



## Development of *Plantae* Accompanied by Nash (*Plantaenash*) Learning Model Based-on Science Literacy to Foster Integrative Thinking Skills

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### Abstract

The learning model that combines nash (al-Quran and hadith) with *Plantae* subjects was developed by the teacher to train integrative thinking's students. This research was aimed to develop a *Plantae* learning model accompanied by nash (*Plantaenash*) oriented to scientific literacy to foster students' integrative thinking skills. Integrative thinking skills in the form of the ability to apply knowledge from various disciplines and contexts into real situations and the ability to analyze. This research method is Research and Development (R & D). The learning model was developed on the basis of needs analysis and particular literature reviews. The research product is a learning model with a teacher's guide sheet. Validity of the products was assessed by experts and teachers with an average score of 85.93% which was classified as "very valid". The results of the effectiveness of the learning model showed a moderate N-Gain value, namely 0.60. The results showed that the *Plantae* learning model accompanied by nash (*Plantaenash*) oriented to scientific literacy to foster students' integrative thinking skills was very valid and effective to use to foster students' integrative thinking skills.

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## INTRODUCTION

The 2013 curriculum in Indonesia contains Kompetensi Inti-1 (KI-1) which reads "to live and practice the teachings of the religion it adheres to". KI-1 deals with the affective domain. Learning for students places more emphasis on completing the material and achieving academic goals, so that the objectives of KI-1 are not a priority and have not been fully carried out in the learning process. The science integration paradigm calls for synchronization between scientific fields (Abdullah et al., 2004). Religion and science are interrelated. Integration means studying one scientific field by utilizing other scientific fields (Mulyono, 2011).

The implementation of science integration is still being formulated so that it is not just a paradigm (Hidayat, 2014). Integration of knowledge at Madrasah Aliyah (MA) began in 2016 through the preparation of integration questions in the Madrasah Science Competition (MSC). This activity is a biennial academic event organized by the Ministry of Religion of the Republic of Indonesia. The aim of MSC is to comprehensively improve the quality of science education in madrasas in studying and understanding science by upholding Islamic values. Biology is one of the fields contested in MSC. Biology has a lot to do with *nashs*. Plants are mentioned in the *nashs* as many as 98 verses of the Al-Quran and a number of hadiths (Baasulum, 1984). *Nash* is a source of law agreed upon by the majority of Islamic jurists, namely in the form of the *nash* of the Al-Quran and Hadith. The nature and position of the *nashs* in the Islamic scientific hierarchy are the main references for the teachings of Islam (Zahrah, without year).

There are 2 types of integration *nash* in learning process, namely 1) integrating *nashs* in the material or learning module (Hamzah, 2015) and 2) inserting verses of the al-Quran in the learning process (Purwanto & Hasanah, 2014). The finding that plants are mentioned in 98 verses of the al-Quran shows that understanding plants as a means of developing scientific thought processes through natural phenomena is an important part of human duties as *kholifah fil ardh* (leaders on earth) (Yasin, 2013). Scientific thinking is needed to explore nature which will lead to strong faith in Allah SWT.

Scientific thinking processes can be carried out through scientific literacy oriented learning.

Scientific literacy is a term for understanding science and the ability to think critically in solving problems using scientific expertise (Haryadi and Retnoningsih, 2015). Scientific literacy is needed so that students understand scientific concepts and processes as a provision to be involved and contribute to community activities (NCES, 2012). Students are involved in the analysis of social science issues and are expected to be able to participate intelligently with the knowledge they have. Issues of social science issues can be obtained through discourse maximally when reading effectively-reflectively. The National Science Teacher Association (2009) revealed that analyzing discourse effectively-reflectively is done by understanding vocabulary, looking for facts in discourse, reflecting information and planning actions. Effective-reflective reading builds students' thinking skills, so that knowledge is formed.

The ability to think scientifically through scientific literacy combined with knowledge of *nash* will foster integrative thinking skills. The ability to think integratively involves understanding several scientific disciplines (interdisciplinary), namely knowledge of *nashs* (Al-Qur'an Hadith) and Plantae material. Students are invited to explore verses of the Al-Quran during class to strengthen faith (Lestariningsih et al., 2017; Amri et al., 2017). Students analyze problems in reading to determine solutions.

