Development of Thematic Based Classroom Design in Inclusive Schools

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Abstract: The purpose of this study produce design guidelines based on thematic classrooms conducted in class V inclusive schools of Tisnonegaran 1 Elementary School Probolinggo. This research and development method uses Borg & Gall which has been modified to be: (1) collection of information, (2) planning, (3) product development, (4) expert validation, (5) field trials, (6) final products. The results of the development research showed that the results of the validation of learning technology experts were 97.2% and linguists were 90.6% and the readability test was 92.8%.The conclusion of thematic-based classroom design products in inclusive schools has expert validation levels and a high level of readability so that they can be used in improving the quality of learning. Suggestions for further development can use different classes and levels.

Keyword: classroom design, thematic based, inclusive school.

INTRODUCTION

The success of learning can be influenced by many things, one of which is environmental conditions. Good environmental conditions can have a positive impact on the learning process, with an attractive environment that will create an exciting learning atmosphere. The environment that is organized in a systematic, organized, and planned manner has implications for many things, including generating good responses from students (Semiawan, 2013), becoming a means to build and maintain a positive attitude (DePorter, Hernacki, & Abdurrahman, 1999), *"can supports children's exploration and active learning* (Vogel, 2012), *supports children's to independent study*, *encourage creativity, and promote collaboration"* (Wulsin, 2013).

The development of the management of the class's physical environment is based on the needs of students who consist of normal or disability. This provides therapy for children with disabilities from the existence of inclusive schools. This is supported by Borca (2010) revealing that*"powers of schools for inclusive education: perform specific therapies for children with special educational needs of special education and mass education*." Many elementary schools now become inclusive schools because people with disabilities who want to complete 12 years of compulsory education increased.This is in line with the JawaPos data (01/04/2017) "The Central Statistics Agency (BPS) of the National Labor Force Survey (Sakernas) in August 2016 shows that the disabled people have not had access to education from 10,882,923 disabled workers in Indonesia, absolute majority or 65.88 percent are elementary school graduates or equivalent ".

One portrait of structuring the physical environment of the class can be observed in Tisnonegaran I Elementary School Probolinggo. Researchers also made observations during the learning progress (09/09/16). The observation shows that the student seating arrangements look less practical, as evidenced by the fact that the desk chairs are arranged in a long line, lined up with the space in the middle less wide, so that when the learning continues, the teacher has difficulty approaching to control the work of students sitting in the middle. In addition, students find it difficult to get out or enter their seats. When the formation of groups of students seems difficult, they have to shift, lift and move the table chair too far past their friends to join the group. At that moment the female students seemed to mind when lifting the table alone, the situation resulted in noise in the classroom and disturbing other students.

When learning takes place researchers also see some students seem to have difficulty accessing learning resources because the location is on a cupboard that is high enough so students must take it by going up a chair. On Friday (9/9/16) the researcher then conducted an interview to confirm and explore information about the teacher's views on the class's physical arrangement. The results of the initial interview with the Class V teacher in Tisnonegaran I Elementary School Probolinggo showed that the teacher had not done the classroom design because they did not understand and there were no instructions on thematic-based classroom arrangement design.The results of the interview also show that the teacher's knowledge of classroom design is still limited, besides that one of the factors constraining teachers in developing classroom

design is the absence of a specific guidebook on classroom design.The researcher then interviewed the class V students about their meaning in the classroom environment. It is seen that students tend to be bored with monotonous classroom arrangement, no posters or pictures on the walls, tend to be complicated in moving and returning the bench position when in groups.

Based on the information collection above, it can be concluded that the problems that occur are: (1) the physical environment of the class has not been managed optimally, resulting in obstacles during learning, (2) the existence of student saturation, so that the desire to design a new classroom, and (3) teachers experience problems in designing classrooms because there is no specific guidebook for designing classrooms. This condition is certainly not in accordance with the objectives of the class's physical arrangement which has a vision to help create an attractive and comfortable learning environment for students.

Researchers found a solution to these problems can be done by improving the design of classrooms. Improving the design of this classroom is a real step to creating a comfortable learning environment and improving the quality of learning. This is in line with Williamson (2008) "*setting up the classroom is an important piece of the teaching process, it can determine the atmosphere in the classroom*". Structuring the physical environment of this class includes many things, including seating arrangement, furniture arrangement, space arrangement (Akbar, 2016), lighting, air conditioning or air temperature, acoustics, beauty (Karwati & Priansa, 2014), and the addition of background music (Syaifurahman & Ujiati, 2013).

