

**Os Materiais de Ensino para o Desenvolvimento da Tecnologia de Aprendizagem
baseada na construção de caráter**

**The Development Teaching Materials of Learning Technology based on Character
Building**

**Los materiales didácticos de desarrollo de la tecnología de aprendizaje basada en la
construcción de carácter**

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Resumo

Este estudo teve como objetivo produzir materiais didáticos sobre tecnologia de aprendizagem cujos conteúdos são integrados sobre o fortalecimento de personagens embalados usando a fórmula “We Can Do It” ou “KITA BISA”. A palavra "KITA" representa professores e alunos, enquanto "BISA" é um acrônimo dos caracteres Bernalar (Inteligente), Integritas (Integridade), Santun (Polite) e Adil (Justo). O material de ensino desenvolvido foi

destinado a estudantes, professores e observadores da educação, especialmente no campo da tecnologia de aprendizagem. Os dados foram coletados por meio de estudo bibliográfico sobre diversas referências que estavam de acordo com o problema de pesquisa. Esta pesquisa resultou em: 1) modelo de avaliação de reforço de caráter de estudantes, e 2) materiais sistemáticos de aprendizagem de ensino consistem em 9 capítulos: (1) o desenvolvimento, a área e a fundação da filosofia tecnologia de aprendizagem, (2) a fundamentação teórica de tecnologia de aprendizagem e elementos de tecnologia educacional, (3) criação e gestão, (4) uso e utilização, (5) processos e recursos de aprendizagem, (6) facilitação de aprendizagem, (7) melhoria de desempenho, (8) ética profissional e tecnologia educacional e (9) aprendizagem on-line.

Palavras-chave: tecnologia de aprendizagem; materiais de ensino; fortalecimento de caráter; construção de caráter

Abstract

This study aimed to produce teaching materials about learning technology whose contents are integrated about the strengthening of characters packed using "We Can Do It" or "KITA BISA" formula. The word "KITA" represents lecturers and students, while "BISA" is an acronym of the characters *Bernalar* (Intelligent), *Integritas* (Integrity), *Santun* (Polite), and *Adil* (Fair). The developed teaching material was intended for students, lecturers, and observers of education, especially in the field of learning technology. The data were collected through literature study on several references that were in accordance with the research problem. This research resulted: 1) model of students' character reinforcement evaluation, and 2) systematic teaching learning technology materials consist of 9 chapters: (1) the development, the area and the foundation of the philosophy learning technology, (2) the theoretical foundation of learning technology and elements of educational technology, (3) creation and management, (4) use and utilization, (5) process and learning resources, (6)) facilitating learning, (7) performance improvement, (8) professional ethics and educational technology, and (9) online learning.

Keywords: learning technology; teaching materials; character strengthening; character building

Resumen

Este estudio tuvo como objetivo producir materiales didácticos sobre tecnología de aprendizaje cuyos contenidos se integran sobre el fortalecimiento de los caracteres agrupados

con la fórmula "Podemos hacerlo" o "KITA BISA". La palabra "KITA" representa a profesores y estudiantes, mientras que "BISA" es un acrónimo de los personajes Bernalar (Inteligente), Integritas (Integridad), Santun (Cortés) y Adil (Feria). El material didáctico desarrollado estaba destinado a estudiantes, profesores y observadores de la educación, especialmente en el campo de la tecnología de aprendizaje. Los datos se recopilaron a través del estudio de la literatura en varias referencias que estaban de acuerdo con el problema de la investigación. El resultado de esta investigación fue: 1) modelo de evaluación de refuerzo del carácter de los estudiantes, y 2) los materiales de tecnología de aprendizaje de enseñanza sistemática constan de 9 capítulos: (1) el desarrollo, el área y la base de la tecnología de aprendizaje de filosofía, (2) la base teórica de tecnología de aprendizaje y elementos de tecnología educativa, (3) creación y gestión, (4) uso y utilización, (5) procesos y recursos de aprendizaje, (6) facilitación del aprendizaje, (7) mejora del rendimiento, (8) ética profesional y tecnología educativa, y (9) aprendizaje en línea.