Integrative thinking skills are shown through generative reasoning abilities. The main characteristic of generative reasoning is not only thinking about right and wrong about a problem, but the possibilities that will occur even though at the moment it seems impossible (Martin, 2009). Integrative thinking skills are trained by giving problems to students to find solutions. The criteria for integrative thinking include applying knowledge from various scientific disciplines and *connashs* to real situations, analyzing, evaluating and synthesizing information from various sources, using technology to support and improve critical thinking processes (Martin, 2009). Integrative thinking is necessary to face the modern world that is fast changing and innovative.

The Plantaenash learning model oriented to scientific literacy is expected to be an alternative solution for students in facing KSM and improving learning in MA. The virtue of scientificPlantaenash literacy-orientedas a learning model is that teachers and students have scientific literacy which is obtained coherently through a syntax that has been compiled to build integrative thinking skills. This study aims to: 1) develop a valid scientific literacy oriented Plantaenash learning model, (3) analyze the effectiveness of the scientific literacy oriented Plantaenash learning model to foster integrative thinking skills.

## METHODS

The research design used was research development or *Research and Development* (R&D). The resulting product is a Plantae learning model accompanied by *nash* (Plantaenash) oriented to scientific literacy with a guideline as a teacher's guide. The research procedure refers to Gall & Borg (2003) which consists of seven steps. The subjects of

this study were students of class X MIA 1, X MIA 2 and X MIA 3 MAN 2 Ngawi. Model validation is assessed by experts and practitioners. The initial model trial was carried out on 10 random students. The measurement of integrative thinking ability was carried out by means of a test using five esaaay questions on all students X MIA 1, X MIA 2 and X MIA 3. Integrative thinking ability data were analyzed *N-gain* to determine the effectiveness of the learning model.

## RESULTS AND DISCUSSION

### The Results of Learning Model Validation

Development of the Plantaenash learning model oriented to scientific literacy was declared valid by two expert validators and two practitioners. The level of validity of the learning model is determined based on the results of the validation of the four validators. The results of the validation of the Plantaenash learning model oriented to scientific literacy to foster integrative thinking skills can be seen in Table 1.

**Table 1.** Results of Product Validation by Experts and Practitioners

No	Model component	Expert (%)	Practitioners (%)	Average (%)	Criteria
1.	The model developed is based on a clear educational theory.	100	75	87.5	very valid
2.	Have a clear educational purpose.	75	100	87.5	very valid
3.	Has the specificity to integrate Plantae with nash.	87.5	100	93.75	very valid
4.	Has the specificity to foster integrative thinking skills through the analysis of scientific issues.	100	87.5	93.75	very valid
5.	Can be used as a guide for improving the learning process in the classroom	75	75	75	valid
6.	Have a clear syntax	87.5	100	93.75	very valid
7.	Supports scientific literacy skills.	87.5	100	93.75	very valid
8.	Supporting teachers as facilitators in treating and responding to students	75	75	75	valid
	Average	85.94	89.06	87.5	very valid

The results of the validation of the four validators show that the learning model developed is in the very valid category, so that it can be declared feasible to be applied to learning. The model is developed by paying attention to the *output* of students who have the ability to think

integratively and remember *nashs* in the learning process.

Integrative thinking is important for students to get used to being able to find solutions to problems in everyday life. Integrative thinking in this study means the ability of students to answer

integrated questions with *Plantae* with *nashs* scientific literacy oriented. The ability to think integrative is raised through the learning process using the *Plantaenash* model oriented to scientific literacy. Haryadi, Prasetyo and Retnoningsih (2015) stated that through the learning process of scientific literacy it can foster critical thinking skills. The ability to think critically is one of the characteristics of integrative thinking (Martin, 2009).

The integrated *Plantae* learning model *nash* (*Plantaenash*) oriented to scientific literacy has three (3) main characteristics. First, include *nash* in a concrete and in-depth manner in the biology learning process of the *Plantae* material both in the learning device and during the learning process. *Nash* is a source of law agreed upon by the majority of legal experts (jurists), namely in the form of the *nash* of the *al-Kitab* (*Al-Qur'an*) and *al-Sunnah* (*al-Hadith*). Zahrah explained as follows:

إِنَّ الْأَحْكَامَ لَا تُؤْخَذُ إِلَّا مِنْ نَصِّ أَوْ حَمَلٍ عَلَى نَصِّ

"In fact, the laws were not taken except from the *nash* or equations against the *nashs*."