Classroom design has not been widely developed in inclusive schools especially in thematic learning. previous research conducted by Byl and Kloet (2014) with the title*The Effect of The Physical Classroom Environment on Literacy Outcomes*, The research has two variables, namely the physical environment and the results of the literacy classes. The data analysis technique uses qualitative analysis. The results of these studies indicate that to support the constructivist concept of learning to read, students need to be given the opportunity to learn independently. In addition, an uncomfortable classroom environment can hinder students from learning. The relationship with current research is that there are similar research variables namely the physical environment of the class so that this research is relevant to current research.

Research by Cheryan et al. (2014) with the title*Designing Classrooms to Maximize Student Achievement*, the research has two variables, namely classroom design and student achievement. The data analysis technique uses qualitative analysis. The results of the study show that to support learning, the design of

classroom design must be considered in order to support the achievement of educational goals. In addition to improving the quality of learning, achievement, and motivation of students needed features and symbols in the classroom accompanied by training and teacher development. The relationship with current research is that there are the same research variables, namely classroom design, so that this research is relevant to current research.

Research by Lopez-Gavira et al. (2016) with the title *Proposals For The Improvement Of University Classrooms: The Perspective Of Students With Disabilities* the research has two variables, namely the improvement of class design and the perspective of students with disabilities. The data analysis technique uses biographical narrative analysis. Based on the results of the analysis it has been found that the concept of classrooms that can be used for all (education for all) includes students with disabilities such as access to all students, participatory methodology and the use of learning resources and technology. The relationship with current research is that there are similar research variables namely class design and disability so that this study is relevant to current research.

Based on the description above, the researcher feels the need and interest in conducting development research with the title "Development of Thematic Based Classroom Design in Inclusion Schools."The distinctiveness of this classroom design product is oriented to local wisdom and adapted to the themes learned by students. This development research as an alternative solution to the existing problems, as well as follow-up and complement previous research.

METHOD

The research and development methods used in developing thematic product design and design class based on the development of Borg & Gall models. This development research uses the development model Borg & Gall (1983) which has been modified to: (1) information collection, (2) planning, (3) product development, (4) expert validation, (5) field trials, (6) final product.

The procedure for research and development consists of (1) preliminary study, (2) planning, (3) product development, (4) expert validation, (5) revision of validation results, (6) field testing, (7) final product improvement, and (8) final product.

The trial design in this development was carried out through two stages, namely the expert validation stage and the field trial. Expert validation carried out by two expert validators, namely learning technology experts and linguists. After expert validation, then revisions will be made. The results of the revision were then field tested on teachers and students of Tisnonegaran 1 Elementary School in Probolinggo.

Table 1. Details of the Guidelines for Arranging Instrumentsand its function

No	Data	Komponen Data	Instrumen	Responden
1	Design Validity	**Content Validation** 1.1 Conformance class coverage of physical components designed with an overview of the design 1.2 Accuracy of design drawings in describing the arrangement and arrangement of various physical components of the class 1.3 Conformity of design with class theory and physical design principles 1.4 The accuracy of the physical design of the class with the standard facilities and infrastructure of the learning process in the inclusive school	Question-naire validation	Learning Technology Expert
		Presentation Validation 1.5 Complete description of the physical components of the class in the design 1.6 Informative icon image of the physical component of the class in the design description 1.7 Completeness of information and instructions for explanation of design description 1.8 Conformity of description to represent the space and physical components of the class in elementary school	Question-naire validation	Learning Technology Expert
		Graphic Validation 1.9 Accuracy in size, scale and layout of design drawings 1.10 The correct selection of colors and material characteristics of each component in the design 1.11 The exploration of the appearance and detail of the illustration of the class's physical design 1.12 The explication of picture quality mold design	Question-naire validation	Learning Technology Expert
2	Validity of the Guidebook	**Content Validation** 1.1 Compliance with the guide book's content and the concept of physical design theory class 1.2 Suitability of the theory and principles of design in guidebooks with the conduct standards of learning in elementary school 1.3 Accuracy of the contents of the guidebook with the procedures for setting and structuring the various physical components of the class designed 1.4 The accuracy and validity of the material presented in the guidebook	Question-naire validation	Learning Technology Expert
		Presentatio Validity 1.5 Complete illustrations and examples for the application of designs 1.6 Completeness and systematic consistency in the presentation of guidebooks 1.7 Demands of the contents of the guidebook in terms of concepts and procedures for implementing the design 1.8 Logical flow of presentation of the contents of the book as a guide in carrying out the physical design of the class	Question-naire validation	Learning Technology Expert
		Graphic Validation 1.9 Determination of font usage; type and size of letters in the guidebook 1.10 Accuracy of design settings and size of guidebook layout 1.11 attractiveness of the design of the display, illustration, drawings and photos in guidebooks 1.12 Feasibility paper quality, printing, and bookbinding	Question-naire validation	Learning Technology Expert

