



Development of PPT Technology-Based Teaching Materials (Interactive Quizzes) to Improve Numerical Skills in Down Syndrome Children at SLB C Autism Kedungkandang

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Abstract

This study aims to develop PowerPoint (PPT) technology-based teaching materials with interactive quizzes to improve numerical skills in Down Syndrome children at SLB C Autism Kedungkandang. The method used is a case study with a 4D development approach, namely Define, Design, and Development. The results of observations and interviews indicate that students have difficulty in understanding numerical concepts. The teaching materials developed include multimedia elements such as videos and interactive quizzes, which are designed to attract students' interest and facilitate understanding of the material. Validation from experts shows that these teaching materials are feasible to use and are appropriate to students' needs. This study concludes that the use of technology-based teaching materials can improve the motivation and numerical skills of Down Syndrome students, and provides recommendations for further development in inclusive education.

Keywords: PowerPoint, interactive quizzes, numerical skills

1. Introduction

In carrying out learning, a teacher requires teaching materials to facilitate teachers and students in achieving learning objectives. Teaching materials are all forms of materials used to assist the teaching and learning process. Teaching materials serve as a guide for teachers in the learning process. Teaching materials can be interpreted as materials or lesson materials that are arranged completely and systematically based on the learning principles used by teachers and students in the learning process. (Magdalena et al., 2020). Meanwhile, according to the National Center for Competency Based Training 2007 (Nuryasana & Desiningrum, 2020), teaching materials are all forms of

materials used to assist teachers. Translated from Indonesian to English - www.onlinedoctranslator.com in carrying out the learning process. Thus, teaching materials are all forms of learning materials and materials that are arranged systematically to help make it easier for teachers and students in the teaching and learning process so that a comfortable learning atmosphere can be created and learning objectives can be achieved.

Technology-based teaching materials can increase students' motivation in learning. One of them is teaching materials based on multimedia media, PowerPoint. PowerPoint is one of the software used to compile presentation materials. PowerPoint is an alternative in becoming an interactive learning media as an effort to actively involve students in the learning process and increase student motivation in learning. According to Grzeszczyk, 2016 (Rhiyanto & Rachmadiarti, 2023), Microsoft PowerPoint allows interaction and creates activities such as interactive games or quizzes. Not only interactive quizzes containing questions related to learning materials, but there are also animated videos related to interesting learning materials that are expected to foster students' interest in understanding the learning materials. The information presented is not only seen through print, but can be heard, seen, and operated. As stated by (Setiawan & Swaditya, 2018), Users are able to interact using the multimedia, for example, determining which dishes to open and can work on test questions through the media. The information displayed can not only be seen through print, but can also be heard, building simulations & animations that can arouse interest & have high graphic artistic value in their presentation.

In this study, the teaching materials compiled are mathematics subjects as an effort to improve numerical abilities through PPT technology-based teaching materials using interactive quizzes. Mathematics is one of the fields of study that must be studied at every level of education. Mathematics plays an important role in education. Numerical ability is one of the abilities that must be mastered in mathematics learning. Numerical ability is the ability to understand numbers, count, and solve problems related to numbers. Numerical ability is the ability possessed by a person to use and process numbers by first changing the problem from the form of a story description into the form of mathematical numbers so that mathematical calculations can be carried out

(Sasanguie, Smedt, Defever, & Reymoet, 2012: 353; Olatoye & Aderogba, 2011: 432) (Riani et al., 2022). According to Astuti et al. (Irawan, 2016:123), numerical ability is a skill related to accuracy and speed in using basic arithmetic functions. This ability is important to master because it is the basis for mathematical operations (Rezawatimar et al., 2018). Numerical ability can be interpreted as the ability to recognize, use and process numbers and use basic arithmetic functions.

Therefore, based on the results of observations and interviews that have been conducted at SLB C Autism State Kedungkandang in Class IX SMPLB on downsyndrome students who show difficulties in numerical abilities, PPT technology-based teaching materials with interactive quizzes were created. Numerical abilities are basic abilities that students must have, because if Students who have low numerical abilities will experience difficulties in learning mathematics. Therefore, with the existence of interactive quizzes based on PowerPoint, it is hoped that it can improve the abilities of students with Down syndrome in numerical abilities.