Second, students read and analyze readings related to *Plantae*. Analysis of the reading is to spur aspects of the *connash* and competence of students' scientific literacy. Scientific literacy is the ability to use scientific knowledge and skills, identify questions and draw conclusions based on existing evidence in order to understand and help students make decisions about the natural world and human interactions with nature (OECD, 20013). Learners get maximum information from discourse when reading effectively-reflectively. *The National Science Teacher Association* (2009) revealed that analyzing discourse effectively-reflectively is done by understanding vocabulary, looking for facts in discourse, reflecting information and planning actions. Third, practicum activities and group discussions are carried out to improve the content aspects of scientific literacy. The syntax of the model can be seen in Table 2.

**Table 2.** *Plantaenash* Oriented Science Literacy Syntax

No	Syntax	Learning activities
1.	Get to know <i>nashs</i> related to <i>Plantae</i> .	Read the <i>nashs</i> and their translations. Identify terms in <i>nashs</i> related to the <i>Plantae</i> material
2.	Presenting the <i>Plantae</i> issue.	Respond to scientific issues by asking, responding to, or sharing what is known about the issue.
3.	Tracing facts	Observing the morphology and metagenesis of <i>Plantae</i> . Gathering good information from fellow students, teachers, books, the web and other sources.
4.	Presentation and discussion of the results of activities	Presenting reports on the results of activities

Factors that influence the results of the validity of experts and practitioners in assessing the biology learning model developed are very valid in accordance with research procedures including: 1) The indicators set on the validity instruments of experts and practitioners are in accordance with the provisions of making learning models developed. Activities in the first syntax, namely reading *nashs* related to *Plantae*, make students more familiar with verses related to plants; 2) Language shows sentences that are straightforward, scientific and in accordance with the level of cognitive, affective and psychomotor development of students as well as the competence of teachers who carry out learning.

Wiyanti (2017) states that to obtain good validity results, the development product must adjust the criteria in the validator's assessment items and pay attention to the complexity of students' thinking levels and the competence of teachers implementing learning products.

### The Learning Model Effectiveness

Effectiveness of the learning model is known from the analysis of student learning outcomes using the test Normalized *gain* (*N-gain*). The students' integrative thinking ability was measured by a test, in the form of *Plantae's* integrated description questions with *nashs* scientific literacy oriented. The tools used for the implementation of the learning

model include syllabus, lesson plans, student worksheet, teaching materials and evaluation, which are integrated with nash and use scientific literacy. The analysis results can be seen in Table 3.

**Tabel 3.** The mean value of the pretest, posttest and N-gain results of students

Pretes	Postes	N-gain	Criteria N-gain
41.88	77.97	0.60	moderate

Table 3 shows the results of the analysis obtained N-gain = 0.60. These results indicate that the achievement of integrative thinking skills in the Plantae material which is integrated with nashs through the integrated Plantae learning model of nashs is classified as moderate.

The results of the effectiveness of the model are influenced by the suitability of the test questions with the ongoing learning process. Students reading nashs at the beginning of the Plantae learning process aim to always remember Allah as the basis for carrying out the role of kholifah fil 'ardh which develops scientific thinking processes through natural phenomena (Masrur, 2016). The integration of science and faith in learning can be done if there is material that can support the improvement of faith (Irmania et al., 2016)

The learning process utilizes the latest science issues for students to analyze using the KWL (Know, What, Learn) chart. Analysis of issues by students will add new insights related to Plantae material which is becoming an issue in society. Students are expected to care about problems in society and learn to find solutions with the knowledge they have. This process is the goal of scientific literacy according to NCES (2012).

Students do practicum, look for information, express ideas, ask questions, answer and discuss in the learning process. Students begin to be able to think integratively with the characteristics of 1) being open and responsive to new and different perspectives, 2) making complex decisions and choices, 3) identifying and asking important questions that clarify various points of view and lead to better solutions (Beamer et al., 2012).

The test given uses questions that encourage students to carry out analysis. This is what causes the level of effectiveness in the medium category.

Integrative thinking can be raised by providing a variety of complex problems, carrying out interdisciplinary learning and solving problems collaboratively (Martin, 2009).

## CONCLUSION

The model integrated Plantae learning *nash* (Plantaenash) oriented to scientific literacy according to expert judgment is appropriate to be used to foster integrative thinking skills. This is evidenced by the results of expert validation which state that the learning model is categorized as very valid. The development of the integrated Plantae learning model *nash* (Plantaenash) oriented to scientific literacy was declared to be effective in learning at MAN 2 Ngawi.

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