JARIMU Application as a Self-Development Medium for Children with Intellectual Disabilities

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Abstract: Introducing money is a self-development skill for children with intellectual disabilities that is very important in their lives. However, this is often a problem and is misunderstood by children with intellectual disabilities. This confusion occurs because they are often presented directly as money, while their value and function are not well understood. As a result, the direct use of money as a medium becomes less attractive, has no meaning, and is only used as a toy that has no direction. The purpose of this research is to develop an Android-based learning medium that can help people with intellectual disabilities understand money as a whole. This study uses a mixed method with a sequential exploratory model design. This application test uses the Black Box, and the results show that the JARIMU application can be used operationally properly. Based on the feasibility test, the JARIMU application has a very good acceptance rate with a percentage of 86.029%. The implications of these findings are suggested to be applied by schools or teachers in introducing money for children with intellectual disabilities.

Keywords: JARIMU app; Know Money; Children with Intellectual Disabilities

INTRODUCTION

Intellectual disability refers to a general intellectual function that is significantly below average along with deficiencies in self-adjustment behavior (adaptive behavior) and lasts in the period of its development (Rochyadi, 2012; Putri et al., 2022; Sartinah et al.,2023) Behavioral barriers to intellectual disabilities can be seen in two areas: personal areas and social areas (Kristiana & Widayanti, 2021). Individual life skills include caring for yourself and helping yourself (personal living skills), while social living skills include communicating, socializing, and filling free time.

The Self-Development Program is very important for people with intellectual disabilities (Ediyanto, 2021). This program is directed at developing the child's abilities related to his own life so that they do not burden others. One of the social self-development programs is life skills (knowing money well). This skill of knowing money is needed early to form a smart character in managing money (Sadri, 2019).

Based on the results of assessments of parents, teachers, and subjects conducted by researchers at SLB Negeri Kota Depok, information was obtained that the subjects needed self-development programs, especially knowing money. Some teachers and parents have difficulty introducing money through learning media. In the learning process in schools, guru still uses real money, which turns out to be unattractive to children because it may not have meant for them and is only used as a toy. They need a learning medium that can make it easier for people with intellectual disabilities to understand learning (HN, Al-Usrah, and Dewa, 2023). Currently, technological developments can be used to create learning media that can support the quality of education (Ariesta, 2019).

JARIMU is an acronym for belaJAR mengenalI macam-macaM Uang (Learn to Recognize Types of Money). The JARIMU app is designed differently from the previous media. Previous research presents the introduction of money starting from IDR 100 to IDR 20,000 and the sum of money (Martian & Al Irsyadi, 2021). The JARIMU application is an

android-based application that contains the basic concepts of types of money, starting from the introduction of paper money, coins, and electronic money, the value of money, and the function of money, designed through game-based learning. The use of Game-based Learning means the existence of games in the context of education to achieve educational goals (Stiller & Schworm, 2019). This researcher designed it because Game-Based Learning turns out to have an influence on motivation and learning achievement (Winata, K.R., and Setiawana, 2020). Through the JARIMU application, it is hoped that it can attract the attention of students with intellectual disabilities to learning in accordance with the opinions of Yong et al. (2016) and Luhsasi & Permatasari (2020), which state that the nature of the learning process will be very interesting and increase students' interest in learning if done by combining encouragement and games. It will even be more effectively used as a medium for independent exercise (Sidarta & Yunianta, 2019). The purpose of this research is to test the feasibility of applications developed based on the learning needs of students with intellectual disabilities. The skill of knowing money is one of the most important self-development programs for people with intellectual disabilities. The skill of knowing money is needed from an early age to form intelligent character in managing money.

METHOD

This study used mixed methods with a sequential exploratory model design (Creswell & Plano Clark, 2007). This design is carried out by carrying out qualitative research first and then quantitative research, in accordance with the opinion of Cresswell (2007), who states that a sequential exploratory strategy in mixed methods research involves a first phase of qualitative data collection and analysis followed by a second phase of quantitative data collection and analysis that builds on the results of the first qualitative phase.

1. Participants in this study were 1 child with intellectual disabilities, 1 parent of a child with special needs, 1 principal, 14 SLB teachers, 1 lecturer, and 2 learning technology developers (PTP).

