Development of Digital Pocket Book-Based Motion Literacy

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Abstract. This study aims to develop a pocketbook-based motion literacy model for students. The research subjects were 60 elementary school students who became users of the product being developed. The model used in this research is the Borg and Ghall development model which consists of 10 steps. However, in this study, only the Expert Judgment stage was passed. The research was conducted in May 2023-July 2023 at the State Elementary School in Medan Tembung District. The instrument used is a questionnaire. Data analysis using percentage technique.The results of the study developed 25 motion literacy models. Based on the results of media expert assessment, the product developed, seen from Basic Principles of Graphics 90%, Color 87.5%, Writing 92.9%, Navigation 91.7%, Illustrations and Supporting Media 92.9%, Attractiveness 83.3 %, and Content Design 87.5%. Material experts rate the product being developed at 92.5%, which means very good. Based on the research data above, it can be concluded that conceptually the digital pocketbook-based motion literacy model is very feasible.

Keyword : movement literacy, digital books, basic movement

1. Introduction

Technology is a fundamental and inseparable element of present-day human existence, and its ongoing evolution will be driven by the exigencies of human life in the future. It is evident that contemporary society relies heavily on technology, as it has become indispensable for human beings to access knowledge through diverse technological means (Fanzeka et al., 2021). Nevertheless, it is important to acknowledge that technology, encompassing gadgets, android devices, and telephones, offers numerous advantages. However, it is crucial to address the regular and effective utilization of these technological tools to prevent potential harm to individuals, particularly children. Based on prior research findings concerning the potential hazards associated with excessive use of electronic devices, it has been observed that prolonged and uninterrupted engagement with Android devices, beyond a duration of two hours, might adversely affect the overall growth and development, physical well-being, cognitive abilities, language acquisition, health, and social psychology of children. It is important to acknowledge that the period of childhood, specifically between the ages of 6 and 12, is a critical and delicate phase in the overall development of a child. During this period, there was a significant advancement known as the emergence of emotional and spiritual

intelligence, intellectual intelligence, physical well-being, and social growth. If individuals are able to offer appropriate support to the child, it is likely that the youngster will experience growth and development leading to maturity (Purvis et al., 2020).

The excessive use of electronic devices as toys by our nieces and nephews has surpassed the boundaries of rationality, given the favourable circumstances prevailing in our immediate surroundings. Therefore, it may be argued that electronic devices have become an essential requirement for these children. This implies that in the absence of gadgets, the child's emotional state may not attain a state of calmness. In October 2022, a group of researchers collaborated with students studying sports science to perform observations on a sample of 50 individuals who were parents of children between the ages of 6 and 12. The objective of this observation is to capture photographs of children utilizing Android devices. The sources of data in the observation consist of the child's parents and their child. The findings of the study indicate that among school-aged youngsters, a little 5% exhibit passive engagement with gadgets or Android devices, whilst a significant majority of 95% demonstrate high levels of activity. In terms of physical attributes, it was observed that 85% of the student population had a higher body fat percentage. Additionally, observations indicated that 93% of kids displayed slow and lethargic movements, while 88% showed sluggishness in their cognitive thinking abilities, including a subset of youngsters who exhibited delayed reasoning skills. Based on the findings of this observational study, it can be inferred that the observed youngsters may be experiencing adverse circumstances, highlighting the urgency to address this issue for the sake of future generations. When examining the factors that contribute to children's active engagement with gadgets due to a sense of freedom, it is evident that many parents do not impose restrictions on their children's use of gadgets or Android devices. In practice, numerous parents willingly provide their children with gadgets as a means of pacifying them, without considering the potential adverse consequences associated with such devices. Another factor contributing to children's increased engagement with gadgets is the limited availability of positive activities, such as sports, training, and tutoring, due to a lack of guidance. Additionally, the absence of rules during online interactions fosters a sense of addiction and enjoyment among children in their engagement with internet access (Simanjuntak et al., 2021).

