



Research Paper

Analysis and Integration Procedure to Discovery Models and Religious Value in Biology Learning

Aty Mulyani

MAN School, Jambi, Indonesia 36361

Abstract

This study intends to describe the analysis and procedure for integrating the learning model of discovery with religious values in learning biology material using the F1-O1-S1-A1 analysis procedure, compiling a conceptual model with a theory-driven approach literature reviews in combining variables/activities. The researcher involved expert review in integrating the discovery model procedure. The researcher used a measurable validation instrument with seven questions posed in the assessment to get expert views on the analysis process of the integrated discovery model of religious values in biology learning, while the assessment process for the integration of the discovery model was reviewed in all Delphi techniques. The results of the integration procedure of the discovery model with the conceptual design procedure type F1-O1-A1-S1 include activities to analyze problems, formulate hypotheses, determine and collect data sources, analyze data, conclude data, ideate models, validate models, implement models, and evaluate results model implementation. The expert assessment process begins with taking into account the purpose of the assessment, preparation of assessment instruments, determination of experts, and assessment techniques. The result of in-depth interviews with the Delphi technique shows that the integration of the discovery model with religious values in Biology learning was categorized as very good. This means that the analytical procedure and the integration process of the discovery model are feasible to be implemented in biology learning.

Keyword: *analysis, integration procedure, discovery models, religious value, biology learning.*

Received 08 November, 2021; Revised: 22 November, 2021; Accepted 24 November, 2021 © The author(s) 2021. Published with open access at www.questjournals.org

I. Introduction

Learning models are needed in the learning process as a reference for addressing and conditioning the theoretical and logical learning environment according to the design and development objectives (Joyce, B. Weil, M., Calhoun, 2015) in teaching and learning activities structured in one teaching device to achieve goals. {1}. A conceptual framework that includes objectives, measures, environment, and management systems (Arends, 2012){2}. The discovery model is a learning model that was found by Bruner (1960) dan Bruner (1961), so based on the learning theory of cognitivism, behaviorism, and constructivism to encourage students to find their own knowledge based on their interests, talents, and experiences (Bruner, 1966).{3}The student-centered discussion model involves the teacher as a guide and creator of a learning environment that links content, pedagogy, and student development (Albruscato, 1996). {4}. Discovery through discussion can develop critical thinking and skills (Frank X. Sutman, Joseph S. Schmuckler & Joice D. Woodfield, 2008). {5}. Discovery is finding knowledge from experience and experiment (Dahar, 1989){6}; and improve scientific, creative, and individual abilities (Tawil, 2018){7} Integrated learning model is a combination of two or more different subject matter both based on the topic, concept, skill, and unit of integration (Fogarty, 1991) {8} Religious values are the values and beliefs that come from Allah SWT, sourced from the Qur'an and Hadith to solve the problems of human life and achieve happiness in the world and the hereafter (Madran, 2019){9}; (M. Khoirul. Rifai, 2016); implanted in the heart to influence thoughts, words, and actions in life (Aviyah, E., & Farid, 2014) {10}. The validation system and its application are universal compared to the literature that builds the model (Tracey, M. W., & Richey, 2009b){11}. Oriented to a philosophical and theoretical framework of constructive model concepts, leading to high suitability between theoretical and philosophical contexts to increase the possibility of an effective application of the model to learning. Previous research explained that the investigation is very dependent on the subject (Branch, R.M & Kopcha, 2014){12} Research and development of integrating religious values with science (Zain, 2017){13} In general, the discovery was categorized into three types, namely

procedural lesson discovery to find conceptual knowledge from reading; procedural observation of observations to find factual knowledge from observations of the object of study; and laboratory procedural investigations to find procedural knowledge (Frank X. Sutman, Joseph S. Schmuckler & Joice D. Woodfield, 2008) (14) Bell (1978) stated that the purpose of using discovery is to facilitate the exploration of knowledge through scientific activities, to form scientific attitudes such as curiosity, critical thinking, and honesty (Cahyo, 2013). (15) The researcher analyzed the integration of the discovery model to find the relationship between the variables supporting the integrated biology learning, using an eclectic learning model and designing the right model by integrating learning theories. The need for an analysis of the modification of the inquiry model of the procedure to link all the supporting variables in learning biology, the right design model to use is the eclectic learning model design, where the design of this model combines several learning theories to build knowledge from the learning experience. Model integration design (integrative) with a contact approach (Handrianto, 2019). (16); inculturation approach (Soekiman, 2000) (17) at each step of the study to build constructive knowledge focusing on the research process carried out to develop curiosity, critical thinking, and honesty, in the process of scientific approach and application of the scientific method. In detail, the procedure for integrating the religious values integrated discussion model is that each stage must be passed by formulating problems as needed, formulating hypotheses, collecting and analyzing data, concluding, communicating results, and reviewing by doing critical analysis referring to relevant and significant past researches in the application of biology learning in an ongoing basis. The expert assessment process begins with determining the purpose of the assessment, arranging the required instruments and technique, and deciding the experts that will be involved in the assessment.