2. Population and Sample. Sampling for quantitative research is done with the probability sampling cluster sampling technique (sample by class), while sampling for qualitative research is done with the probability sampling purposive sampling technique (Samsu, 2017). The population in this study had intellectual disabilities in SLBN Depok City, while the sample had class IV intellectual disabilities in SLBN Depok City.

3. Research place. This research was carried out at SLBN Depok City, which is located at Regency, Peumahan Permata, Jl. Raya Citayam, Ratu Jaya, Cipayung District, Depok City, West Java 16439.

4. Data Collection Techniques The data collection that will be used by researchers is done using qualitative and quantitative techniques in accordance with the research design used.

   a. Qualitative data collection techniques

      1) Self-development assessment; Observations using self-development instruments that refer to program guidelines for special needs self-development for intellectual students (Ediyanto, 2021).

      2) Interviews with teachers and parents to get thorough information about the subject's abilities, barriers, and needs

      3) Documentation collects materials and information on theories and concepts that support research through written documents.

b. Quantitative data collection techniques
1) Test the system using Black box testing. Black box testing is software quality testing that focuses on software functionality. Black box testing aims to find incorrect functions, interface errors, errors in data structures, performance errors, initialization errors, and termination (M. Sidi Mustaqbal, 2015).
2) The questionnaire was used by researchers to obtain responses to an application consisting of 11 questions with scores using a Likert scale.

Table 1. Assessment Criteria and Scores

No.	Criteria	Score
1	Strongly Agree (SS)	5
2	Agree (S)	4
3	Neutral (N)	3
4	Disagree (TS)	2
5	Strongly Disagree (STS)	1

5. Data Analysis Techniques
   a. Qualitative Data Analysis using data reduction, data presentation, and conclusions.
   b. Quantitative data analysis by calculating the total score obtained by each respondent, then determining the percentage by means $\frac{obtained\ score}{maximum\ score} \times 100\%$, which is then the percentage interpreted based on the following table:

Table 2. Validation Qualifications

Percentage (%)	Validation Criteria
76% - 100%	Very decent; no need for revision.
51% - 75%	Feasible and does not need to be revised.
36% - 50%	Quite feasible, but needs revision.
$\leq 35\%$	It's not worth it and needs to be revised.

Source: (Arikunto S., 2010)

FINDING AND DISCUSSION

The term intellectual disability evolved over time, starting with mental retardation issued by the AAMR (American Association of Mental Retardation) in the 1961s, then mental deficiency issued by the AAMD (American Association of Mental Deficiency), to become the term intellectual impairment issued by the AAIDD (American Association of Intellectual and Developmental Disabilities) in 2002.

According to the American Association of Intellectual and Developmental Disabilities (AAIDD, 2014), intellectual disability is a disability characterized by significant limitations in both functions, namely intellectual functioning and adaptive behavior, which include many everyday social and practical skills. This incompetence occurs before the age of 18. Meanwhile, according to Kemis & Rosnawati (2020), children with intellectual intelligence barriers or disabilities are individuals who have an IQ of 70 or below based on standard intelligence tests and have deficiencies in adaptive behavior that occur during development.

Adaptive behavioral barriers can be seen in two areas, namely personal living skills and social living skills (Ediyanto, 2021). Personal living skills are individual life skills such as caring for, taking care of, and helping themselves, while social living skills are

social life skills including communicating, socializing, and filling free time. Self-development programs affect the independence of people with intellectual disabilities (Kurniawan, 2012; Subasno, Nini, & Densi 2022). According to the Ministry of Education, Culture, Research, and Technology (2021), the scope of the self-development program for children with mental disabilities includes seven components: (1) Taking care of yourself, such as eating, drinking, and hygiene; (2) Taking care of yourself, such as dressing and decorating; (3) Helping yourself, such as maintaining safety and overcoming danger; (4) communicating, such as verbally (oral, written, gestures, pictures), and nonverbally (body language, communication with objects). (5) Socializing, such as socializing with the family environment, schools, and communities; (6) Life skills, such as money use skills, shopping skills, and skills at work; (7) Filling free time, such as sports activities, art, and simple skills such as raising plants or animals. One of the principles of the self-development program is based on the results of the assessment. Broadly speaking, assessments can be grouped into two categories: academic assessment and developmental assessment (Atmaja, Zaroni, & Yusuf, 2023). Academic assessment delves into academic abilities and skills such as reading, writing, and numeracy, whereas developmental assessment focuses on aspects related to prerequisite skills necessary for academic success (Yuwono, 2015).