(Source: Researchers Processed)

Table 2 Grid of Book Trial Instruments Guide (Practitioner)

No	Data	Komponen Data	Instrumen	Re-sponden
1	Validity of the Guide-book	**Linguistic Validation Rule** 1.1 Compatibility of grammar used in the presentation of material in the guidebook 1.2 Appropriateness of use of the word and a standard term in accordance with the EYD 1.3 Effectiveness of sentence structure to represent the material presented 1.4 Accurate use of letters and punctuation	• question-naire • Intrview	Teacher
		Presentation Validation 1.5 Systematic consistency in the presentation of books in each chapter 1.6 Accuracy in the use of terms in the guidebook 1.7 Accuracy of layout and typography of text in the guidebook 1.8 Accuracy and up-to-date use of book reference sources	• question-naire • Intrview	Teacher
		Material validation sequence 1.9 Communicative use of material presentation languages 1.10 The demand forpresentation of material inaccordance with the contents of the guidebook 1.11 Logic and the interactivity of material presentation in the alloy book 1.12 Conformity to the presentation of material with the target of the reader	• question-naire • Intrview	Teacher
		Readability Validation 1.13 Ease of reading from writing, font size and space 1.14 Ease of understanding usage instructions and contents of the guidebook 1.15 Complete instructions for using the book in accordance with the contents of the guidebook 1.16 Density and attractiveness of the contents of the guidebook	• question-naire • Intrview	Teacher

Table3. Table of Criteria for Validity of Thematic Based Classroom Design

No.	Validity Criteria	Level of Effectiveness
1.	86% - 100%	Very Good (can be used without revision)
2.	70% - 85%	Good enough (can be used with revisions)
3.	60% - 69%	Not good (cannot be used)
4.	0% - 59%	Very not good

(Source: adapted from Akbar & Sriwiyana, 2011)

The trial subjects of this research and development product development are learning technology experts, learning evaluation experts, teachers and students in the Tisnonegaran 1 Elementary School class in Probolinggo.

The type of data obtained in this study is quantitative and qualitative data. Quantitative data is obtained from the results of questionnaire scores validation of material test or content and linguists, the results of teacher questionnaires and student questionnaires which are then described qualitatively. Qualitative data is obtained from the description of suggestions and comments on the improvement of the validator of learning or content technology experts, design experts, teacher and student responses.

The data collection instrument in this study is divided into two, the first data collection instrument in the introduction of information and data collectors in development research. For preliminary data collection instruments in the form of teacher and student questionnaires and teacher interview guidelines. While the data collection instruments in the development research are detailed in table 1. Table 2 is a Guidebook Trial grid (Practitioner).

There are two data analysis techniques used in this study, namely qualitative data analysis and quantitative data analysis. Qualitative data analysis is used to process data from experts and users. While the quantitative data analysis was carried out on questionnaire and test scores. Analysis of this data is intended to determine the level of achievement based on predetermined criteria. The following are the criteria in the interpretation guidelines in table 3.

Table 4. Results of Learning TechnologyValidation

No.	Criteria	Score
Compliance with the guide book's content concepts and theories of classroom design		
1.	The guidebook contains the concept of the importance of thematic-based classroom design for learning in inclusive schools.	4
2.	The guidebook contains theories from experts on specific and valid thematic-based classroom design.	4
3.	The guidebook presents adequate principles and forms of thematic-based classroom design.	4
Conformity to the contents of the guidebook with the scope of classroom design		
4.	The guidebook presents design arrangements and structuring various thematic class-based physical components.	4
5.	The guidebook is accompanied by an overview of thematic-based physical designs that are in accordance with concepts and theories.	4
6.	The guidebook covers the procedures for applying thematic-based classroom design in learning	3
Conformity of thematic-based classroom design in a guidebook with learning for inclusive schools		
7.	Thematic-based classroom design in a guidebook is suitable for designing classroom design in inclusive school learning.	4
8.	Thematic-based classroom design in guidebooks according to the characteristics of inclusive school students.	4
9.	Thematic-based classroom design in the guidebook presents the class's physical components according to the learning needs of the inclusive school.	4
	Total	**32**
	Total Percentage	**97,2%**