The teachers at each educational institution have indeed offered support and guidance regarding the excessive use of electronic devices, particularly gadgets and androids. However, due to the absence of direct supervision, the students tend to disregard the advice provided by their teachers. Children have a preference for engaging with electronic devices, such as gadgets and androids, within the boundaries of their parents' house. Extended exposure to gadgets and android devices has been found to have a detrimental impact on the physical, motor skills, and psychological well-being of youngsters, leading to a decline in their overall quality of life. According to Pedaste et al. (2023), the utilization of gadgets/androids has both advantages and disadvantages. Khaulani et al. (2020) elaborate on the potential benefits and dangers associated with excessive gadget/android usage. One concerning aspect is the emission of radiation near the user's head when the gadget/android is in operation, as highlighted by Kurniasih (2021). This condition refers to a situation in which the individual's head is subjected to a significant amount of electromagnetic waves and radiation. The overutilization of electronic devices will adversely affect the social and emotional development of youngsters. The utilization of electronic devices among youngsters has been associated with several adverse consequences, such as the development of introverted tendencies, disruptions in sleep patterns, diminished

physical strength, increased isolation, heightened aggression, diminished creative abilities, and susceptibility to cyber bullying. Hence, given that a child's educational experience encompasses both the school environment and the home setting, it is imperative for parents and teachers to engage in collaborative efforts to effectively address this matter. The involvement of parents as educators is crucial in overseeing and regulating children's usage of electronic devices, ensuring that they adhere to designated time limits. Additionally, teachers, particularly those specializing in Sports and Physical Education (PJOK) and health, should develop interactive educational programs aimed at pre-emptively addressing children's potential addiction to gadgets and Android devices.

In light of this issue, researchers are motivated to assist physical education teachers in addressing the problem of students' potential addiction to gadgets and improper use of Android devices. Additionally, their aim is to promote the restoration of children's physical well-being who have already been impacted by excessive gadget and android usage. There is a current endeavour to promote the development of children's physical literacy, aiming to nurture positive attitudes, enthusiasm, and habits toward movement. The ultimate goal is to establish a mindset where physical activity becomes an essential component of students' lives, resulting in the formation of healthy, physically fit, and skilful individuals. The central focus of this concept centers upon the advancement of a digital pocketbook that utilizes motion literacy as a foundation for elementary school students. The digital pocketbook encompasses interactive motion elements tailored to the specific qualities of students. The digital pocketbook enables students to conveniently access it from many devices such as laptops and Android phones, allowing for flexibility in usage. This accessibility allows students to examine the content and select the most suitable form of movement for their specific context, enabling them to engage in alone or team-based practice sessions.

2. Literature

The development of movement skills in children commences with the engagement in fundamental motion activities (Sari et al., 2019). The understanding and mastery of fundamental motion principles are crucial for the development of proper movement mechanics. Hence, it is imperative to acquire proficiency in basic movement abilities from a young age. In order to appropriately choose activities for the physical development of infants and identify efficacious basic movement concepts, it is imperative to possess a comprehensive understanding of fundamental movement principles in early infancy (Rejeki et al., 2022). The fundamental movement capabilities can be classified into three distinct categories, specifically locomotors, non-locomotors, and manipulating. Locomotors abilities encompass the capacity to transport the body from one location to another, as well as the ability to elevate the body, as exemplified by actions like jumping and leaping. Additional locomotive capabilities encompass ambulation, sprinting, skipping, leaping, gliding, and emulating the gait of a cantering equine. Non-locomotors abilities refer to movements that are executed in a stationary position when there is little space available for physical movement. Non-locomotors talents encompass a range of movements, including bending and stretching, pushing and pulling, lifting and lowering, folding and twisting, shuffling, circular motions, bouncing, and various more. The child's manipulative talents are cultivated as they acquire proficiency in handling diverse things. The utilization of manipulative abilities encompasses the engagement of several

appendages, including hands and feet, although additional bodily components may also be employed.

