of the use of uKIT EDU in learning robots. Therefore, this is a novelty in this research.

Some studies dealing with Technology Acceptance Model (TAM) indicate the popularity of TAM in the field of technology acceptance in general (Al-Emran & Granić, 2021; Hong et al., 2021; Rafique et al., 2020). TAM is often used to analyze users' acceptance of an application. A previous study used TAM to measure students' acceptance of using the Zoom Application in a language course (Alfadda & Mahdi, 2021). Similar research using TAM also examined how the acceptance of e-study application technology by Engineering faculty students during online learning is carried out (Sefriani & Sepriana, 2022). The current study uses TAM to capture insights into user or new learners' acceptance to the uKIT EDU application used for robot building, coding, and controlling.

This study aims to analyze new learners' level of acceptance towards using the uKIT EDU app for learning robotics. A survey was conducted in a short course on introduction to robotics and artificial intelligence held by Artificial Intelligence Center Indonesia (AICI) in collaboration with Research Center for Education of The National Research and Innovation Agency. Participants across multidisciplinary backgrounds and generations attended the current research. A modified questionnaire based on the Technology Acceptance Model (TAM) was organized in this study (Taufiq et al., 2019). 4 variables will be observed, including perceived usefulness, perceived ease of use, attitude and behavioral intention to use.

2. METHOD

This study is designed as a quantitative descriptive and comparative analysis (Reza et al., 2021; A. Zubaidah. et al., 2017). The data from the modified questionnaire were investigated using descriptive statistics to answer the first research question about the learners' acceptance in using uKIT EDU App. For the second question,

researchers applied a statistical test to investigate the difference attitude between male and female participants toward the acceptance of uKIT EDU at the 0.05 level (2-tailed) of significance. The last two questions, researchers also applied a statistical test to investigate the difference attitude among learners form different age generations and occupation backgrounds toward the acceptance of uKIT EDU App at the 0.05 level (2-tailed) of significance. Furthermore, Google spreadsheet was used to recap data from respondents. IBM SPSS 26 statistics application was used to analyze the questionnaire data quantitatively.

This study used primary data from 116 new learners who have contributed in a short course on introduction to robotics and artificial intelligence. They are students, teachers, lecturers, and educational enthusiast and ranged in age from 16 to 55 years old. They haven't learnt to use uKIT EDU before. At the beginning of the session, participants were given the basic theory of robotics and artificial intelligence. Then they were divided into several groups to practice in building, coding, and controlling the robot using the program available in uKIT EDU. At the end of the session, the researcher gave a questionnaire to the participants to investigate level of acceptance towards the use of uKIT EDU app for learning robotics.

The primary data for study were collected through a Likert scale survey questionnaire which was made using google form. It is a common way to examine the extents of the respondents' agreement on the statements given for the items in the questionnaire. A five-point Likert scale was used in study from (1) Strongly disagree, (2) Disagree, (3) Nature, (4) Agree, (5) Strongly agree. The questionnaire in study was adapted and modified from previous research which used elements in the Technology Acceptance Model (TAM) to investigate the users' acceptance towards the use of mobile digital games for learning Arabic language in the context of higher education in Malaysia (Taufiq et al., 2019).

The process of content validation and construct validation is an important factor in the instrument development process. Content validity requires a rigorous assessment process as the information obtained from this process is invaluable to the quality of the newly developed instrument (Almanasreh et al., 2019). In this study, two experts of independent raters checked its validity for both content and construct. Moreover, to avoid misunderstanding, all questionnaire items were composed in Bahasa Indonesia. The SPSS 26 program is used as a tool to carry out the reliability and validity tests. The reliability score was confirmed as in Cronbach's alpha. The value of Cronbach's alpha 0.7 or higher indicates acceptable internal consistency (Taber, 2018). The result of reliability test presented in Table 1 below. Furthermore, the validity of the questionnaire was compatibly tested using the Pearson Product Moment correlation coefficient (r) at a .05 level of significance (Sobri et al., 2019). Based on the results, Sig. value for each item ($p < \alpha$=.05) indicated that the questionnaire is valid as show in Table 2.

Base on Table 1 perceived Usefulness (PU) refers to user's perception on whether using technology, in this case, uKIT EDU App, could improve their performance in learning robotic. In this study, perceived usefulness was measured through three items. Perceived Ease of Use (PEU) means how learners perceive that the use of uKIT EDU App for Robot programming only require least effort. Current study, perceived ease of use was measured through three items which were designed to fit the context of this study. Attitude (AT) represent how learners evaluate and assess behavior when using the uKIT EDU App such as harmful or beneficial, good or bad, and pleasant or unpleasant. Attitude was measured through three items developed based on the context of this study. Behavioral Intention to Use (BI) describes a person's willingness to use the uKIT EDU App now and in the future. This construct was measured through two items that were developed to fit the research context. These responses for these items are tabulated in the Table 2.

