

# Integration Of Ecology Mathematic Learning Model With Tadabur Qur'an To Improve Student's Optimism

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**Abstract:** ,Optimism can be interpreted as positive generalized outcome expectancies. The purpose of this study is to know the effectiveness of the integration of ecology mathematics learning model with tadabur al-Qur'an to improve student's optimism at Department of Mathematics Education, IAIN Salatiga. This research uses quasi-experimen method. The data is collected using purposive sampling technique with questionnaire. The research questionnaire is developed based on the synthesis of the Revised Life Orientation Test (LOT-R). The result of the reseach is analized using descriptive statistics with a t-test. The result of the research shows that the integration of ecology mathematics learning model by tadabur Qur'an can improve students' optimism significantly. The t-test between the treatment group and the control group shows a difference of 62.9 % (treatment group of 75%, and the control group of 12.1%) in the improvement of students' optimism.

**Index Terms:** Integration, Ecology Mathematic Learning, Tadabur Qur'an, Optimism

## 1 INTRODUCTION

The focus of education in Indonesia is the formation of character for future generations through a combination of intellectual, emotional and spiritual intelligence. Character formation is mandated in the National Education System (Sisdiknas) Law No. 20 of 2003 namely, educating the life of the nation, developing the potential of students to be faithful and obedient to God the Almighty, noble, knowledgeable, capable, creative, independent, and a citizen for a democratic and responsible role. The formation of a strong national character and identity is a marker of educational success from basic education to higher education. Through the characters referred to in the National Education System (Sisdiknas) Law, the characteristics of each individual will be created in the family, community, nation and state. A character is a way of thinking and behaving in his life [1]. Human character is classified in various ways by experts. Seligman and Peterson divide human character into twenty-four types, namely creative, curiosity, openness, loving learning, long-term thinking, courage, perseverance, integrity, strength, loving attitude, kindness, social intelligence good, friendly, fair, leader, forgiving, humble, wise, disciplined, happy with beauty, grateful, humor, spirituality, and optimism[2].

These twenty-four characters are strong characters that must be possessed by humans, including optimism. Optimism is defined as the general expectation of a good future [3]. In the view of Scheier and Carver, optimism is a cognitive construct in which the theoretical footing comes from motivation theory. An important element of optimism is expectations, where there are two main components, namely the value of goals and confidence. Goal and confidence are the driving force for individuals to achieve their dreams. This optimism view is often referred to as dispositional optimism, namely general expectations about a better future. Dispositional optimism focuses on individual beliefs in the future [4], by not questioning the background of individual life good or bad. Someone with high optimism has expectations of good things rather than bad things, while someone with low optimism has a tendency to anticipate negative results and believe difficult situations cannot be changed [5]. Optimism is the basic quality of personality [4], which affects individuals who are oriented to events in their lives. Optimism is a motivation for individuals to form positive actions (Alarcon, Bowling, & Khazon, 2013; Gallagher & Lopez, 2009). Optimists have better happiness, such as greater stress resistance, lower risk for mental health, such as symptoms of depression or anxiety [8], good physical health, and longevity [9] [7]. Other studies show that optimism is able to improve psychological well-being [4]), and predictors of quality of life [10]. In the field of education, optimism as a trigger for students' enthusiasm for achievement, hard working, not giving up, not easily stressed in facing difficulties, and positive thinking for their future. The increase of student's optimism have an influence on confidence to achieve their goals. Optimism can be formed by lecturers through the learning process. Optimism learning creates a learning atmosphere full of collaboration, creativity, and enthusiasm for innovation. Applying optimism learning requires the integration of various knowledge spheres. In other words, the learning process develops the cognitive, the effective, and psychomotor aspects together. To apply the learning as intended use the integration-interconnection approach [11]. Integration-Interconnection can be interpreted as combining several things into a whole and integral unit. The emergence of integration-interconnection approaches is