According to the Big Indonesian Dictionary (KBBI) from 2008, a pocketbook is defined as a compact literary work that is designed to fit into a pocket and may be conveniently carried and stored in various locations. According to Meikahani and Kriswanto (2015), pocketbooks are compact literary works that incorporate written content and visual elements in the form of explanatory materials. These books serve the purpose of guiding and disseminating information, instructions, and knowledge, while also offering the convenience of portability. According to Melyanti (2014), a pocketbook can be defined as a compact and lightweight book that is conveniently portable, allowing for easy access and reading at any given moment. In accordance with the findings of E. Kososih (2021), a pocketbook can be defined as a small literary publication. Pocket books can serve as a valuable resource for instructional materials, facilitating the learning process for students.

As stated by Ardiansyah and Rakhmawati (2013), a pocket book refers to a compact literary work that is designed to fit within a pocket, enabling convenient portability and unrestricted accessibility without the need for any other medium. Based on the aforementioned definitions provided by the experts, it can be inferred that a pocketbook is a compact literary work characterized by its diminutive dimensions, facilitating convenient storage within a pocket or small bag, hence enabling effortless portability and unrestricted accessibility at any given time and location. Pocket books possess both advantages and cons. According to Sulistyowati (2019), pocketbooks offer several advantages. Firstly, their practicality and compact size make them easy to carry anywhere. Additionally, their attractive design, which often includes a combination of engaging writing and visuals, can effectively stimulate student motivation. Furthermore, pocketbooks enable both teachers and students to revisit and review teaching material together. In terms of limitations, pocketbooks necessitate elongated printing processes and incur higher costs, while their compact dimensions render them susceptible to being misplaced.

According to the Big Indonesian Dictionary (KBBI, 2016), a pocketbook is defined as a compact literary publication that is designed to fit within a pocket and may be conveniently carried and stored in various locations. According to Pedaste et al. (2023), pocketbooks are compact literary works that incorporate textual content and visual illustrations in the form of explanatory materials, serving the purpose of offering guidance, disseminating information, imparting instructions, and facilitating knowledge acquisition. Moreover, their portable nature enables convenient transportation and accessibility in many settings. According to Lin et al. (2017), a pocket book can be defined as a compact and lightweight publication that is conveniently portable, allowing for easy access and reading at any given moment. In accordance with the findings of Meikalhalni and Kriswalnto (2015), a pocketbook can be defined as a compact-sized publication. Pocket books serve as a valuable resource for instructional resources, facilitating the learning process for students. According to Hafizhasando et al. (2021), a pocket book refers to a compact literary work that is designed to be conveniently carried in one's pocket and readily accessible without the need for any electronic or digital medium. Based on the aforementioned definitions provided by the experts, it can be inferred that a pocketbook is a compact publication characterized by its small dimensions, facilitating convenient storage within a pocket or small bag, hence enabling effortless portability and unrestricted accessibility at any given time and location. Pocket books

possess both advantages and cons. According to Ariyanto et al. (2022), pocketbooks offer several advantages. One notable advantage is their practicality, as they are conveniently sized and can be easily carried anywhere. Additionally, their attractive design, which often includes a combination of engaging writing and visuals, has the potential to stimulate student motivation. Moreover, pocketbooks enable teachers and students to revisit and review teaching materials collaboratively. One downside of pocketbooks is their requirement for lengthy printing processes, which can result in higher production costs. Additionally, their compact size renders them more susceptible to being misplaced or lost.

The concept of literacy can be understood through multiple perspectives. For instance, in Alberta, literacy is defined as the capacity to comprehend written text, compose written content, acquire knowledge and competencies, engage in critical thinking to solve problems, and effectively communicate ideas. This multifaceted understanding of literacy enables individuals to cultivate their potential and actively participate in community affairs (Djuanda, 2017). In the study conducted by C.F. (1994), it was shown that literacy encompasses the linguistic competence of individuals in several modes of communication, including reading, speaking, listening, and writing, which are adapted to suit their specific objectives. The aforementioned definition provides a concise explanation of literacy, specifically referring to the capacity to both read and write. According to UNESCO, the United Nations Educational, Scientific and Cultural Organization, literacy encompasses a range of tangible abilities, particularly those pertaining to reading and writing, irrespective of the specific circumstances under which these proficiencies were acquired. According to the Education Development Center (EDC), literacy encompasses more than mere reading and writing proficiency. Moreover, literacy encompasses an individual's capacity to effectively utilize their full range of potential and abilities throughout their life. According to Wiedarti (2018), it is important to recognize that literacy encompasses both the capacity to comprehend written language and the capacity to interpret and grasp the broader context of the world.