Table 1. Reliability Test Result

Constructs	Cronbach's Alpha	Number of Items	Internal Consistency
Perceived Usefulness (PU)	0.904	3	Excellent
Perceived Ease of Use (PEU)	0.841	3	Good
Attitude (AT)	0.899	3	Good
Behavioral Intention to Use (BI)	0.877	2	Good

Table 2. Operational Definition of The Variables

Operational Definition	Measured Items	Sig.	Criteria
Perceived usefulness (PU) reflects user' perception on whether the use of the uKIT EDU App will enhance their performance in understanding robots' programming.	PU1: uKit EDU app will improve my learning performance. (Q1)	0.000	Valid
	PU2: uKIT EDU App will enhance the effectiveness of learning robots' programming. (Q3)	0.000	Valid
	PU3: I find the uKIT EDU App useful. (Q4)	0.000	Valid

Operational Definition	Measured Items	Sig.	Criteria
Perceived ease of use (PEU) refers to a user's perception that using uKIT EDU App for understanding robots' programming will require minimal effort.	PEU1: I find the uKIT EDU App is easy to use. (Q2)	0.000	Valid
	PEU2: Learning how to use uKIT EDU App is easy for me. (Q5)	0.000	Valid
	PEU3: It will be easy for me to find information through the uKIT EDU App. (Q6)	0.000	Valid
Attitude (AT) refers to user's judgement on whether the use of the uKIT EDU App is beneficial to them.	AT1: Studying robot's programming using uKIT EDU App is a good idea. (Q7)	0.000	Valid
	AT2: I feel positive towards the use of uKIT EDU App (Q8)	0.000	Valid
	AT3: I believe that it is a good idea for me to use this the uKIT EDU App for my future coursework. (Q9).	0.000	Valid
Behavioral intention (BI) refers to user's intention to actually use the uKIT EDU App for learning robots' programming at present and in the future	BI1: I intend to frequently use uKIT EDU App to learn to program a robot (Q10)	0.000	Valid
	BI2: I will intend to use uKIT EDU App throughout this year and the next. (Q11)	0.000	Valid

3. RESULT AND DISCUSSION

Result

Tabel 3. Demographic Information of Participants

Categories	Number	Percentage
Gender		
Male	84	72.4%
Female	32	27.6%
Total	116	100%
Age Range		
10 – 25 years (Gen Z)	61	52.6%
26 – 41 years (Gen Y)	37	31.9%
42 – 57 years (Gen X)	18	15.5%
Total	116	100%
Occupation		
Teacher	44	37.9%
College students	44	37.9%
High school students	15	12.9%
Education enthusiast	13	11.3%
Total	**116**	**100%**

Base on Table 3, A hundred and sixteen participants in a short course on robot programming with uKIT EDU App took part in this study. They completed the online questionnaire at the end of the course. There were 52 more males than female participants in this study. Then if we look at the age range, this study is dominated by Gen Z as many as 61 participants, namely children born in 1997-2012. Meanwhile, the second largest number of participants by generation range is Generation Y/Millennial with 37 participants and Generation X with the least amount of 18 participants. Finally, the distribution of participants based on the current status is 44 participants as teachers, 44 participants as college students, 15 participants as high school students, and 13 participants as observers in the field of education/ education enthusiast.

The leaners' Acceptance In using uKIT EDU App of Robot Building, Coding, and Controlling

The results of the quantitative descriptive statistics obtained means score (M) and standard deviation (SD) of each variable in the TAM which consists of 11 question items. These results can be seen in Table 4.