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based on the dichotomy between religious and general sciences. Furthermore, for the purpose of this study, the term integration is used. Integration as a learning method implement an interdisciplinary approach in the exploration process. The implementation of this method is done by the lecturer by combining some of the science, thus creating a learning process that touches all aspects. Integration can be applied through ecological mathematical models with tadabur al-Qur'an. Mathematics has the universal nature underlying technological developments, with characteristics: (1) the ability to think logically, analytically, systematically, critically, creatively and innovatively, (2) control concepts, algorithms and problem solving skills, and (3) four research objects: facts, concepts, principles and procedures [12]. The ecology mathematical model is a mathematical concept that translates the everyday problems associated with ecology into mathematical languages, then solved using mathematical concepts and translated into everyday language. Based on focus group discussion (FGD) with students, there are many constraints faced by students in studying mathematical models, especially the initial process of mathematical modelling as the foundation of basic assumptions. Difficulties in the early process of mathematical modelling cause students tend to be passive and less optimistic in the modelling process. The goal of the Quran is to help shape human beings into righteous individuals. The requirements of the Quran are for mankind to contemplate, understand, examine and experiment as well as to know the motives and causes for a Quranic verse to be revealed. In fact, the Quran was the reason for the victories and blessings upon Muslims during the era of Rasulullah SAW. The existence of the Quran had changed the soul, moral, and characteristic of the Arab nation to the extent that they were able to build a civilization of knowledge and faith. (Al-Qaradhawi, 2001). Tadabur al-Qur'an can be understood as a professional relationship process between counselors and counselors to help individuals develop their own potential and transcendent aspects [13]. In other words, tadabur al-Qur'an is understood as an approach in helping individuals develop their potential optimally using religion in the process of intervention. Application of religious counselling is done through several techniques, such as prayer, meditation, forgiveness, dan scriptures. The Qur'an is an Islamic holy book used as a guide for Muslim life. In this study, the integration of ecology mathematics learning models with tadabur al-Qur'an is focused on the techniques of reviewing the contents of the holy book of the Qur'an. The Quranic values are used as a foundation for students to solve everyday problems. This is in line with the function of the Qur'an as a guide for life for Muslims. Integration is expected to increase student optimism because religion is believed to have an important function in human life both personal and social. Religion has an important function for humans because it brings its followers to a better future [14][15]. In addition, religion improves individual welfare [16], and psychological well-being [17][18]. The results of the study show that individuals who adhere to a religion have better optimism than those who do not [19]. Religion also has an influence on the views of individuals who are hopeful in the future, consequently, individuals have positive personal stability. Optimism will improve quality of life and life satisfaction [20] [21]. The results of the study of

Monfared and Naderi show that the attitude of individuals who are steadfast in carrying out religion has a strong influence in giving meaning to life and bring positive attitudes and expectations that produce calm [22]. Based on the previous explanation, this research offers the concept of integration in the process of learning mathematical models through thematic interpretation methods with maqashidi (goals or purposes) theory in the process of forming basic modelling assumptions, by means of (1) inventory of verses relating to the model being modelled; (2) use prophetic hadith as the starting point for the problem being modeled; (3) looking for contextualization of the Koran and Hadith on issues that have been inventoried; (4) develop a framework to discuss the problem being modeled; (5) dialogue the values obtained from the text with the concept of ecological mathematical models (6) obtain verses from the Qur'an and Hadith which are used as basic assumptions for the development of ecological mathematical models; dan (7) the application of ecological mathematical models and as well as analyzing to solve everyday problems [23].

## 2 RESEARCH METHODS

The design of this study is quasi-experimental, with two classes (experimental class and control class) at Mathematics Education Teacher Training and Education Faculty, IAIN Salatiga. The experimental class consisted of 36 students (6 boys and 30 girls), while the control class was 33 students (12 boys and 21 girls). The target of this integration learning was tested on Mathematical Model subjects with the topic of Predator Modelling Predator Model. The reason for using the study on that topic is because students in studying ecological mathematical models have a high level of difficulty in the formation of basic assumptions that cause pessimism in solving problems with mathematical modelling. Optimism is measured by using the Revised Life Orientation Test (LOT-R) compiled by Scheier, Carver, & Bridges (1994). LOT-R contains 10 statement items with four items being fillers. Each item is scored on a five-point scale with the endpoint labelled strongly disagree (0) and strongly agree (4). The optimism score is calculated by adding 6 items of optimism and pessimism. On items containing the word "negative" the way of casting is reversed. The internal consistency and reliability of LOT-R are  $\alpha = 0.77$  [24].

