Prisma Sains: Jurnal Pengkajian Ilmu dan Pembelajaran Matematika dan IPA IKIP Mataram
https://e-journal.undikma.ac.id/index.php/prismasains/index
e-mail: prismasains.pkpsm@gmail.com

April 2022. Vol. 10, No. 2
p-ISSN: 2338-4530
e-ISSN: 2540-7899
pp. 278-286

Development of Learn to Think (LTT) Model Based on Integrated Twin Tower (ITT) to Increase Scientific and Spiritual Creativity of students in the Early Childhood Islamic Education

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Received: March 2022; Revised: March 2022; Published: April 2022

Abstract

The learning model is one way that can increase student creativity. The study aimed to describe and explain the validity of the Integrated Twin Tower (ITT) based Learn To Talk (LTT) learning model. The research method uses Educational Design Research (EDR) to develop a new product. The ITT-based LTT model was developed in order to increase students' creativity. In addition, as follow-up research from the recommendations of previous researchers. The development of this model will be used as teaching material in the classroom. Blended Web Mobile Learning (BWML) is based on the development of ITT-based LTT learning by following John Deway's line of thought. The results of the content validity of the learning model product, which include needs, novelty, theory, planning, and implementation, get an average value of 3.80; 4.00; 4.00; 4.00; and 3.50 with a very valid category. The results of construct validity, the results were obtained with valid categories for all of them. In that way, the ITT-based LTT learning model can be alternative learning to improve students' scientific creative thinking skills.

Keywords: Development**,** Learn to Talk (LTT), Integrated Twin Tower (ITT), Scientific Creativity

How to Cite: Pangastuti, R., Fadhillah, N., & Prahani, B. (2022). Development of Learn to Think (LTT) Model Based on Integrated Twin Tower (ITT) to Increase Scientific and Spiritual Creativity of students in the Early Childhood Islamic Education. *Prisma Sains : Jurnal Pengkajian Ilmu dan Pembelajaran Matematika dan IPA IKIP Mataram*, *10*(2), 278-286. doi:https://doi.org/10.33394/j-ps.v10i2.4904

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INTRODUCTION

Curriculum development is the most important thing in the world of education. Technological developments and curriculum changes are one of the reasons universities must be more innovative to achieve 21st-century skills (Turiman et al, 2012). The 21st century requires students to master several main skills, namely critical thinking skills, problem-solving skills, decision making, creative thinking, being responsible, and able to learn independently (Palmer, 2002 Palmer, 2003; Suyidno, S et al., 2020) . In science learning, creativity is known as scientific creativity (Mukhopadhyay, 2013 Suyidno, M et al., 2017). Students need creative thinking to be able to solve the problems they will face (Liu, H et al., 2018; Greiff et al., 2014; Unit, 2014 Susilowati, E et al., 2020). Based on these competencies, Universitas Islam Sunan Ampel Surabaya (UINSA) has a large enough role to improve students' quality, process, and learning outcomes. One of them is the students of Early Childhood Islamic Education (ECIC) at the Universitas Islam Sunan Ampel Surabaya through effective and efficient learning in an effort to increase the scientific creativity of students by not ignoring the spiritual aspect as a basic strength and characteristic of a university-based on Religion in Indonesia.

Based on the preliminary studies conducted previously, the results were contrary to the literature review that had been carried out. In general, the results obtained from students and lecturers of the PIAUD Undergraduate Education Program are as follows; 1) Students'

average scientific creativity ability is still low. 2) The spiritual spirit of students still needs to be improved. 3) The learning carried out by the lecturers has not yet led to the design of learning to increase students' creativity and spirituality. 4) The learning model used by the lecturers is still conventional. 5) Learning tools by design do not yet exist as a medium of learning to improve the creativity abilities of PIUAD students. Thus, there is a need for learning innovations, especially in learning designs to train scientific creativity skills of PIAUD students at the Islamic University of Sunan Ampel Surabaya.