2. Method

In this article research, a field case study was first conducted at SLB C Autism State Kedungkandang, class IX SMPLB Malang City by conducting interviews and observations at the school. This article was created using the 4D development approach taken from 4 stages, namely Define, Design, Development and Disseminate. The development procedures in this study are the Define stage, which is the stage to formulate requirements in learning. At this stage the researcher will collect various information about students or problems related to teaching materials that become obstacles, determine the teaching materials needed in the development of teaching materials, and provide efficient solutions in learning. The Design stage, which is the stage to design the resulting product that has been designed according to the define analysis both in terms of selecting Interactive PPT teaching material media, format, and color selection according to the wishes of students. The Development stage, which is the stage to realize the product design that has been designed, then validated by experts, then

tested on students on a limited basis. In addition, at this stage there are also revisions from various experts in their fields according to suggestions and input. The Dissemination Stage, which is the product distribution stage, aims to disseminate the product after it has been developed by researchers (Fitriyah & Ghofur, 2021). In this research, the development stages of the interactive PPT teaching material product only reached the Development stage. Therefore, this development was modified to only 3D, Define, Design, and Development.

3. Results and Discussion

Result

Based on the results of interviews and observations that have been conducted at SLB C Autism State Kedungkandang which were carried out in class IX of SMPLB level, it shows that there are Down Syndrome students who still have difficulty in learning mathematics in their numerical abilities. Numerical ability is the ability to work in numbers to understand concepts related to numbers (numerical). (Lestari, 2019) therefore the acquisition of learning to recognize numbers or numeracy in children with Down Syndrome obstacles has not been carried out well in these students. At the time of observations conducted at SLB C Autism State Kedungkandang, students with Down Syndrome obstacles during learning and giving math problems require special assistance by the teacher, because students do not yet know numbers, but students can already carry out instructions given by the teacher, the questions given to the child are different from the others, because they adjust to the abilities of each student.

The learning provided by the teacher in class uses lecture and differentiation methods. At the beginning of the lesson the teacher will explain or describe the material. will be discussed at the meeting, in class IX SLB C Autism State Kedungkandang there are 4 characteristics of students namely mild, moderate, severe mental retardation and Down Syndrome, for students such as mild mental retardation can follow the learning given by the teacher at the meeting namely addition and storing in layers, after the

teacher has finished giving the learning material, then the students one by one who are able to follow the learning come forward to answer the questions given by the teacher. Of course, each obstacle or characteristic of the question is given varied or different according to the abilities of the child. However, for Down Syndrome students do not come forward because they still have to adjust the learning, after answering the questions on the board, the teacher gives technology-based assignments such as math games on the students' smartphones. For mild mental retardation students can follow it well. However, for Down Syndrome students, they need assistance from the teacher to apply technology on laptops.

Therefore, this study designed interactive PPT-based teaching materials for children with Down Syndrome, to make learning easier and more varied, with interesting images, learning song videos that can be followed and also several quizzes that can be tried by children with Down Syndrome. Therefore, to strive for learning that is expected to be more effective and make it easier for Down Syndrome students in their learning, interactive PPT-based teaching materials were created which contain videos to recognize numbers as well as several quizzes that can be tried out by these students to make it easier to recognize numbers.

VALIDATION RESULTS

Based on the data analysis that has been done, the validation results of Technology-based Teaching Materials (Interactive Quizzes) using PPT that has been validated by the lecturer and also obtained from validation by students. The aspects assessed are divided into two, namely the construction aspect and the material aspect. In the construction aspect, there are several assessment points including; 1) The order of discussion in this book is very logical and easy to follow. 2) The introductory chapter provides a clear overview of the entire contents of the book. 3) The flow of discussion between chapters is well connected and forms a complete unit. 4) The language used in this book is very clear, easy to understand, and in accordance with good and correct language rules. 5) The writing style used is consistent and interesting throughout the book. 6) The illustrations and tables used are very relevant and support the explanations