II. Research Methods

The research method is a R & D (Research and Development) according to (Uebornickel, F., Brenner, 2016); (Tracey, M. W., & Richey, 2009a); (S. Eka., Rusdi. M., Kamid., Marsel, 2013) and used in this research is a theory-driven descriptive conceptual development method, done by reviewing literatures and connecting variables or activities. Based on methodological studies on scientific literature that discusses primary then it becomes a research guide for designing procedures according to research themes and objectives (Tracey, M. W., & Richey, 2009a). The development procedure applies the type 1 conceptual ID instructional by determining the data sources and the basic theories of the conceptual model referring to the synthetic Lee and Jang (Lee, J. Jang, 2014) (17) procedure type 1 F1-O1-S1-A1 described in Figure 1.

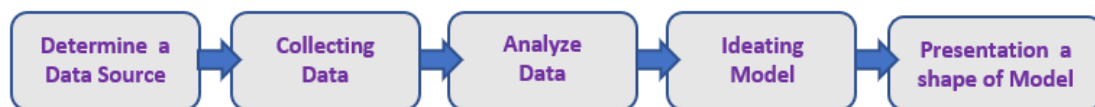


Figure 1: Conceptual Development Design

In this study, the subjects that got involved were validation experts to analyze the preparation of an integrated study of the religious values of procedures through validation questionnaire. This questionnaire instrument contains questions to explore experts' views and revisions to the analysis procedure of the integrated discussion model of religious values on biological material to obtain the appropriate information through in-depth interviews so that it is feasible to be applied in biology learning. Internal and external validation processes are used (Richey, 2005) (18). The internal validation process is carried out in theoretical terms involving developers, by experts who master the components and use of models. Internal validation of the component aspects of the model in a product focuses on the integration of the model and its use. (York. C. Ertmer, n.d.) about the product is Delphi Teknik validated (Muhammad. Nasirullah, 2013) in three rounds, using an open questionnaire (Lee, J. Jang, 2014) While the stages of the external validation process focus on the characteristics of the model as it is carried out after obtaining the feasibility of the internal validation process by experts to be implemented, as well as to obtain in-depth information from experts about the modification of the investigation model procedure.

III. Results And Discussion

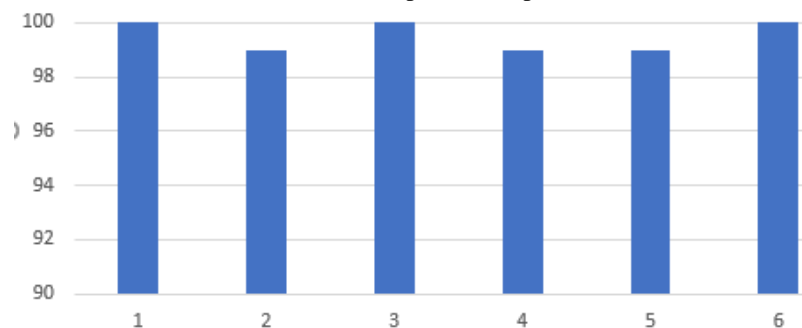
Compiling of the integrated religious value study model follows the procedures based on theory-driven conceptual. Instructional Design Model Approach through literature review type F1-O1-S1-A1 (Lee, J. Jang, 2014) The inquiry model modification procedure was developed in five stages with a combination of functions (F), origin (O), source (S), and scheme analysis (A) type F1-O1-S1-A1, including (1) determining the data source based on the basic theory for the conceptual model developed; (2) collecting data from relevant and significant literature reviews; (3) analyzing data to identify and re-conceptualize related variables/activities to investigate the literature to obtain a component model; (4) logically associating every component of the

conceptual model based on the relationship between variables/activities; (5) presenting the model through a flow diagram of the conceptual model's components.