Table 4. Learners' Acceptance In Using Ukit Edu App

Constructs	Items	N	M	SD
Perceived Usefulness (PU)	Q1	116	4.68	0.584
	Q3	116	4.70	0.531
	Q4	116	4.69	0.596
Average PU			**4.69**	
Perceived Ease of Use (PEU)	Q2	116	4.66	0.634
	Q5	116	4.61	0.682
	Q6	116	4.59	0.633
Average PEU			**4.62**	
Attitude (AT)	Q7	116	4.64	0.566
	Q8	116	4.62	0.655
	Q9	116	4.50	0.752
Average AT			**4.58**	
Behavioral Intention to Use (BI)	Q10	116	4.42	0.846
	Q11	116	4.45	0.738
Average BI			**4.43**	
Total Average			**4.59**	

Table 4 shows that the Perceived Usefulness (PU) variable has the highest average score found in Q3 (M=4.70). The inquiry is closely related to the uKIT EDU application increasing the effectiveness of robot programming learning. The second highest average score is obtained from Q4 (M=4.69), it says that the uKIT EDU app is helpful for learners to study robotics. At the same time, the lowest score on this variable was obtained from Q1 (M=4.68), which is related to the uKIT EDU application helping improve learners' performances in learning robotics. Moreover, the average mean score of all questions in the PU variable was more than four (M=4.69), indicating that most participants believe the uKIT EDU Application will improve their learning performance.

The highest average score in the Perceived Ease of Use (PEU) was obtained from question item Q2 (M=4.66). This question is closely related to the ease of using the uKIT EDU Application to understand robot programming. The second highest score is found in Q5 (M=4.61). It was about the ease of the uKIT EDU Application for learners to understand. The lowest score in PEU was found in Q6 (M=4.59), which is related to the ease of finding information from the uKIT EDU App. Furthermore, the average mean score of all questions in the PEU variable was more than four (M=4.62), indicating that most participants trust that the uKIT EDU application can help them complete work.

Furthermore, on the variable Attitude (AT), question item Q7 (M=4.64) has the highest average score, followed by question item Q8 (M=4.62). Question item Q7 is closely related to learner attitudes in learning robotics programming through the uKIT EDU application is one of the right choices. At the same time, question item Q8 relates to learners' motivation to learn robotics through the uKIT EDU application. The lowest score in AT was found in Q9 (M=4.50), which is related to the learners' attitude that using the uKIT EDU App in the future to study robotics is the right decision.

Then on the Behavioral Intention to Use (BI) variable, the highest average score was obtained from question item Q11 (M=4.45), related to the willingness of participants to use the uKit EDU application to learn robot programming this year and the following year The second highest score is found from Q10 (M=4.42). It was about the participants' occurrence to use the uKit EDU application to learn robot programming. Furthermore, the average mean score of all questions in the BI variable was more than four (M=4.43), indicating that most participants intent to use the uKIT EDU application continuously.

Learners' Acceptance in using uKIT EDU App based on Gender

Previously, a normality test was conducted to see whether sample data from the current study had been drawn from a normally distributed population. The normality test is carried out because it will determine the next type of statistical test whether it is parametric with the independent sample t-test or non-parametric with the Mann-Whitney U test. The result showed that the data were not normally distributed and were substantial negative skewness or skewed to the left. Data transformation is then carried out by changing the existing data with the LG10(k-x) formula because the graph is in the form of substantial negative skewness. After the transformation, the data is then tested again for normality. It turns out that the results remain the same, that the data is not normally distributed. Therefore, the Mann-Whitney U non-parametric statistical test was carried out in this study to compare two independent samples, in this case, men and women (gender). The SPSS 26 program is used as a tool to carry

out the Mann-Whitney U test for all variables: Perceived Usefulness (PU), Perceived Ease of Use (PEU), Attitude (AT), and Behavioral Intention to Use (BI). The results of the statistical test can be seen in the Table 5.

Table 5. Test Statistics[a] Result Based On Gender

	PU	PEU	AT	BI
Mann-Whitney U	1297.500	1300.500	1217.500	1114.500
Wilcoxon W	4867.500	1828.500	1745.500	1642.500
Z	-.345	-.302	-.868	-1.561
Asymp. Sig. (2-tailed)	.730	.763	.386	.119

Based on the Table 5 Test Statistics[a] Result Based on Gender output above, it is known that the value of Asymp. Sig. (2-tailed) of Mann-Whitney U for PU, PEU, AT, and BI based on gender consecutively: 0.730, 0.763, 0.386, 0.119 > α = 0.05. So, it can be concluded that there are no significant differences in regarding Perceived Usefulness, Perceived Ease of Use, Attitude, and Behavioral Intention in using the uKIT EDU App for robot building, coding, and controlling to both male and female participants. In other words, both men and women agree (M=4.59) that the uKIT EDU App will enhance their performance in understanding robots' programming, require minimal effort, be beneficial to them, and be used by them for learning robots' programming at present and in the future.