3. Method

The methodology applied in this developmental research study is a mixed methods approach, which integrates both qualitative and quantitative research methodologies. The purpose of this endeavour is to achieve the capability to access and analyze all available data or information in order to obtain a thorough and full explanation. The employed research methodology is the research and development (R&D) approach, specifically the Borg and Gall development model, which encompasses a series of ten distinct development processes. This report presents the findings of the expert assessment. The present study was carried out within the elementary schools located in the Medan Tembung District of Medan, North Sumatra. Given the nature of this study's focus on learning, the execution of this research has been tailored to align with the established learning timetable. The data collection methods employed in this developmental research encompassed the utilization of questionnaires, documentation analysis, and interviews. The research data presented encompasses both qualitative and quantitative data. Qualitative data refers to information that is expressed in descriptive form, typically in the form of sentences rather than numerical values. Quantitative data is acquired by the assignment of scores, which are subsequently converted into percentages.

4. Results and Discussion

The present study is a developmental research endeavor that incorporates a combination of qualitative and quantitative data sources, including many stages including needs analysis, planning, initial product design, expert judgment, small-scale product testing, large-scale product testing, and product efficacy testing.

1. Analysis of Needs. During this phase, the researcher conducted observations of students in educational institutions with the objective of gathering empirical data regarding the students' circumstances in relation to the challenges they encountered. The present study is based on the findings derived from observations conducted on a sample of 50 individuals who are part of familial units and have children between the ages of 6 and 12 years. The objective of this observation is to capture photographs of children utilizing Android devices. The data sources included in the observation consist of the child's parents and the child. The findings of this observation are delineated in the graphical representation provided.
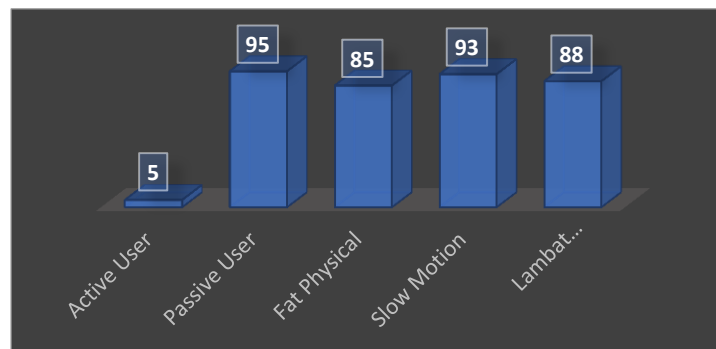

Fig 1. Graph of Student Condition Profile

The provided graph depicts the observed condition of school children, indicating that among the 50 children seen, a mere 5% exhibited passive behavior in their utilization of gadgets or android devices, while the remaining 95% shown a high level of activity. In terms of physical observations, it is noted that 85% of the student population exhibits a higher body fat percentage. Additionally, observations indicate that 93% of students display slow and lethargic movements, while 88% exhibit a slower pace in their cognitive reasoning abilities, including children who demonstrate delayed reasoning skills. Based on the findings of this observation, it may be inferred that the observed children may be experiencing unfavorable circumstances. Consequently, it is imperative to solve this issue in order to safeguard the well-being of future generations. When considering the factors that contribute to children's active engagement with gadgets due to a sense of freedom, it is evident that parents often fail to impose restrictions on their children's use of gadgets and android devices. In practice, numerous parents willingly provide their children with gadgets without any consideration for the potential adverse consequences associated with such devices. One contributing factor to children's increased engagement with gadgets is the limited availability of positive activities, such as sports, training, and tutoring, which lack proper guidance. Additionally, the absence of rules governing interactions in cyberspace fosters a sense of addiction and enjoyment among children.