The results of relevant research related to learning to increase student creativity is LTT. According to Hu, W et al (2013); Pangastuti and Fadhillah (2020), the LTT learning model was explicitly designed to improve students' thinking skills. Students and teams have plenty of time to discuss current problems (Octavia, 2020). Through the results of a literature study, the LTT learning model has so many advantages including, training students' critical thinking skills, training students' scientific creativity skills, having innovative designs, and practicing creative imagination skills (Hu, W et al., 2013; Maharani et al. al., 2021). On the other hand, the LTT model also has weaknesses in designing experimental-based learning and is still applied at the secondary school level (Wegerif, 2011). That way, this model becomes a new innovation to be applied to universities, especially for PIAUD UINSA students.

In this study, there is a new innovation in the form of ITT-based development. The Integrated Twin Tower (ITT) was developed on the LTT model because it adapted to the needs of this research. This study focuses on PIAUD UINSA students who have their own characteristics, which are always accompanied by religious knowledge. That way, the development of religious knowledge is always in balance with the development of general science which is growing rapidly. With the LTT model integrated with ITT, it not only increases students' scientific creativity but also increases students' religious spirituality, especially PIAUD UINSA students.

Therefore, one alternative that can be done is by innovating the development of the Integrated Twin Tower (ITT)-based Learn To Talk (LTT) learning model as an effort to improve the spiritual and scientific creativity of PIAUD students. The learning model will be developed based on the shortcomings and suitability of the applicable curriculum. With the presence of LTT learning innovations, it is hoped that it can be a solution in strengthening scientific creativity learning for FTK UINSA students in the 21st century. The specific purpose of this research is to improve students' scientific and spiritual creativity skills based on the TNT learning model that is integrated with ITT

METHOD

Type of Research

This research uses Educational Design Research (EDR) research. This design focuses on three main topics, namely design, development, and evaluation. In addition, it also discusses in detail the processes that occur when development is carried out (Nieveen & Folmer, 2013). According to Gall, & Borg (2003), Educational Development Research is a type of research used to develop certain products to be used effectively and appropriately. The proper educational development research product must meet valid criteria, both content and construct, practical, and effective (Jaya et al., 2014).

Research Design The

Generic Design Research Model (GDRM) development steps are 1) identification of problems, 2) identification of product principles and design tentatively, 3) theory and product tentatively, 4) prototyping products, and 5) evaluating and develop product quality (Plomp, 2013).-based LTT learning model ITT by modifying the generic design research model (Nieveen & Folmer, 2013).

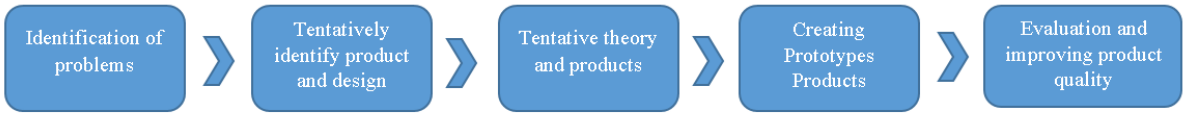

Figure 1. Research Design

Step 1: Identification Problem

Problem identification is based on literature review and literature review. Based on the study results and the urgency obtained, it is from this that development is carried out to produce better outputs. After that, a special study was carried out to find out the learning profile carried out by PIAUD students so that it could be a reference in efforts to increase the spiritual and scientific creativity of PIAUD UINSA students.

Step 2: Identify Product and Design Principles Tentatively

At this step, a special study is carried out for the product and design to be developed. One of the reference sources is the LTT learning model that has been implemented on the subject of science and mathematics in the PIAUD study program. The study material chosen was AUD science. The study of these materials was chosen by considering the characteristics of the material in increasing scientific and spiritual creativity of PIAUD students. According to (Plomp, 2013; Nieveen & Folmer, 2013) the learning model developed can be said to be good when it meets criteria such as the need, updating, having a theoretical basis, and consistency between the components used.

Step 3: Theory and Product Tentatively

Researchers designed Prototype 1, which is an ITT-based LTT learning model with several main components, namely, 1) model syntax, 2) learning indicators, 3) learning methods, 4) support system, and 5) prediction of outcomes and impacts to be obtained. The learning model will be developed in a book with an ITT-based LTT learning model.