The development procedure in integration follows five stages, which are: (1) determining the basic theory that is related to integrative learning with a basic cognitivism approach to scientific and constructive knowledge theory with a focus on the process of constructing creative scientific knowledge (Honebein, P. C., & Sink, 2012){19}and the development of scientific patterns through scientific methods; (2) exploring literature reviews to obtain compilation, analysis, and synthesis of the theories needed in the investigation process and models to help researchers have better understanding of the theoretical aspects of the research theme being carried out(Buell, C. A., Greenstein, S., & Wilstein, 2016){20}; (3) involving experts to accept different views on the learning design openly and electively. It was chosen based on the support for an integrated study of religious values and their application to every activity and the clarity of each component of the model which has the same stages and types of analysis to ensure that the results are systematic and dynamic.(Bybee, 2000){21}; (4) explaining new ideas from stages one, two, and three, then were developed and systematically based on experience in designing learning (Joyce, B. Weil, M., Calhoun, 2015){22}. The sequences of steps for combining the discovery model is a description of the learning process that is covered that facilitates the discovery of knowledge through scientific activities, which can form scientific attitudes such as curiosity, critical thinking, and honesty (Cahyo, 2013). {23} The steps to modify the integrated discovery model of religious values cannot be done outside of scientific activities which is constructed and its meaning is created, and throughinculturation in the community, knowledge is disseminated to be absorbed. Through stimulation to orient and focus on learning, to be identified, and finally develop a scientific attitude towards learning. It is comprehensible that students interpret learning, simultaneously to develop scientific attitudes, curiosity, critical thinking(Kim, K., Sharma, P., Land, S. M., & Furlong, 2013){24};(5) the procedure for combining this integrated learning model of religious values is based on the pattern of scientific work and developed to deal with 21st century learning, where the learning process leads to the development of scientific attitudes that support students in dealing with the problems of scientific development in scientific practice and the career world.

The expert review in the procedure for drafting the concept of developing an integrated religious value study model consists of ten statements to solicit expert views and opinions as the main substantive input. The stages of developing an integrated religious value discovery model using the Delphi technique are three rounds, the first of which provides 10 open questions related to the product being developed to validate the integration process of the discovery model. Both continued from the first stage and after being revised in cycles one and two, it came to the third stage as the end of the validation process for the integration of the discovery model. The question in the third stage is the feasibility of implementing the product that has been developed. Afterwards, at the external validation stage, the main focus turns to the characteristics of the integrated religious value study model after obtaining the feasibility of the application process by the validator at the internal validation stage. The results of external validation by practitioners were obtained after the Class Action Research process in one product trial, with the results described in the following table.

Table 1: results of external validation of product implementation in the classroom.



Based on the graph, it can be described that syntax one in total 100% can stimulate students' initial insight, in syntax two 91% of students are challenged to identify the problem posed, in syntax three a total of 100% of students can direct to collect data, in syntax four 91% can be implemented to students, at syntax five 91% can be implemented, and at syntax six 100% can be implemented. So it can be concluded that the overall syntax can be implemented and are easy to implement in the field by practitioners.

The same research procedure was carried out on students through experiments by Kencanawati et al (2021) by modifying the inquiry model for biological learning, using the type analysis procedure F1-O1-S1-A1 (Lee and Jang, 2014). The results of the study are seven stages, starting from formulating problems, formulating hypotheses, collecting data, comparing communication between groups, making conclusions, communicating

results and reviewing results through critical analysis. In general, the expert's assessment process regarding the modification of inquiry model procedure is in the good and very good categories, so it is feasible to be implemented on biology learning.

Meanwhile, the results of this research analysis procedure consist of five stages, namely religious integrated stimulation, identification of religious value integrated problems, integrated data collection of religious values, data processing and integrated synchronization of religious values, and integrated reflection and generalization of religious values.

The comparison between Indah et al. research (Indah, 2021) and this study lies in modified models, learning steps, learning levels, and teaching materials. But both use analysis of type 1 procedures F1-O1-S1-A1 (Lee and Jang, 2014), both on biological materials, and are development research.

The comparison between the development of the discursion model of religious value integration for the development of scientific attitudes of students (Mulyani et al, 2020) with the same development research conducted by Delismar et al (Delismar, Naswir, M. Anggraini, E. Hamidah, 2019) on the integration of natural science in junior high school / Mts in Jambi city is equally research development model, equally integrated model development. the difference at the school level and the integrated field.

IV. Conclusion

According to the experts' assessment process that begins with considering the purpose of the assessment, preparation of assessment instruments and techniques, and determining the experts and its technique involved. The results of in-depth interviews with the Delphi technique resulted in an assessment that the integration of the discovery model with religious values in Biology learning was categorized as good. This means that the analytical procedure and the integration process of the discovery model are feasible to be implemented in biology learning.