Palabras clave: tecnología de aprendizaje; materiales de enseñanza; fortalecimiento del carácter; construcción del carácter

1. Introduction

Learning is a systematic process in which each component influences each other due to the success of students in learning process. It means that students need to interact with learning resources due to achieve the learning objectives. The engineering of learning methodology, including organizing strategies, delivering strategies, and learning management strategies, are needed to be pursued continuously to improve the quality of learning. If those efforts are done, then the learning process could be more effective, efficient, and attractive. Also it could be able to motivate students to learn independently. The attractiveness of learning is measured by the tendency of students to continue learning and interest in the courses. On the other hand, the prepared textbook should also be oriented towards vision, faculty and university missions i.e. loading the character strengthening. In other words, the textbook produced should contain characters' strengthening in each learning process.

Learning resources are important in creating an effective, efficient and appealing learning process for better quality of learning. The facts on the field showed that: (1) learning technology is one of the subjects in under graduate program, such as Department of Elementary Education in Wijaya Kusuma University Surabaya, (2) there is no lecturer has written teaching learning technology materials, (3) students have lack of knowledge and understanding in learning technology lessons that had been taught, (4) there is no learning

resource in the form of teaching-learning technology based on character building. The Education and Culture Ministry of Indonesia stated that strengthening the nationality character is one of the points in *Nawacita* (Nine Hopes of the president) proclaimed by President Joko Widodo through the National Movement of the Mental Revolution (GNRM). This commitment was followed up with the direction of the president to the Minister of Education and Culture to prioritize and cultivate character education (Team for Strengthening Character Building Training Module, 2017).

Therefore, it is necessary to develop instructional material of learning technology based on the strengthening of character through research procedure. This research was conducted in two factors, are: 1) the lack of students' competence to understand and apply the learning technology, 2) no researcher had ever developed teaching learning technology material integrated the characters building compiled by Dick and Carey model.

a. Development of Learning Material

The understanding of teaching materials is appeared in any form of material used to assist teachers or instructors in implementing the learning process (National Center for Competency Based Training, 2007). Teaching materials are the set of materials which organized systematically, both written and oral, and created the environment or atmosphere that allowed students to learn. According to Harvest (2001) as cited in Andi (2011:16), teaching materials are lessons used by both teachers and learners in learning process which organized systematically.

Study of learning technology is given by the Association for Educational Communications Technology (AECT). AECT defined learning technology in two ways, are: 1) as a medium born from the communication revolution that can be used for learning, 2) as a systematic design of conveying and evaluating the total teaching and learning process due to achieve the effectiveness of learning objectives. AECT, 1963, defined learning technology as an audio-visual communication of education theory and practice. This definition pointed out at designing and controlling the learning process, including: (1) studying the weaknesses and advantages of a message in the learning process, (2) structuring and systematizing the instrument in an educational setting. Structure and systematics including; planning, production, selection, management and utilization of part or the whole system of learning. The practical purpose is the use of methods and communication effectively to help the development of potential learners to the fullest.

In 1972, learning technology was a field that facilitated learning process through identification, development, organization and systematic use of various learning and process

management resources (Ely, 1972). Kenneth Silber (1972) incorporated the role and function of practitioners as part of the definition and introduced the "system" in the concept of learning technology. Heinich (1970) and Silber's (1972) stated that learning technologies produce programs and designs to be used and adapted by learners to achieve distance learning goals. There were three concepts in the definition of learning technology, are: (1) learning technology as a field using various learning resources, (2) learning is done individually and personally, and (3) using system approach.

Additionally, in 1977, learning technology was a complex and integrated process, including people, procedure, idea, tool, and organization to analyze problems and designs, to implement, evaluate and manage solutions for all aspects of human learning. It was intended to complete two things; (1) systematic analysis of complex ideas and concepts used in instructional technology field, and (2) show that the concepts and ideas are interrelated (Wallington, 1977). There are three main supporting concepts; (1) process, (2) system approach, and (3) learning resources. Basically, the development in learning technology is explained by the content-message driven, theory-driven learning strategy, physical manifestations and technology of hardware, software and learning materials. Development can be organized in four categories, namely: (1) printing technology (which provides a foundation for other categories); (2) audiovisual technology; (3) theories with computer; (4) integrated technology.