Step 4: Making Prototypes and Assessing Products and Theory

Experts will validate the ITT-based LTT learning model that has been developed. In this study, there were two experts who validated the LTT integrated ITT model. The first expert validates related to the content and design. Meanwhile, the second expert validates the components of the learning support model which include learning syntax, supporting theory, and the model approach used.

Step 5: Evaluation and Improving Product Quality This

process refines the prototype of the ITT-based LTT learning model book resulting from the FGD. The results of the FGD are used as a reference for revising the ITT (Prototype 2). The results of this product stated -based LTT learning model ITT was feasible which had fulfilled the aspects of validity and construct validity.

Data Analysis Techniques

The expert, each of whom is an expert doctor in the field of Education. The three experts were collected in a Focus Group Discussion. To describe the validity of the Validation of the ITT, the data on the validity of the ITT that have been collected were analyzed by calculating the single measure inter-rater coefficient correlation (**r**<**).** Meanwhile, to describe the reliability of the Validation of the ITT, the validity of the ITT was carried out by calculating the Cronbach Alpha value (α).based LTT learning model is ITT said to be valid if the single measure inter-rater coefficient correlation (**r**<**)** > r_{table}.-based LTT learning model is ITT said to be reliable if the Cronbach Alpha (α) value > 0.60.

RESULTS AND DISCUSSION

Development of the Integrated Twin Tower (ITT) based Learn to Think (LTT) Model

The ITT-based LTT learning model is known as learning with a scientific approach. This can be known based on the results of library studies, preliminary studies, and relevant research. This learning model refers to learning according to Arends (2012), namely rational, clear goals, learning atmosphere, and a supportive environment. This model is believed to be one of the models to increase the scientific creativity of PIAUD students.

The development of the LTT model is carried out by referring to existing weaknesses. Then, it is modified by adding ITT to each learning syntax that is carried out. On the other hand, this development cannot be separated from Islamic aspects and values which have become the hallmark of the Islamic University of Sunan Ampel Surabaya. By developing this learning model, it is hoped that it can increase the scientific and spiritual creativity of PIAUD students towards the Indonesian Golden Generation.

Characteristics of Learning Model

Learning Model Goals

The development of the ITT-based LTT model aims to increase scientific and spiritual creativity of PIAUD students. To achieve this the need for indicators and syntax that must be met. For more details, see Table 1.

Table 1. Syntax and Skills Indicators Trained

ITT-Based LTT Learning Model Syntax	Indicators of Scientific Creativity	Indicators of Spiritual Aspect
Phase 1: Learning Orientation	Unusual uses; problem finding; Product improvements; Scientific imagination; Creatively science, exprimental, product design, and problem solving	Pray; Worship; Regards, Gratitude; and Tawakal
Phase 2: Scientific Activities	Unusual uses; problem finding; Product improvements; Scientific imagination; Creatively science problem solving; Creatively experimental designing; Creatively product design	Pray; Gratitude; and Tawakal
Phase 3: Reflection on the Process of Scientific Activities	problem finding; Product improvements; Scientific imagination; Creatively science problem solving; Creatively experimental designing; Creatively product design	Pray; Gratitude; and Tawakal
Phase 4: Expansion of	Unusual Uses Activities; problem finding; Product improvements; Scientific imagination; Creatively science, Exprimental, and Product design .	Pray; Gratitude; and Tawakal
Phase 5: Evaluation of	Problem finding; Product improvements; Scientific imagination; Creatively science problem solving; Creatively experimental designing; Creatively product design	Pray; Worship; Regards, Gratitude; and Tawakal

Stages of the Model and Arguments

Learning with the ITT-based LTT model was developed based on John Dewey's problem solving (Arends, 2021) and scientific creativity (Hu, W & Adey, 2002) and assisted with support from the latest learning theory. Based on the theories that have been studied, they become the basis for the preparation of learning steps such as the following; 1) Learning orientation, 2) Scientific Activities, 3) Reflection on the scientific process, 4) Activity management, and 5) Evaluation

Phase 1; Learning orientation, in this phase students are introduced to activities, rules, cognitive conflicts, and constructing the spirit of learning in conceptual thinking about new things. In addition, this cannot be separated from existing theories. This cognitive learning focuses on knowledge of graphic literacy, information, and new concepts with pre-existing knowledge (Aggarwal, 2010). In addition, there is an Advanced Organizer that functions in helping lecturers motivate students to remember the information they just received (Slavin, 2011). This is supported by the results of research from Liu, S and Lin H (2014) and Suyidno et al., (2019) that scientific investigations can be one way to control the learning process of students.