Learners' Acceptance in using uKIT EDU App based on Age Generations

Furthermore, the Kruskal-Wallis H non-parametric statistical test was carried out because all data distribution was not normally distributed. Kruskal-Wallis H is used because in the age generations there are 3 samples (10 – 25 years/Gen Z group, 26 – 41 years/Gen Y group, 42 – 57 years/Gen X group) which are not paired. The result of the Kruskal-Wallis H test will provide a decision if the Asymp. Sig. > 0.05, there is no difference between samples and if the Asymp. Sig. < 0.05 then there is a difference from each sample. The result of test statistics[a,b] based on age generations is show in Table 6.

Table 6. Test Statistics[a,B] Based On Age Generations

	PU	PEU	AT	BI
Kruskal-Wallis H	0.764	1.963	0.227	0.801
Df	2	2	2	2
Asymp. Sig.	0.682	0.375	0.893	0.670

From Table 6, it is known that the value of Asymp. Sig. (2-tailed) of Kruskal-Wallis H test for PU, PEU, AT, and BI based on age generations consicutively: 0.682, 0.375, 0.893, 0.670 > α = 0.05. So, it can be concluded that there are no significant differences in regarding Perceived Usefulness, Perceived Ease of Use, Attitude, and Behavioral Intention in using the uKIT EDU App for robot building, coding, and controlling among Gen X, Gen Y, and Gen Z participants. To put it another way, all participants across generations agree (M=4.59) that the uKIT EDU App will enhance their performance in understanding robots' programming, require minimal effort, be beneficial to them, and be used by them for learning robots' programming at present and in the future. In line with the result of the previous study that generation was not a determining factor in students' use of digital technologies.

Learners' Acceptance in using uKIT EDU App based on Occupations

The Kruskal-Wallis H test was once more carried out because all data distribution was not normally distributed, and there were four samples based on occupations. This time the Kruskal-Wallis H test was carried out to see if there were significant differences in the views of learners with different professions or educational backgrounds in using uKIT EDU as an educational application for robot building, coding, and controlling. Participants in this survey are divided into four professions or educational backgrounds including: teachers, college students, high school students, and education enthusiasts. The result of the Kruskal-Wallis H test will provide a decision if the Asymp. Sig. > 0.05, there is no difference between samples and if the Asymp. Sig. < 0.05 then there is a difference from each sample. Test statistics[a,b] based on occupations is show in Table 7.

Table 7. Test Statistics[a,B] Based On Occupations

	PU	PEU	AT	BI
Kruskal-Wallis H	1.913	2.604	0.869	3.013
df	3	3	3	3
Asymp. Sig.	0.591	0.457	0.833	0.390

Based on Table 7 show the test statistics[AB] based on occupations result, it is known that the value of Asymp. Sig. (2-tailed) of Kruskal-Wallis H test for PU, PEU, AT, and BI based on occupations consecutively: 0.591, 0.457, 0.833, 0.390 > α = 0.05. So, it can be concluded that there are no significant differences in regarding Perceived Usefulness, Perceived Ease of Use, Attitude, and Behavioral Intention in using the uKIT EDU App for robot building, coding, and controlling among teachers, college students, high school students, and education enthusiasts. That is to say, all participants across different educational backgrounds and professions agree (M=4.59) that the uKIT EDU App will enhance their performance in understanding robots' programming, require minimal effort, be beneficial to them, and be used by them for learning robots' programming at present and in the future.

Discussion

Overall, new users of the uKIT EDU application agree that this program is acceptable to them. In terms of usefulness, new users agree that this program is so beneficial. A previous study also mentioned that PU in TAM model also might impact learners' preference to use a new program and subsequently influence the system's acceptance (Cooper & Sánchez, 2016; Siti et al., 2021). Furthermore, new users also agree that this uKIT EDU application is easy to use and they are also happy to use this application in the future. This findings is similar to the previous study revealed that perceived ease of use in technology acceptance research has direct and indirect effects towards behavioural intention (Lai & Hong, 2015; Wong et al., 2013). Similarly, previous study found that perceptions of ease of application and usability are important considerations for users in selecting and adopting applications (Nugroho et al., 2017). It has been reaffirmed that development of positive attitudes among perceived ease of use, perceived usefulness, and behavioral intention are important for the acceptance of most new technologies (Kim et al., 2021). In line with the previous research conducted stated that the perceived benefits and ease of use would increase students' intentions to use the system (Abdullah et al., 2016). It turns out that the results of this study also show that when respondents agree that uKIT EDU is useful for them, they will accept it and culminate in a decision to use it.