Learning technology can be seen as a field that has special attention to applications, although its principles and procedures are theory-based. The realm of this field has evolved through a struggle between the influence of value, research, and the experience of practitioners, especially the experience with the technology used in learning. Each domain in learning technology is influenced by three things as follows: (1) The foundation of research and theory; (2) The values and perspectives that apply, and (3) The ability of the technology itself.

Alternative Perspective Learning technology is a growing field of science. Technology is irrefutable, is a key identity in this field. This alternative view tends to: (1) Critical assessment of positions that have been considered common; (2) Orientation on alternative theory; (3) Alternative philosophical basis unless the influence of research and theory, learning technology as a field cannot be separated from the influence and technological progress. This new technology provides development opportunities that lead to new problems, including the need to: (1) discover principles for adapting learning in unique

situations; (2) Finding new approaches in interactive learning; (3) Finding learning in a non-formal learning environment.

b. Strengthening Character Education.

President Joko Widodo signed the Presidential Decree Number 87/2017 on September 6th 2017 for strengthening character education. It was explained that strengthening character is the education movement under the educational unit responsibility in strengthening students' character through harmonization of liver, taste, thought, and sport with involvement and cooperation between education unit, family, and community as part of the National Movement of the Mental Revolution. Real-life learning reinforces student understanding. Time for school to synergize with related parties. Of the 18 main values that are carried in character, the school simplifies into five, namely Religious, Nationalism, Mandiri, Gotong Royong, and Integrity. Its application to practice is not by memorization (Kompas, 8 September 2017). According to Presidential Regulation, strengthening character education has objectives to (a) build students as the gold generation of Indonesia 2045 with *Pancasila* (Indonesian Ideology) and build good character's education to face the dynamics of change in the future; (b) develop national education platform that puts character's education as the main passion in education along with the support of public engagement through formal and informal education with respect to Indonesian cultural diversity; and (c) revitalize the potential and competence of educators, education personnel, students, community, and family environment in strengthening character education.

c. Dick and Carey Model

Dick and Carey's model is a system or procedural approach which developed by Walter Dick, Lou Carey, and James O. Carey, which then known as Dick, Carey and Carey model or Dick and Carey model. Theoretically this instructional design offers procedural thinking systematics, which becomes the basis for other design development. The success of the learning process is indicated by the students' activity in learning. It is necessary to design a mature learning from the start goal, understand the students' character, and determine the appropriate model or strategy and evaluation. Dick and Carey model offers a complete design for all the processes already mentioned above. The model could be seen in description below;

1) Identifying Instructional Goals

The analysis of need performance determine the purpose of the developed program or product. The activity of this needs, researcher identifies the immediate priority. By assessing the need, the developer know the existence of situation that should exist (what should be) and the real situation in the real field (what is). By "seeing" the gap, development attempts to offer

an alternative solution by developing a particular product or design. Of course, the plan that will be done is based on theories and empirical studies that have been there before, that it is indeed worthy or worth doing or held a more extensive assessment. In other words, that based on this analysis, development involves a problem or gap and at the same time offering a solution.

2) Conducting Instructional Analysis

The next step of development performance is conducting instructional analysis which includes the skills, processes, procedures, and learning tasks to achieve the learning objectives. This becomes the specification of a product or design that will be developed further and has its own peculiarities.

3) Learning and Analysing Context

This analysis could be done simultaneously along with or after the learning analysis. Analyzing the learner and context which includes the abilities, attitudes, early characteristics of the learner in the learning setting. Also includes the characteristics of the learning setting in which new knowledge and skills will be used to design the instrumental strategy.