2. Planning. The planning conducted in this study is a preliminary procedure associated with the requirement for product development (a mobile literacy model centered on digital pocketbooks) for elementary school students. This encompasses all research activities,

ranging from identifying user preferences to the development, testing, and evaluation of the product's efficacy. In order to achieve this objective, a comprehensive strategy is prepared to facilitate the smooth execution of development operations and mitigate the potential occurrence of various barriers. The strategy encompassed various key elements, including financial resources, human resources, time allocation, credentials of the research team, and their active involvement in the project. The primary financial resources utilized in this study consist of research grants obtained from PNBP Universitas Negeri Medan. Funds are needed for:

a) Designing a motion literacy model
b) The design of the digital pocket book
c) Equipment,
d) Service fees of validator experts,
e) Experts and teams
f) For transportation costs,
g) and logistics of product trial activities.

Research and development activities are carried out in stages; the first stage is model making/development, expert testing, small group scale product trials, large group scale product trials and testing the effectiveness of the five stages are carried out continuously within 1 year to produce digital book-based motion literacy model products for elementary school children.

3. Product Design. The present study has resulted in the creation of a digital-based fundamental motion literacy model designed specifically for primary school kids. The development of this product was rooted in the fundamental concept of enhancing physical education instruction for elementary school children. The acquisition of knowledge, skills, aesthetic development, social interaction, and self-confidence can be facilitated via engagement in a diverse range of physical and sporting activities. These activities may be pursued individually or in a collective setting, fostering a sense of happiness and joy. This approach contributes to the efficient attainment of physical fitness. Drawing from this fundamental concept, the developer establishes nine distinct models of elementary school children's basic movement literacy. These models encompass the following: Literacy in walking straight ahead, Literacy in walking gracefully, Literacy in walking with tires, Literacy in zigzag movement, Literacy in executing covert paper movements, Literacy in ball hunting movements, Literacy in donut-shaped movements, Literacy in footbridge movements, and Literacy in ball crushing movements.

The acquisition of fundamental movement skills can be readily achieved through self-directed practice as well as under the instruction of an instructor. The aforementioned model is thereafter encapsulated within a digital pocketbook, which can be accessed and utilized by elementary school children using their Android mobile devices for the purpose of seeing and studying. The subsequent procedures outline the process of presenting a fundamental motion literacy model that has been encapsulated in the format of a digital pocketbook.

Fig 2. Mobile Literacy Pocket Book

a) Download the Pocket Book Application so that it appears on the Android cellphone screen
b) After the application appears on the Android mobile screen, then the application is 'clicked' to enter the application's front page.
c) After the cover appears, then 'click' to enter the application instructions section. These instructions are used as information on the use of the application. The following shows the application instructions.
d) To display the contents of the aplication click 'menu'. On the menu there are introductions, instructions, basic motion literacy models, assessments, and a bibliography. Here's the menu display
e) To open the contents of the menu, click on the basic motion literacy model. Here's how it looks.