in the text. 7) The examples and cases given are very concrete and help readers understand the concept. 8) The titles and subtitles used are very interesting and reflect the contents of each section. 9) This book provides significant added value for readers in the field of Mathematics. 10) This book successfully conveys information clearly and systematically. 11) This book is a good reference source for [reader group]. Based on the results of the filling data, the total points for the score (strongly agree) are more than 30 points, more precisely 38 points, for the score (agree) more than 40 points, more precisely 43 points, for the score (neutral) the total points are less than 10 points, more precisely 9 points, while for the score (less agree and disagree) the total points are 0. The percentage obtained from the validation results on the construction aspect is 42% for the score (strongly agree), 48% for the score (agree), and 10% for the score (neutral).

In the material aspect, there are several similar assessments in the material aspect, namely 1) Material Truth: All facts, data, and information presented in the book have been verified from credible and accountable sources. 2) Relevance to the Title and Subtitle: Each section in the book directly supports the title and subtitle that have been set. 3) Depth of Material: The material presented is quite in-depth and comprehensive, and provides a thorough understanding of the topic. 4) Actuality: The information presented is still relevant to the latest developments in the related field. 5) Completeness of Material: All important aspects of the topic discussed have been discussed thoroughly. 6) Uniqueness of Perspective: The book offers a new point of view or perspective that is different from similar books. 7) Concept Clarity: Complex concepts are explained in simple and easy-to-understand language. 8) Relevance to Target Readers: The book's material is in accordance with the needs and level of understanding of the target readers. 9) Interrelationships Between Chapters: Each chapter is interrelated and forms a complete unit. 10) Added Value: The book provides significant benefits to readers, both in terms of knowledge, skills, or insights. So based on the data on the assessment of the total points on the score (strongly agree) is more than 20 points, exactly 26 points, on the score (agree) obtained points of more than 40, which more precisely reached 49 points, on the score (neutral) obtained less than 10 points, more precisely reached 6 points, while on the score (less agree and disagree), obtained a total of 0 points. The percentage obtained from the validation results on the material aspect is 32% on the score (strongly agree), 60% on the score (agree), and 7% on the score (neutral).

From the validation results on the construction and material aspects, it can be concluded that the overall average assessor chose to agree, with the highest points and percentage in the score (agree), which means that this learning media (interactive quiz) is suitable for use and is in accordance with the needs and competencies of students.

4. Conclusion

The development of technology-based teaching materials, specifically using PowerPoint with interactive quizzes, has proven effective in improving numerical skills in students with Down Syndrome at SLB C Autism Kedungkandang. Through a systematic approach, this study shows that the use of interactive media can help students understand basic mathematical concepts in a more engaging and enjoyable way. Specially designed interactive quizzes provide opportunities for students to actively participate in the learning process, thereby increasing their motivation and engagement.

Validation results indicate that this teaching material is suitable for use and meets students' needs and competencies. By integrating multimedia elements such as video and animation, learning becomes more dynamic and easier to understand. Therefore, it is recommended that technology-based teaching materials be continuously developed, tailored to individual student needs. Furthermore, regular evaluations are necessary to ensure the effectiveness of the teaching materials in improving student learning outcomes, especially for those with special needs.

Recommendation

Based on the findings of this study, it is recommended that the development of technology-based teaching materials, particularly in the form of PowerPoint presentations with interactive quizzes, be continuously improved to increase student motivation and engagement in learning. The use of multimedia media

In teaching materials, such as videos, animations, and other interactive elements, they can help students understand the material more interestingly and facilitate their grasp of basic mathematical concepts, especially numerical skills. For students with special needs, such as those with Down Syndrome, teaching materials tailored to individual abilities are crucial. Therefore, teachers are advised to adapt the material and

provide special support to support students in recognizing and understanding numbers. The use of interactive PowerPoint presentations containing number recognition videos and interactive quizzes is expected to facilitate students' understanding of numerical concepts, while making learning more enjoyable and effective. Furthermore, periodic evaluation of the effectiveness of technology-based teaching materials is necessary to ensure that learning continues to be tailored to students' needs and creates an optimal learning process.

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