Figure 1. Activity of Readability Validation Process

FINDINGS AND DISCUSSION

Findings

Learning technology experts are entrusted with validating development products, namely Ms. Shofia Hattarina, M.Pd. He is an expert in the field of learning technology. In addition, he has also conducted several studies, especially in inclusive schools. The results of the product validation test showed a gain of 97.2% and the results received very valid criteria. The validation results show in table 4.

Linguists are entrusted as learning design validators namely Ms. Erfinia Deca Christiasni, M.Pd. He is a linguist. He qualifies as Master of Basic Education in Indonesian Language Concentration. The results of obtaining validation tests on student assessment tools show results of 90.6%. After being converted to the feasibility level table, the product is included in the category. The validation results show in table 5.

The subjects in this field test were the class V teachers of Tisnonegaran I Elementary School Probolinggo. Field trial data aims to determine the level of application of thematic-based classroom design products.

The level of applicability was taken from the teacher's response questionnaire. Teacher responses were collected through questionnaires given by researchers to class V teachers as users of assessment tools. The results of the teacher's response to applicability showed a score of 92.8%. After being converted to the feasibility level table, the product is included in the category of high applicability. As for the validation results show in table 6.

Table 5. Results of Language Expert Validation

No	Criteria	Score
Explication of instructions for using the guidebook		
1.	Instructions for using guidebooks use easy-to-understand language.	4
2.	Instructions for using guidebooks are arranged in clear and solid sentences.	4
3.	Instructions are included in full in accordance with the procedure for using the book	3
Ease of understanding the flow of material in the Guidebook		
4.	The guidebook is presented in communicative language.	4
5.	The guide book is presented in a coherent and systematic.	4
The accuracy of the use of terms and EYD		
6.	The guidebook uses standard words according to EYD.	4
7.	Languages used are formal and polite.	3
8.	The term language used is consistent and in accordance with the contents of the guidebook.	4
	Total	30
	Total Percentage	90,6%

Table 6. Field Validation Results

No	Criteria	Score
Ease of use guidebooks		
1.	The guidebook is easy to use by teachers (practical in terms of size and presentation of books)	4
2.	Easy guidebook	4
Completeness and explication of the contents of the guidebook		
3.	The guidebook is accompanied by procedures for carrying out coherent classroom design	4
1.	The guidebook is accompanied by examples of appropriate classroom design illustrations	4
2.	Each step and illustration presented is accompanied by complete and clear information.	4
Ease of applying classroom design in a guidebook		
3.	Classroom design procedures are easily applied to learning activities in elementary schools	3
4.	The application of classroom design procedures is discussed with time, cost, procurement of facilities and infrastructures efficiently	3
	Total	**26**
	Total Percentage	**92,8 %**

Discussion

The validity of thematic-based classroom design is taken from the results of expert validation which is the most important data to revise the product to be more perfect. Based on the results of the linguist's test obtained a value of 97.2% and the results got very valid criteria.The results of U-shaped desk chair design activities.

The U-form classroom design process includes the stages of planning and procuring class materials in a sustainable manner, as well as involving teachers in each of these stages. This is in accordance with Mulyono (2008) who revealed that infrastructure management activities can be started by planning and continually working on objects or materials so that they are always ready to use in the teaching and learning process, besides that also supported by Maisyaroh (2004) which revealed that the management of school facilities and infrastructure can involve human resources such as teachers to support the ongoing process of learning and self-development of students.

Test results of linguists get a value of 90.6% included in the qualifications quite valid, so that only requires a small revision. The results of the linguist test in separate grouping formation activities.

Suggestions from language learning experts in the above activities, namely the goal of developing classroom design is expected to create comfortable and enjoyable learning activities, so that there will be a diverse learning experience. This is consistent with Krathwohl and Anderson (2010) which reveals that the focus of meaningful learning lies in the experiences of students in constructing their knowledge, so that the learning environment is expected to facilitate the task of development.