1. The assessment that the researchers conducted focused on aspects of self-development that related to taking care of themselves, self-help, communication, socialization and adaptation, and other life skills. Children's abilities are viewed with the criteria C = capable, WH = with help, and NYC = not yet capable. Here is a recap of the assessment results that the researchers obtained.

Table 3. Results of Self-Development Assessment

No.	Scope	Number of indicators	C	WH	NYC	% Barriers
1	Take care of yourself.	11	8	0	3	27%
2	Take care of yourself	31	26	1	4	13%
3	Help yourself.	15	11	0	4	27%
4	Communication	10	5	4	1	10%
5	Socialization and adaptation	11	10	1	0	0%
6	Other Life Skills	9	1	2	6	67%

Based on the results of the assessment, it can be concluded that the subject experienced the highest obstacles in other aspects of life skills. Indicators that fall within the scope of other life skills are described in Table 4.

Based on the results of the assessment, there are many needs for the subject, but if it refers to priorities, then the program that will be prioritized for the subject is the Self-Development Program with the scope of skills to use money.

According to the Big Indonesian Dictionary, money is a legal medium of exchange or standard measure of value (unity of count) issued by the government of a country in the form of paper, gold, silver, or other metals printed with certain shapes and images. The functions of money are (1) medium of exchange, (2) store of value, (3) units of account, and (4) measures of delayed payments (standard for delayed payment) (Solikin & Suseno, 2002). In general, the types of money are divided into two categories: currency and giral money. In Indonesia, currency is a banknote and metal money circulating in the community issued and circulated by Bank Indonesia.

Table 4. Other Life Skills Scope Self-Development Program Indicators

Shopping	Can shop at stalls
	Mention the item to buy
	Give money according to the price of the goods purchased
	Bring your own groceries well
	Buying elsewhere when the item to be purchased is not available
Walking in public places	Walking in the space provided (sidewalk)
	Cross the road in the space provided
Using public transportation services	Can use public transportation
	Knowing the route from home to school or vice versa

According to Bank Indonesia Regulation No. 21/10/PBI/2019 concerning Rupiah Currency Management Chapter 1 Article 1 No. 6, it is stated that paper money is Rupiah notes in the form of sheets made of Paper money, and No. 7, it is stated that Metal Rupiah Money is Rupiah Money in the form of coins made of metal money.

Financial education is very important for all ages. Education about managing money well must be started from an early age, especially for pre-school children and elementary school-age children, in an effort to build a smart character in managing money (Sadri, 2019).

Learning media for introducing money to existing intellectuals are montage learning media (Nuriyanti, Mulia, & Abadi, 2021), money books (Retnowati, 2019), Modified Snakes and Ladders games (Yanti, 2019), and role-playing (Alpiani, & Hasan, 2019). Interactive multimedia can improve the ability to thicken the value of money for light intellectual students (Siregar, 2020).

The JARIMU application is one solution that researchers strive to use to help children with intelligence (intellectual) barriers in self-development programs. Competency life skills aspects include knowing money well. The three learning outcomes in this application are knowing the type of money, knowing the value of money, and thickening the value of money as a means of payment. Here are the results of the research on the JARIMU application, Knowing Money, for children with intelligence barriers at SLBN Depok City.

2. JARIMU App View

Table 5. JARIMU App View

	Home Menu, the initial display before entering the application
	Contains the app title, app designation, and start button. If the start button is pressed, the main menu display will appear.