4) Formulating Performance Objectives

Formulating performance or goals done after the analysis of learners and context. Formulate goals for work or operations. The description of operational formula reflects the specific purpose of the program or product. This objective provides information to develop test items. Developers perform general purpose translation or from existing competency standards into specific and more operational objectives with specific indicators.

5) Developing Instruments

The next step is to develop the assessment instrument which directly related to the specific, operational objectives. The task of developing this instrument becomes very important. Because the instrument is related to the operational objectives based on certain indicators, as well as instruments to measure the developed device product or design.

6) Developing Instructional Strategy

Develop instructional strategies help learners to achieve specific goals. Specific instructional strategies specifically designed to achieve goals. The designed learning strategy is also related to the product or design to be developed.

7) Developing and Selecting Instructional Materials

This step is a real activity undertaken by the developer. Develop and select learning materials, in this case can be: print materials, manuals for both learners and learners, and other media designed to support the achievement of goals. Products or designs developed based on

specific types, types and models need to be given the argument or reason for choosing and developing based on that type or model. The reasons for choosing the type or model are usually put forward in the subsection of the development model.

8) Designing and Conducting Formative Evaluation of Instruction.

Design and conduct formative evaluation, i.e. evaluations carried out by the developer during processes, procedures, programs or products developed. Alternatively, this formative evaluation is conducted during the learning process with the intention to support the process of increasing effectiveness. Under certain conditions, the developer is quite up to this step Dick & Carey recommends a formative evaluation process consisting of three steps:

- a) One-to-one trying out prototypes of individual materials; these individual trials are conducted to get initial input on a particular product or design. Individual trials are conducted on 1-3 subjects. After that, individual, product, or revised designs are tested.
- b) Small group tryout. The trial involved subjects consisting of 6-8 subjects. The results of this small group trial are used to revise the product or design.
- c) Field trials. This trial involves subjects in a larger class of about 15-30 subjects. During this trial, the developers made observations and interviews. Thus, the developer takes a qualitative approach in addition to quantitative data (test results, attitude scale, rubric and so on). Validation result from step 8 was then used to make revisions in the next step.

9) Performing Instructional Revision

Revisions are made to processes (learning), procedures, programs, or products that are linked to previous steps. Revisions are made to the first seven steps: from general learning objectives, learning analysis, initial behavior, performance or performance objectives, test items, learning strategies and / or learning materials. The instructional strategy is reviewed and finally all these considerations are incorporated into the instructional revision to make it a more effective instructional tool.

10) Designing and Conducting Summative Evaluation.

The results at the instructional revision stage serve as the basis for writing the required tools. The resulting tools are then validated and tested in a class with summative evaluation. Once a product, program or development process has been developed, the next step is to conduct a summative evaluation. This summative evaluation is carried out in order to determine the effectiveness level of the product, program or process as a whole compared to other programs. For the purposes of this development, researchers usually only use until the ninth step, namely formative evaluation in which the design, process, or program has been considered completed. However, for the purpose of testing the effectiveness of the design,

process, and program as a whole, an external test or evaluation is required. Thus, the level of efficiency, effectiveness and attractiveness of designs, processes and programs as a whole are obtained.

2. Methodology

This study was a development research (Borg and Gall, in Punaji Setyosari, 2010) aimed to integrate the strengthening of characters in learning technology materials prepared with Dick and Carey model. According to Borg and Gall, there were 10 steps of research and development, including: (1) collecting research and information, (2) planning, (3) developing preliminary form of product, (4) testing preliminary field, (5) revising main product revision, (6) testing main field, (7) revising Operational product, (8) testing operational field testing, (9) revising final product, (10) disseminating and implementing. The steps of research and development can be seen in the following figure.