Phase 2; Scientific activities, at this stage students are given the opportunity to explore their own learning strategies. However, students are still facilitated in terms of observing, discussing, thinking, and experimenting. In addition, it is certainly supported by learning theory in producing creative products (Eggen, P & Kauchak, D, 2007). According to Fakhriyani (2016) and Yanti et al (2020), new and unique ideas generated from thoughts are creativity. In addition, according to Meyer (1969) and Rif'at, et al (2020). According to the results of their research, the key to developing students' creativity can be obtained from the freedom of learning that is carried out.

Phase 3; Reflection on the process of scientific, at this stage, students are required to reflect on what they have learned through scientific activity. This is supported by the theory from Moreno & Park (2010), namely by conveying the ideas of students to other people or students, the understanding that will be obtained will be better and be able to assess their respective capacities. In addition, students will be able to solve problems that cannot be solved when there is help from experienced people (Slavin, 2011). Reinforced by the results of research by Gregory et al (2013) and Haryandi et al (2021) that ideas can be developed further as a result of evaluations from other people.

Phase 4: Activity development, at this stage, students are asked to implement what they have learned in everyday life. In this case, according to Bandura's theory, the learning process is the observation of the behavior, which includes attention, retention, production, and motivation. This is inseparable from the reciprocal relationship that Bandura has proposed. In accordance with the results of research that has been carried out by Rotheram (2014) and Zainuddin et al (2020) namely creativity can be obtained from the following results, imagining, discovering, planning, implementing, producing

Phase 5; Evaluation, students carry out evaluation activities from the results of learning that have been carried out to increase the scientific and spiritual creativity of PIAUD students. According to Moreno and Park (2010), self-evaluation can be a strategy to continue growing. However, according to Slavin (2011), late learning is easier to remember when compared to early learning. According to Yesil (2013), this can be anticipated by means that students take part in the process of planning, implementing, and evaluating the learning process, contributing significantly to the achievement of their responsibilities.

Syntax Planning

In order to optimize the impact of implementing the Integrated Twin Tower-based Learn To Think (LTT) learning model, namely increasing scientific and spiritual creativity of PIAUD students, it will describe the implementation of the learning model carried out by lecturers including: (a) planning tasks; (b) interactive tasks; (c) learning environment and task management; and (d) learning evaluation. The things that are done in this planning task are formulating problems, selecting content, conducting analysis, and planning time and space..

Application of Social

The social system in the learning model is based on Vygotsky's constructivist. The social systems that exist in the model syntax include the relationship between students, and the relationship between students and lecturers. This social system emphasizes the construction

of knowledge that each student actively carries out, but the construction will be stronger if they are together. Here's the suggested syntax;

a. Students are pro-active in learning activities by contributing to the scientific and spiritual creativity of PIAUD students.
b. Lecturers act as facilitators in the learning process to improve scientific and spiritual creativity of PIAUD students

Application of the Reaction

On the principle of this reaction, limiting how attention is given to students by lecturers. This includes questions, answers, responses, and what students do. With the ITT-based LTT model, lecturers should act as follows;

a. Lecturers motivate and guide students to stick to the indicators that have been made.
b. Lecturers give input to show the creativity and spiritual aspects of students.

Support System

A support system is needed so that the learning model can be implemented properly. This is in line with Priyayi & Prayitno, (2014) who stated that the conditional atmosphere during teaching and learning activities can improve instructional performance and better learning outcomes as well. Forms of support systems such as learning facilities, materials, tools to apply the ITT-based LTT model. Meanwhile, the special support system for the LTT learning model is as follows;.

a. Learning Devices; lesson plans, student worksheets, syllabus, and evaluation instruments.
b. Other supports such as cellphones, laptops, and applications
c. Good internet network, wifi, and literacy access

Impact Instructional and Companion

The learning model can be said to be effective when in its application it is able to produce and achieve the main objectives of the instructional impact of learning. The impact of the ITT-based LTT model is that students have increased scientific creativity and spiritual attitudes. With the direction provided by the lecturer, there will be an impact on satisfying learning outcomes, namely, mastery of concepts, ICT literacy skills, and positive learning activities.