	Main Menu. There are two types of buttons on the main menu: the type of money and the value of money.
	Money Type Menu There are 3 types of money found in the money type menu: paper money, coins, and electronic money.
	Banknote Menu. Children are asked to put a number of banknotes into the wallet provided. The wallet will open automatically if money is to be put in it, and vice versa, if money has already been put in it, the wallet will automatically close. When the money is withdrawn into the wallet, a voice will appear stating the nominal value of the money. The number of banknotes provided is 15, referring to the types of money that apply in Indonesia (Bank Indonesia, 2021).
	Finished inserting paper money. If the child has finished inserting all the paper money, then there will be a congratulatory tone.
	Coin Money Menu. The child is asked to put a number of coins in the jar that has been provided. When the money is pulled into a clear jar, a voice will appear that mentions the nominal value of the money. The number of coins provided is 15 with reference to the type of money applicable in Indonesia (Bank Indonesia, 2020).
	Finished putting in the coins. If the child has finished putting in all the coins, then there will be a congratulatory display.
	Electronic Money Menu. Children are asked to put a certain amount of electronic money into the wallet provided. The wallet will open automatically if the electronic money is to be entered and vice versa, if the electronic money has been put in the wallet, then the wallet will automatically close. When the electronic money is pulled into the wallet, a voice will appear that mentions the type of electronic money. The number of electronic money provided is 15 referring to the commonly used electronic money. Electronic Money Menu. Children are asked to put a

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	certain amount of electronic money into the wallet provided. The wallet will open automatically if the electronic money is to be entered, and vice versa, if the electronic money has already been put in the wallet, then the wallet will automatically close. When the electronic money is pulled into the wallet, a voice will appear that mentions the type of electronic money. The number of electronic dollars provided is 15, referring to the commonly used electronic dollars.
	Finished Entering Electronic Money. If the child has finished putting in all the electronic money, then there will be a congratulatory display.
	Value for Money menu. In this section, the child recognizes the value of money. The nominal amount presented is limited to Rp100 to Rp20,000. Nominal paper money is Rp2,000, Rp5,000, Rp10,000, and Rp20,000, while nominal coins are Rp100, Rp200, Rp500, and Rp1,000. The child is given the freedom to choose one preferred image.
	Payment menu. The child is asked to hand over the money to the cashier in accordance with the nominal amount requested. On the screen, the child is given two choices.
	If the child gives money with the correct nominal, then there will be a green checkmark.
	If the child gives money with an incorrect nominal, a red cross will appear.
	Menu Items that have been selected. If the child has made a payment, then the image of the selected item will be marked with a green checklist. The child will be asked to select the item again until all the items are checked green and the game ends.
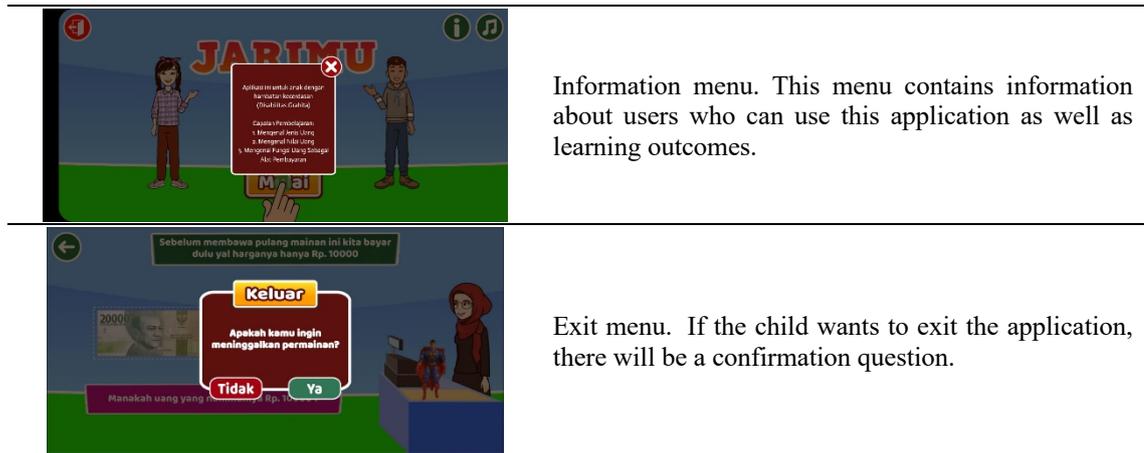
Information menu. This menu contains information about users who can use this application as well as learning outcomes.

Exit menu. If the child wants to exit the application, there will be a confirmation question.