The development of this digital pocket book was undertaken with the intention of aligning it with the psychological features associated with pupil learning. The development of writing styles, illustrations, auditory elements, and designs in pocket books is tailored to align with the specific features of students. Once the product has been designed, it is imperative to subject it to rigorous testing by professionals. This ensures that the developed product possesses a robust scientific foundation, both in terms of its conceptual framework and practical implementation. The outcomes of the expert assessment conducted on the product drafts, namely interactive instructional materials, have been obtained. The evaluation of the product draft under development involves three specialists, specifically two media experts and one material expert. The responsibility of the specialists is to assess the viability of the product proposal, specifically in terms of its functional capacity to accomplish the stated objectives. As previously elucidated, the objective of building a digital-centric motion literacy model is to aid students in their personal growth by enabling them to utilize their time efficiently. Specifically, this entails engaging in consistent and impactful play-based physical activities to enhance their motor skills. The comprehensive expert validation method involved the utilization of a previously validated questionnaire, as well as the conduct of interviews, to collect data. The following are the results of the media expert's validation drawn through the following graph:
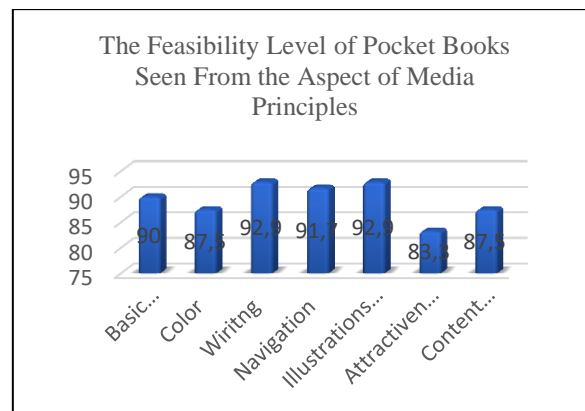
Fig 3. Results of Expert Evaluation of Developed Product Drafts

The table above is the result of data analysis from a questionnaire filled out by experts. Media experts view product eligibility from seven aspects, namely; Basic Principles of Graphics, Colour, Writing, Navigation, Illustrations and Supporting Media, Attractiveness, and Content Design Based on the findings of the investigation, the table above reveals that media professionals have evaluated the product's graphics element based on the fundamental criteria, with 90% falling inside the category of "very good." In terms of the feature of coloration, specialists in the field provided an evaluation of 87.5%, placing it within the category of good. In terms of the writing component, media specialists provided an evaluation of 92.9%, indicating a high level of proficiency. In terms of navigation, the media expert provided an evaluation of 91.7%, placing it inside the "good" category. The evaluation provided by media specialists for the aspects of illustrations and supporting media is 92.9%, indicating a high level of quality. In addition, with regard to the feature of attractiveness, media professionals provided an evaluation of 83.3%, indicating a favourable rating. In terms of content design, media specialists have provided an evaluation of 87.5%, indicating a favourable rating. The media expert's evaluation of the many components of the product's feasibility indicates that it is generally favourable. Therefore, with regard to the calibre of the media components, the generated product exhibits conceptual viability for utilization and further experimentation. The product under development is subjected to analysis by specialists in materials to see whether the content of the motion literacy model aligns with the principles of learning, the principles of the user's physical and psychological development, and the principles of motion.

According to the evaluation conducted by Expert 1, the assessment of the created product draft was determined to be 90% in the highly viable category. Similarly, Expert 2 provided an evaluation of the product draft, rating it at 92.5% in the highly viable category. The ongoing development of the product prototype, when examined from a material perspective, appears to be viable for further empirical testing aimed at assessing the usability of the product for end-users. Nevertheless, according to the opinions of the experts, the product prototype devised in this research endeavour was deemed viable. However, the experts further contributed by providing enhancements and recommendations to enhance the efficiency and efficacy of the product. There are 3 suggestions from media experts:

1) The cover or opening page of the pocket book, media experts suggest that the cover of the pocket book should be designed with pictures that are related to the topic of the pocket book. The design of the colour of the writing needs to be adjusted to the characteristics of

the user, because the existing writing is too dark and the words are arranged more easily to be understood.

2) Media experts also suggest that each subtitle in the pocket book should be displayed separately from its contents. So that users are more interesting and more motivated in using it.

3) Image displays are displayed in stages to make it more attractive and provide curiosity for the user. Positive curiosity is the beginning of growing user curiosity. In learning the growth of curiosity is the basic capital to acquire knowledge for students.

5. Conclusion

Based on the results of the analysis of media experts and material experts on the motion literacy pocket book for elementary school students developed in the study, it is feasible to look at it from the elements of the media and its contents. Thus the mobile literacy pocket book will be continued by researchers for small-scale and large-scale field trials.

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