Learning Environment and Classroom Management

The learning model will always follow the environment and class conditions used. In this case, the ITT-based LTT learning model can be determined if it is well implemented if a good learning environment and media support it. In addition, the need for support from students and lecturers to implement the existing syntax in an effort to increase the scientific and spiritual creativity of PIUAD students.

The validity of the Integrated Twin Tower (ITT) based LTT Learning Model Validity

The validity score of the Integrated Twin Tower (ITT) based Learn To Think (LTT) Learning Model can be seen in detail in Table 2.

Table 2. Validity Scores

Component	Validity and Reliability of the LTT based on ITT			
	Score	Validity	$r_{Validity}$	Content
Needs				
1. Development of Learning To Think (LTT) based on Integrated Twin Tower (ITT)	3.80	VV	0.31	0.89
2. Novelty of Learning To Think Learning Model (LTT) based on Integrated Twin Tower (ITT)	4.00	VV		
3. Supporting Theory Learning Model Learn To Think (LTT) based on Integrated Twin Tower (ITT)	4.00	VV		
4. Planning and Implementation	4.00	VV		
5. Learning Environment Management	3.50	VV		

Component	Validity and Reliability of the LTT based on ITT			
	Score	Validity	$r_{Validity}$	Content
Construct Validity				
1. The Need for Development of the Integrated Twin Tower (ITT)-based	3.60	VV	0.28	0.90
2. Construction of the Integrated Twin Tower-based Learn To Think (LTT) Learning Model (ITT)	4.00	VV		
3. Supporting Theory of Learning To Think (LTT) Learning Model based on Integrated Twin Tower (ITT)	4.00	VV		
4. Planning and Implementation	4.00	VV		
5. Learning Environment Management	3.50	VV		

Description: $r_{\langle =}$ Single measure inter-rater coefficient ; $\langle$ = Cronbach's alpha; VV = Very Valid

Table 2 shows the results of the content validity of the Integrated Twin Tower (ITT)-based Learn To Think (LTT) Learning Model which includes: 1) Development Needs for Integrated Twin Tower (ITT)-based Learn To Think (LTT) Learning Model 2) Novelty of the Learn Learning Model To Think (LTT) based on Integrated Twin Tower (ITT), 3) Supporting Theory of Learning Model Learning To Think (LTT) based on Integrated Twin Tower (ITT), 4) Graphic design planning and implementation, and 5) Environmental Management and classroom learning with the average content validation score was 3.80; 4.00; 4.00; 4.00; and 3.50 including very valid criteria. For the reliability of each component of content validity is also reliable. Table 2 also shows that the construct validity of the Integrated Twin Tower (ITT)-based Learn To Think (LTT) Learning Model which includes: 1) The need for the ITT-based Learn To Think (LTT) Learning Model Development, 2) The Novelty of the Learn To Think (LTT) Learning Model.) based on Integrated Twin Tower (ITT), 3) Supporting Theory of Learning To Think (LTT) Learning Model based on Integrated Twin Tower (ITT), 4) Planning and Implementation, and 5) Management of Learning Environment with an average construct validation score of 3 ,60; 4.00; 4.00; 4.00; and 3.50 including very valid criteria. For the reliability of each component of the construct validity is also reliable.

CONCLUSION

Based on the research results, it can be concluded that the Integrated Twin Tower (ITT)-based Learn to Think (LTT) learning model can be one of the learning models in an effort to increase students' scientific and spiritual creativity. This is supported by the validation results that have been carried out by experts and get valid average results.

RECOMMENDATION

Further research needs to be carried out (next study) by implementing it to see the practicality and effectiveness of the Integrated Twin Tower (ITT) based Learn to Think Learning Model (ITT) to increase scientific and spiritual creativity of ECIE students. In addition, it is hoped that more researchers will develop the LTT Model not only on students' creative thinking, but on 21st century skills

ACKNOWLEDGMENT

Thank you for the support and research funds from UIN Sunan Ampel Surabaya.

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