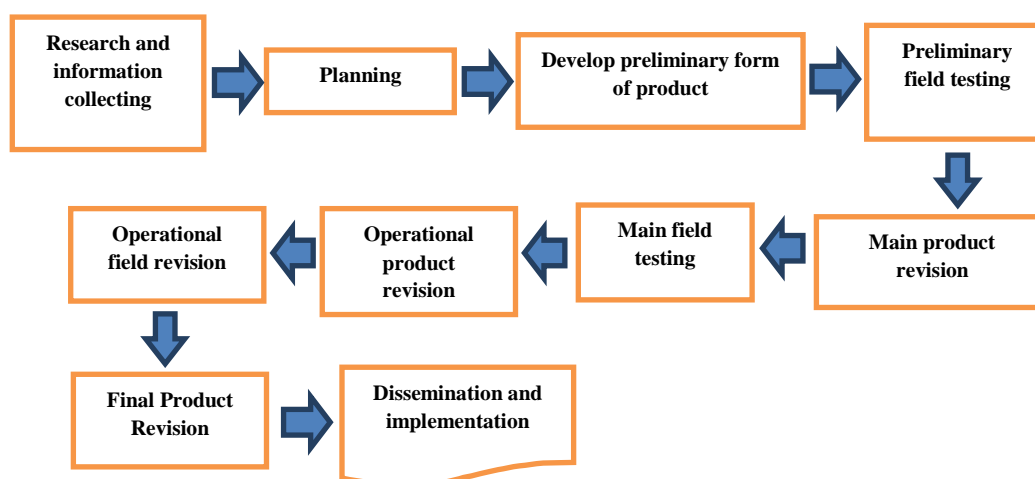


Figure 1. The R & D steps used

The data were collected through literature studies and analyzed the relevant documents and references on theories and concepts: 1) learning technology, 2) aspects of character reinforcement and 3) Dick and Carey model steps. The data were analyzed structured, systematic and integrated to the concept and theory of learning technology, character aspect and model of Dick and Carey.

3. Discussion

Model of Student Character Reinforcement Evaluation.

Model evaluation of student character strengthening using Likert scale, with character score: 1 = Very Less Good, 2 = Less Good, 3 = Good Enough, 4 = Good, and 5 = Very Good.

1) Observation of Student Character Assessment

Instructions: (1) Circle the number: 1/2/3/4/5 to assess the character of the students raised in the learning activities of students in studying the development, understanding and learning technology area, (2) observation conducted by 3 (three) people; (a) 2 student friends, and (b) 1 (one) lecturer or colleague. Description: 1 = Very Less Good, 2 = Less Good, 3 = Good Enough, 4 = Good, and 5 = Very Good.

Table 1 : Observation of Student Character Assessment

No.	Character	Student learning activities	Score
1	Intelligent ("Bernalar")	Discuss understanding of learning technology since 1963, 1972, 1977, 1994, and 2008.	1/2/3/4/5
2		Explain definition and different concept of learning technology in the years 1963, 1972, 1977, 1994, and 2008.	1/2/3/4/5
3		Explain the figures or institutions that build the definition of learning technology.	1/2/3/4/5
4		Present the development of learning technology in the class by using appropriate media.	1/2/3/4/5
5		Discussing the understanding, the kind of area, the different concepts of each region, the figures and institutions that build the definition of learning technology area.	1/2/3/4/5
6		Presenting the understanding, the kind of area, the different concepts of each region, figures and institutions that build the definition of learning technology area.	1/2/3/4/5
7		Discusses the application of each area in the learning process in the class.	1/2/3/4/5
8		Present the application of each area in the learning process in the class.	1/2/3/4/5
9		Discusses the benefits of the learning technology area for school, teacher, and students.	1/2/3/4/5
10		Present the benefits of the learning technology area for school, teacher, and students.	1/2/3/4/5
No.	Character	Student learning activities	Score
11	Integrity ("Integritas")	Students have the responsibility of presenting the understanding of area and learning technology.	1/2/3/4/5
12		Students are committed to presenting the region and learning technology.	1/2/3/4/5
13		Students honestly present area and learning technology.	1/2/3/4/5
14		Students have the bravery to present the area and learning technology.	1/2/3/4/5
15		Students have tolerance in delivering the presentation of area and learning technology.	1/2/3/4/5
16		Students have the discipline in carrying the job / task given by the lecturer.	1/2/3/4/5
17		Students work hard in learning to understand the area and learning technology.	1/2/3/4/5
18		Students have the attitude of tolerance and cooperate in the discussion of the understanding the area and learning technology.	1/2/3/4/5
No.	Character	Student learning activities	Score
19	Politeness ("Sopan/santun")	Students are able to communicate clearly (oral and written) in the discussion and present the learning area and technology.	1/2/3/4/5
20		Students are able to interactive effectively in discussions and present learning areas and technology.	1/2/3/4/5
21		Students respect the opinions and suggestions of others in discussing and presenting area and learning technology.	1/2/3/4/5