References

- [1]. Albruscato, J. (1996). *Teaching children Science A Discovery Approach*. A Simon & Shuster Company.
- [2]. Arends, . Richard. (2012). *Learning to each* (McGrawHill Education (ed.); Tenth Edit).
- [3]. Aviyah, E., & Farid. (2014). *Religiosity, self-control and juvenile delinquency*. *Persona, Indonesian psychology journal*.
- [4]. Branch, R.M & Kopcha, T. J. (2014). *Instructional design models* (Springer).
- [5]. Bruner, J. . (1966). *Toward a theory of intruction*. Norton.
- [6]. Buell, C. A., Greenstein, S., & Wilstein, Z. (2016). *Constructing an Inquiry Orientation from a LearningTheory Perspective: Democratizing Access through*. *PRIMUS*, 75–95.
- [7]. Bybee, R. W. (2000). *Teaching science as inquiry*. American Association for the Advancement of Science.
- [8]. Cahyo, A. N. (2013). *Application Guide for the Most Actual and Most Popular Teaching and Learning Theories*. DIVA Press.
- [9]. Dahar, R. . (1989). *Learning Theory*. Erlangga.
- [10]. Delismar, Naswir, M. Anggraini, E. Hamidah, A. (2019). *Implementation of integrated natural science in junior hing school/MTs level in Jambi city*. *International Journal of Research and Innovation in Social Science*, vol III, 307.
- [11]. Fogarty, R. (1991). *The Mindful School : How To Integrated The Curricula*. IRI/Skylight Publishing.
- [12]. frank X. Sutman. Joseph S. Schmuckler & Joice D. Woodfield. (2008). *The science quest using inquiry/discovery to enhance student learning*.
- [13]. Handrianto, B. (2019). *Islamization of science: An attempt to Islamize Modern Western science*.
- [14]. Honebein, P. C., & Sink, D. L. (2012). *The Practice of Eclectic Instructional Design* (DOI: 10.10). Willew Online Library.
- [15]. Indah, K. A. J. R. A. S. (2021). *Analisis of procedure and process of expert assesment of modifications of inquiry models on biology learning*. *International Journal of Scientific & Technology Research*, 10.
- [16]. Joyce, B. Weil, M., Calhoun, E. (2015). *Models of teaching*.
- [17]. Kim, K., Sharma, P., Land, S. M., & Furlong, K. P. (2013). *Effects of active learning on enhancing student critical thinking in an undergraduate general science course*. *Innovative Higher Education*.
- [18]. Lee, J. Jang, S. (2014). *A methodological framework for instructional design model development: Critical dimensions and synthesized procedures*. *Educational Technology research and Development*. *Asia Pasific Educational Review*.
- [19]. M. Khoirul. Rifai. (2016). *Internalization of multicultural-based religious values in shaping our people*. *Jurnal Pendidikan Agama Islam, Vol 4, No*, 117–133.
- [20]. Madran, U. (2019). *The urgency of religious values in the life of heterogeneous society in Indonesia*. *Jurnal Civic Education, Vol.3 No.1*.
- [21]. Muhammad. Nasirullah. (2013). *Determination of the minimum completeness criteria value using the Delphi technique at SMA Negeri Pamekasan Regency*. *Journal of Educational Policy and Development, Vol. 1 No*. <https://doi.org/10.22219/jkpp.v1i1.1506>
- [22]. Richey, R. C. (2005). *Validating instruction design and development model*. In *J.M.): Mahwah, N.J., Lawrence Erlbau Associates Publisher*.
- [23]. S. Eka., Rusdi. M., Kamid., Marsel, J. (2013). *Inctructional design for mathematitcs orientednhigh older thinking skill*. *American Research Journal Humanities Social Science, vol.20*.
- [24]. Soekiman, D. (2000). *Kebudayaan Indis dan Gaya Hidup Masyarakat Pendukungnya di Jawa Abad XVIII*. Bentang Budaya.
- [25]. Tawil, M. & L. (2018). *Science Learning Theory and Implementation*. UNM Publishing Agency.
- [26]. Tracey, M. W., & Richey, R. C. (2009a). *Design and development research : a models validation case : education tech research dev by AECT*.
- [27]. Tracey, M. W., & Richey, R. C. (2009b). *Model construction and validation: a multiple intelegencies case (55(4))*. *Educational Technology Research and Development*.
- [28]. Uebernickel, F., Brenner, W. (2016). *Design Thinking for Inovation : Research and Practice*. Springer.
- [29]. York. C. Ertmer, P. (n.d.). *Towards an understanding of intructional design heuristics : An exploratory Delphi study*. *Educational Technology Research and Development, 60–70*.

- [30]. Zain, Z. dan R. V. (2017). *National Seminar on Information, Communication and Industry Technology (STINKI) 9 Faculty of Science and Technology. Integration of Science and Islam in the Learning Process of the IPA Clump*”.
- [31]. Lee, J., & Jang, S. (2014). *A methodological framework for instructional design model development: Critical dimensions and synthesized procedures. Educational Technology Research and Development*. Article in Asia Pasific Educational Review. DOI:10.1007/s12564-014-9334-9