Regarding Learners' acceptance in using the uKIT EDU App, it is known that there is no difference in acceptance based on gender. The result of this study might say that uKIT EDU is user friendly among female users. In contrast to research conducted in Taiwan with a study involving 67 women and 89 men at the Hsin-Chu Science-based Industrial Park. Previous study states that women's rating of computer self-efficacy, perceived usefulness, perceived ease of use and behavioral intention to use e-learning are lower than men's (Ibrahim et al., 2018). Other research conducted in their meta-analysis of a total of 50 articles from 1997 to 2014 showed that males also tend to have more favorable attitudes toward technology use than females, even though the difference has a small effect size (Cai et al., 2017). However, other study also state the adoption of mobile commerce in Jordan based on TAM3 theory, which states that the moderation role of gender does not affect the adoption process of mobile commerce (Faqih & Jaradat, 2015). It raises the idea for researchers that gender in technology is very interesting to be studied more deeply.

Users of all generations in this study accepted the uKIT EDU application because of its usability and convenience. In line with the result of the previous study that generation was not a determining factor in students' use of digital technologies (Lai & Hong, 2015). Although other research conducted shows that Generation Z is a generation of technology that considers technology very necessary, in this study, there is no difference in acceptance of uKIT EDU app with other generations (Berkup, 2014). A study conducted found that the existence of a slight inter-generational difference when it comes to the case of problem-solving (Khan & Vuopala, 2019). Another interesting finding was also conveying that in the older generation when they lack clarity, instructions, and support; they voiced apprehension (Vaportzis et al., 2017). Nonetheless, most of our participants in the study were eager to adopt new technology and willing to learn using a tablet. Therefore, differences in age and generation are not an obstacle to learning new programs, and uKIT EDU in this study can be accepted by users across ages and generations.

Another finding in this study is that there is no difference in acceptance of uKIT EDU applications based on work and educational/academic backgrounds. Not many studies have investigated the use of technology from various educational and occupational backgrounds. In a systematic literature review on identifying factors that influence acceptance of electronic technology for aging in place stated that two other variables not present in the reviewed qualitative research were studied: gender and level of education (Peek et al., 2014). Some studies only look at the perception of technology use from a group with the same work background. As was done by previous study regarding the Effectiveness of Google Classroom: Teachers' Perceptions which concluded that teachers had implemented Google Classroom for at least one semester in their classroom, indicating the lack of a user-friendly interface is the main reason for its inefficiency (Azhar & Iqbal, 2018). Therefore, other researchers may try to investigate the use of technology from various views of users from different educational and occupational backgrounds.

The present study attempts to address several gaps and makes essential contributions. First, this study adds a new reference for readers, especially educators or school managers, in using the uKIT EDU application for robot programming. Our study is among the first to consider users' first impressions of using uKIT EDU. Second, related to the usefulness and ease of use of the uKIT EDU application. This study can explain the usability and convenience of users with different educational backgrounds, ages and occupations. Third, there is no previous research to the best of the author's knowledge and a search in the google scholar database that empirically explored user acceptance in using uKIT EDU to learn robot programming. However, previous research explores other applications for robot programming in informatics and computer science classes called mBot (Pisarov & Mester, 2019). This research revealed that mBot was also readily accepted by students.

This study has implications for the uKIT EDU application's importance in learning robot building, coding, and controlling. It was found that anyone could do it or in other words was user friendly. Especially in preparing the next generation to be skilled at using technology and increasing the nation's competitiveness, robotics learning needs to be disseminated and studied by various groups. Meanwhile, this study has several limitations, such as the research method in this paper is only continued with a quantitative approach model. It is recommended to the upcoming researchers to get further or deepen findings. They might conduct interviews with the learners through a qualitative method or mixing methods which combine quantitative and qualitative approaches. In addition, the respondents of this research are only limited to those who live in areas around the capital city of Jakarta and who are familiar with the technology. Therefore, expanding the population and sample is highly recommended to get more comprehensive illustrations and factors.

4. CONCLUSION

This research reveals that the acceptance of using uKIT EDU as an educational application for robot building, coding, and controlling is generally approved by users. In another word, uKIT Edu can be said to be user-friendly for new learners. This application is suitable for use by any gender, learners from across generations (Gen X, Gen Y, and Gen Z), and backgrounds (teachers, college students, high school students, and education enthusiasts). All new learners agree that the uKIT EDU application can be beneficial in helping to learn robot building, coding and controlling. In addition, all learners also agree that the uKIT EDU application is easy to use. All new learners involved in this research also like this application and plan to use this application for learning about robotics in the future. The results of this study can be used as a reference for any schools, educational institutions, and parents of students interested in starting to learn robotics might consider using the uKIT EDU application to assist in learning robot building, coding, and controlling.

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