3. System Test

This test involved 1 lecturer, 1 SLB principal, 14 SLB teachers, 2 learning technology developers, 1 parent, and 1 person with an intellectual disability. Testing of this application is carried out in a blended manner (online and offline). The online implementation was carried out by sending application links and questionnaire links to respondents in the West Java, DKI Jakarta, East Java, Banten, D.I. Yogyakarta, and Bengkulu regions, while the offline implementation was carried out at the Depok City Special School.

a. Trial on Android This application is converted into an Android application using Construct 3 software. The test results went well, and the minimum specification requirement uses Android 6.0+ (Marshmallow) with a minimum smartphone memory capacity of 512 MB.

b. Black Box Test According to Astuti (2018), BlackBox is a test that observes the results of test data and the function of an application. Here are the research results of the JARIMU application with BlackBox.

Table 6. Blackbox Test

No.	Tested	Input	Output	Satus
1.	Start button	Click the start button.	Display the main menu layout.	Valid
2.	The i button	Click the i button.	Display layout information	Valid
3.	Money Type button	Click the money type button.	Displays three types of money (paper, coin, and electronic).	Valid
4.	Banknote Button	Click the banknote button.	Features paper money and wallets	Valid
5.	Coin Money Button	Click the coin button.	Displaying coins and jars	Valid
6.	Electronic Money Button,	Click the electronic money button,	Displaying electronic money	Valid
7.	Advanced button	Click the advanced button.	Showcasing the next game	Valid
8.	Done button	Click finish	The game stops and displays a choice of continuing or exiting.	Valid
9.	Value for money button	Click value for money	Display items at existing prices.	Valid
10.	Song tone symbol button	Click the song tone symbol.	Music backsound stops or sounds	Valid
11.	Arrow keys	Click the arrow.	The question arises of confirmation, no, and yes.	Valid
12.	Money image button	Click the money image	A green checkmark appears if	Valid

No.	Tested	Input	Output	Satus
		option.	the answer is correct.	
13.	Money image button	Click the money image option.	A red cross appears if the answer is wrong.	Valid

Based on the BlackBox test, the result is that the JARIMU application is valid.

4. Test questionnaire

The level of user satisfaction was tested using user acceptance testing (UAT) involving 19 respondents, including 1 lecturer, 1 SLB principal, 14 SLB teachers, 2 learning technology developers, and 1 parent. Each respondent answered 11 questions with a choice of answer criteria and scored as follows:

Table 7. Recap of Respondents' Answer Count

Q	Number of Answers					Number of Scores	Percentage
	SS	S	N	TS	STS		
1	6	13				82	86%
2	9	10				85	89%
3	6	13				82	86%
4	6	13				82	86%
5	5	13	1			80	84%
6	7	12				83	87%
7	5	13	1			80	84%
8	4	15				80	84%
9	7	12				83	87%
10	7	11		1		81	85%
11	5	14				81	85%
Average percentage							86,029%

Information on table 8 was obtained based on the table.

Table 8. Percentage of Questionnaire Results

Q	Question	Percentage
1	Attractive app display	86%
2	Menus and buttons in the app are easy to understand.	89%
3	easy-to-play app	86%
4	Apps can help students get to know a wide variety of	86%
5	Children's enthusiasm when learning with this application increases.	84%
6	The content of the learning material can be easily understood by children.	87%
7	The app helps you get to know a wide variety of currencies in an efficient and fun way.	84%
8	The existing menu already meets the needs of children.	84%
9	This media app has excellent audio clarity.	87%
10	Color the application according to the characteristics of the child.	85%
11	The composition of the application should be according to the character of the child.	85%
Average percentage		86,029%

The average percentage of the JARIMU application obtained a result of 86.029%, which means that this application is very feasible to use to help children with intelligence (intellectual) barriers in self-development life skills competencies aspects of knowing money.

CONCLUSSION

Based on the research that has been done, it can be concluded that the subject experienced obstacles in other aspects of life skills. Many aspects are included in other life skills, but the top priority is the skill of using money. The skill of using money needs to be learned at school or at home, but unfortunately, teachers or parents have difficulties. It turned out that the use of real money did not attract the attention of children with intellectual disabilities because it seemed meaningless, and they made the real money just toys. Therefore, researchers developed an Android-based learning medium that can help intellectually disabled people develop money-knowledge skills. The learning medium is named JARIMU. This application has been validated and has a user acceptance percentage of 86.029%.

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