## 3 RESEARCH RESULTS AND DISCUSSION

The integration using scriptures in the learning process of ecological mathematical models begins with identifying verses of the Koran relating to the concept of ecology. In this process, the lecturer directs students to review the concept of interpretation in the verses of the Qur'an which contain ecological interpretations. At this stage, students do not experience difficulties because students have studied in several subjects including Tafsir, Hadith, Fiqh and Arabic. After the process of forming basic assumptions through integration, then students translate into the mathematical language using differential language. After forming the mathematical model of integration results, continued with a mathematical settlement process using the concept of differential systems. The process results in a mathematical solution which is then translated into everyday language. The results of the system model constructed are then

proceeded to the process of making simulations using computer programs such as visual basic, Delphi, Turbo Pascal, Matlab, or wolfram's Mathematica. In the mathematical modelling process, many of the dynamics that occur include the formation of basic assumptions as a result of the integration process. The formation of these basic assumptions is very important to be later manifested in the formation of computing programs. In addition to the formation of basic assumptions about mathematical modelling, the dynamics that occur are the emergence of students' optimism about the learning model used. Broadly speaking, the level of optimism of students in both classes (experiment and control) can be delivered in the high (44.9%), medium (52.2%), and low (2.9%) categories. Cumulatively, the optimism of students in this study is medium (52.2%), this is understandable, in general students have good future expectations. The results of this study can be presented in the table below:

**Table 1. Experiment Class and Control Class**

Category	Interval	Frequency	Percentage
High	18 – 24	31	44.9
Medium	13 – 18	36	52.2
Low	6 – 12	2	2.9

The level of optimism of students in the experimental class is greater than the optimism in the control class. In the experimental class, optimism was high (75%), moderate (25%) and low (0%). While the optimism of students in the control class is high (12.1%), moderate (81.8%), and low (6.1%). This difference shows, the integration of the ecological model of mathematics learning model with tadabur al-Qur'an also shows significance in increasing student optimism.

**Table 2. Comparison of Experiment Class Optimism and Control Classes**

Category	Interval	Experiment Class		Control Class	
		Frequency	Percentage	Frequency	Percentage
High	18 – 24	27	75.0	4	12.1
Medium	13 – 18	9	25.0	27	81.8
Low	6 – 12	0	0.0	2	6.1

The results of this study are in line with several previous findings, namely the integration of learning with the religious dimension plays an important role in increasing individual optimism. As the findings of Diener and Myers religion has an important function for humans because it brings its adherents to a better future. The results of the integration of the ecological mathematics learning model with tadabur al-Qur'an deliver an understanding of better religious values to students. A good understanding of religious values also contributes to the improvement of psychological well-being [15][18]. Psychological well-being provides a positive emotional influence in students' lives, including in the learning process and absorbing knowledge. Integration of ecological mathematics learning models with tadabur al-Qur'an in addition to increasing student optimism also has an impact on the emergence of dynamics such as, (1)

students are challenged to connect ecological mathematical concepts with the values of everyday life; (2) foster the spirit of learning two scientific contexts directly (religion and mathematics); (3) complete understanding of prey models predatory modelling concepts as a basis for behavior in life, and (4) Students' understanding touches cognitive, as well as effective aspects. Integration of the ecological mathematics learning model with tadabur al-Qur'an has a positive effect on students, namely improving religious understanding, optimism, and the emergence of positive emotions. These impacts have a major contribution to improving the quality of learning and education in the future. As stated by Hadker et al., optimism will improve quality of life and life satisfaction. Quality of life and student life satisfaction have an important impact on improving the quality of education on a broader scale.

#### 4 CONCLUSIONS AND SUGGESTIONS

Integration of ecological mathematics learning models with tadabur al-Qur'an increases student optimism by 62.9%. This increase is influenced by religious factors that provide a sense of security, the growth of positive emotions, and the resolution of students' psychological problems. The integration of this learning model becomes meaningful if the lecturers and students know about the basic concepts of religion that are applied to the learning model for all clusters of courses.

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