Readability seen from the results of field trials to students states that this thematic-based classroom design has the applicability of obtaining a score of 92.8% with the appropriate category. Suggestions from teacher student activities are more contextual. The results of the activity show in figure 1.

Based on the exposure and activities in figure 1, it shows that in line with the theory of legibility according to Prastowo (2013) explaining the design of thematic learning classrooms as integrated learning products that use thematic approaches involving multiple subjects to provide meaningful experiences to students with contextual environments.

The process of validating readability in class is done in several classes. This activity was carried out aimed at measuring the level of consistency when applied in several classes. The results of the legibility validation process are in the form of suggestions and opinions in the form of qualitative improvements in the future.

CONCLUSIONS

Based on the results of the expert validation questionnaire and the applied questionnaire on thematic-based classroom design products in inclusive schools, it can be concluded as follows:

Judging from the results of the validation obtained, it can be said that the development of thematic-based classroom design in inclusive schools is in accordance with the theoretical foundation and previous research.

Judging from the results of the applicability obtained, it can be said that the development of thematic-based classroom design in inclusive schools can be applied to class V of inclusive schools.

Referring to the inputs during the research process, then thematic-based classroom design research has the following suggestions:

Suggestion of the use of the results of the study of products that have been implemented, the teacher should understand the intent of thematic-based classroom design products by reading the manual.

For the next researchers, they should develop thematic-based classroom design in each relevant education level and other education strata (different classes), so that information can be obtained regarding the level of practicality and applicability.

Suggestions for dissemination to other schools with consideration of analyzing the needs and characteristics of existing schools

REFERENCES

Akbar, S. (2016). *Implementasi Pembelajaran Tematik di Sekolah Dasar*. Bandung: PT. Remaja Rosdakarya Offset.

Borca, C. V. (2010). The school inclusion of children with special educational needs in Romania. *Procedia-Social and Behavioral Sciences, 2*(2), 4325-4329.

Borg, W. R., & Gall, M. D. (1983). *Educationnal Research An Introduction, Fourth Edition*. New York: Longman Inc.

Byl, J., & Kloet, B. V. (2014). The Effect of The Physical Classroom Environment on Literacy Outcome. *America: United States of America.*

Cheryan, S., Ziegler, S. A., Plaut, V. C., & Meltzoff, A. N. (2014). Designing classrooms to maximize student achievement. *Policy Insights from the Behavioral and Brain Sciences, 1*(1), 4-12.

DePorter, B., Hernacki, M., & Abdurrahman, A. (1999). *Quantum learning: membiasakan belajar nyaman dan menyenangkan*. Penerbit Kaifa.

Lopez-Gavira, R., Moriña, A., Melero-Aguilar, N., & Perera-Rodríguez, V. H. (2016). Proposals for the improvement of university classrooms: the perspective of students with disabilities. *Procedia-Social and Behavioral Sciences, 228*, 175-182.

Karwati, E., & Priansa, D. J. (2014). *Manajemen Kelas: Classroom Management*. Bandung: Alfabeta.

Krathwohl., & Anderson. (2010). *Optimal Learning Spaces: Design Implications for Primary Schools*. England: Salford Centre for Research and Innovation in the built and human environment (SCRI) University of Salford.

Maisyaroh. (2004). *Pengembangan Manajemen Kelas*. Bandung: PT. Remaja Rosdakarya.

Mulyono. (2008). *Manajemen Administrasi & Organisasi Pendidikan*. Jogjakarta: Ar-Ruzz Media.

Prastowo, A. (2013). *Pengembangan Bahan Ajar Tematik*. Yogyakarta: Diva Press.

Semiawan, C. R. (2013). *Belajar dan Pembelajaran Pra sekolah dan Sekolah inklusi*. Jakarta: PT Indeks.

Syaifurahman., & Ujiati, T. (2013). *Manajemen dalamPembelajaran*. Jakarta: PT. Indeks.

Vogel, N. (2012). *Arranging the Active Learning Environment High Scope Implementation: Setting up the Preschool Classroom*. highscope.org

Williamson, J. A. (2008). *Literacy In The Student-Centered Classroom :A Practical Approach to Setup, Design,and Implementation*. New York: United States of America.

Wulsin, R. L. (2013). *Classroom Design - Literature Review*. Princeton University.