22		Students Do not say dirty and abusive in discussions or present area and learning technology.	1/2/3/4/5
23		Students greeting before discussion and presenting area and learning technology.	1/2/3/4/5
24		Students always dress modestly in the discussion and presenting area and learning technology.	1/2/3/4/5
No.	Character	Student learning activities	Score
25	Fair ("Adil")	Students do not discriminate friends in discussions or present area and learning technology.	1/2/3/4/5
26		Students do well and help each other in studying the subject matter of area and learning technology.	1/2/3/4/5
27		Students create a safe, educative and harmonious to learn about the subject matter of the area and learning technology.	1/2/3/4/5
28		Students give other groups an opportunity to respond to the results of the discussion and accept them as material for improvement.	1/2/3/4/5
Score total (ST)			ST
Average = score total / 28			ST/28

Furthermore the Average Student Character Values (RNKM) is confirmed in Table Category of Student Character. Confirmation is to know the character of students in studying the lecture material.

Table 2: Category of Student Character

Average Student Character Values (RNKM)	Category
$1 \leq \text{RNKM} < 2$	Less Good
$2 \leq \text{RNKM} < 3$	Good Enough
$3 \leq \text{RNKM} < 4$	Good
$4 \leq \text{RNKM} < 5$	Very Good

2) Systematic Teaching Learning Technology Materials

Systematic teaching learning technology materials consisting of 9 chapters, namely: (1) The development, the area and the foundation of the philosophy Learning technology, (2) The theoretical foundation of learning technology and elements of educational technology, (3) Creation and Management, (4) Use and Utilization, (5) Process and Learning Resources, (6) Facilitating Learning, (7) Performance Improvement, (8) Professional Ethics and Educational Technology, and (9) Online Learning.

Systematic teaching materials on each Chapter are presented as; (1) General Instructional Objectives, (2) Special Instructional Goals, (3) Lecture Material, (4) Student learning activities, (5) Independent Task, (6) Student Character Assessment, (7) Formative test, and (8) Summative test. This systematics is based on aspects of strengthening the character and the ten steps Dick and Carey model. There are 8 steps in the preparation of this Systematics, which is a modification of the 10 steps Dick and Carey model.

4. Conclusion

It is not easy to integrate teaching learning materials based on character learning refers to ten step model of Dick and Carey. This research aims to produce teaching materials about learning technology whose contents are integrated about the strengthening of characters packed using the formula of “Kita Bisa”. The meaning of “Kita” represents lecturers and students, while “Bisa” is the acronym for (B)ernalar, (I)ntegritas, (S)antun, (A)dil. The developed teaching material is intended for students, lecturers, and observes of education, especially in the field of learning technology. The development procedure use Dick and Carey model which consists of ten stages; identity instructional goals, conduct instructional analysis, analyse learners and contexts, write performance objectives, develop assessment instrument, develop instructional strategies, develop and selec instructional materials, design and conduct formative evaluation of instructu\ion, revise instruction, design and conduct summative evaluations. Meanwhile, the instructional material consists of nine chapters; (a) development, area and philosophical foundation learning technology, (b) theoretical base of learning technology and elements of educational technology, (c) creation and management, (d) usage, (e) process and learning resources, (f) facilitating learning, (g) performance improvement, (h) professional ethics and educational technology, (i) online learning.

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Endang Nuryasana - 25%