

A Needs Analysis on the Development of Learning Applications Based on Science, Al Qur'an and Nature

Budiyono Saputro^{a*}, Muh Zuhri^b, Mansur^c, Muh. Saerozi^d, ^aAssoc. Prof, Science Education, Faculty of Teacher Training and Education, State Institute of Islamic Studies (IAIN) Salatiga, Indonesia, ^bProf., Islamic State Law Faculty, State Institute of Islamic Studies (IAIN) Salatiga, Indonesia, ^cProf., Education Faculty, State Institute of Islamic Studies (IAIN) Salatiga, Indonesia, ^dProf. Magister Program of Islamic Religious Education State Institute of Islamic Studies (IAIN) Salatiga, Indonesia, Email: ^{a*}budiyonosaputro@iainsalatiga.ac.id

This research aims to obtain the levels of need and to describe the need of development of learning application based on science, Al Qur'an, and nature. This research uses the descriptive method applying survey approach. Subjects of this research are 40 lecturers at the study program of Natural Science in Indonesian Natural Sciences Lecturer Association. Research instrument used is questionnaires with Likert scale of 1-5. Data is analysed using statistic descriptive method. The results of research show that the need analysis using questionnaires applies four indicators. Those indicators are (1) the average score of the learning model of the digital era is 3.61 (much needed); (2) the average score of learning strategy based on science, Al Qur'an, and Nature is 3.41 (needed); (3) the average score of the implementation of learning based on science, Al Qur'an, and nature is 3.53 (much needed); and (4) the average score of the compatibility of the application in the social religious field is 3.54 (much needed). Description of needs analysis shows that respondents need (1) interactive learning applications between lecturers and students for reflection, communication, and learning feedback; (2) a problem-based learning model, which is a project learning model to create meaningful learning and student activity; (3) interpretation material based on the theme of integration that facilitates the classification of material; and (4) the concept of material that can be used in campus, social, and religious communities. Therefore, the results of the needs analysis



strengthen the basis of development of learning applications based on science, Al Qur'an, and nature with interactive updates, connection with problem-based learning models, and material that is accessible for students and the public.

Key words: *Needs Analysis, Application, Science, Al Qur'an, and Nature.*

Introduction

Learning activities in the era of the industrial revolution 4.0 require the ability of lecturers to develop skills in mastering learning technology. The use of the internet and online learning is an urgent matter in supporting out-of-school learning for millennial people. Online learning is usually called E-learning. According to Rosenberg (2001), E-learning is the use of internet technology to distribute learning materials, so students can gain access from anywhere. In the ILRT of Bristol University (2005), E-learning is defined as the use of electronic technology to support, to send, and to improve teaching, learning, and assessment. Meanwhile, according to Udan & Weggen (2000), E-learning is part of remote learning while online learning is part of E-learning. The term E-learning includes various applications and processes such as computer-based learning, web-based learning, and the virtual classroom. Online learning is part of technology-based learning that utilises internet, intranet, and extranet resources. Some research results are relevant to the development of learning applications. One of the researches is conducted by Huda et. al. (2018), and it shows that online learning resources can improve student performance and achievement. According to El-Khalili & El-Ghalayini (2014), student learning achievement and student perceptual satisfaction are increased by learning objects designed with sophisticated learning technology, which is better to achieve targetted learning goals. Hong & Xinyi (2019) show that online learning resources can help achieve learning goals. Oktavianti, Handayanto, Wartono, & Saniso (2018) obtained research results that show the ability of students' scientific explanation increases significantly after they experience blended learning in Physics through E-scaffolding. Meanwhile, Wang (2019) shows that blended learning has a significant effect on the increase of digital art teaching. According to Wahyuni Wahyuni, Sanjaya, Erman & Jatmiko (2019), science learning with the edmodo-based blended learning model can motivate learning and improve critical thinking skills of junior high school students. Chootongchai & Songkram (2018), based on their research findings, reveal that online learning systems have a positive influence on students' thinking abilities and innovation. According to Songkram (2017), learning online can improve students' creativity and innovative skills scores. Wiana, Barliana & Ariyanto (2018) show that interactive multimedia based on motion graphics is effective in improving student learning in concept mastery indicators and in aspects of fashion design in a digital format. According to Bastian, Lumenta & Sugiarto (2016), the design of Android-based learning applications of computer introduction can help learners. Shang (2016) also shows that Wechat can be used as decent, comfortable, and efficient remote learning. Chatwattana



(2017) shows that a website learning system makes students able to obtain efficient learning from the system. Various communication tools are used to support and to promote collaboration and activities in the system. According to Zahroh (2015), an E-learning-based learning model of integrated social studies has the aim to provide facilities and infrastructure that are very supportive/adequate, accelerating the expansion of opportunities for education as well as improving the quality of education. This is in accordance with the purpose of technology in the learning process, which is to solve problems and to facilitate students' learning activities. Aripin (2018) shows that teachers must be able to create and to develop mobile-accessible learning content. For now, that is the media widely used by students in their daily lives. The results of research conducted by Wang & Jiang (2018) show that online learning has practical value in its implementation. A research conducted by Maryani (2013) states that E-learning facilitates learning for lecturers and students. According to a research result conducted by Ngabekti, Prasetyo, Hardianti & Teampangpong (2019), the STEM mobile ecosystem learning package has good validity and readability. It is effective in students' scientific and technological literacy. Meanwhile, according to Budiaman (2010), the use of the internet as a medium of learning generally increases learning motivation. This is in line with Bellefeuille, Martin, & Buck (2005) who state that *technagogic* is an amalgamation of the concepts of technology and pedagogic of which means an interactive-productive relationship between learners and students in exploring digital technology integrated with effective teaching. According to Munir (2009), technology and information-based learning brings up E-Learning. Less (2018) says students can achieve a strong understanding of the nature of science by developing a balanced appreciation of theoretical and empirical scientific inquiry.

Science, Al Qur'an, and Nature material has the potential to be delivered in an integrated manner. Integrated Learning Materials Science, Al Qur'an and Nature can use website media and e-learning applications. Implementation of learning by using applications by integrating the potential integration of Science, Al-Qur'an and Nature can enrich the insight and understanding of the competencies of graduates of Indonesian Natural Sciences. According to Johnston, Sideris & Witt (2017), science is used as a strategy related to development, innovation, conservation, and restoration as well as belief in the spiritual. Collado Ruano (2018) states that nature, science and religion complement each other – in line with Zarman's (2016) opinion which states that the Qur'an and nature complement each other. According to Beyers (2016), man has a strong relationship with nature. Therefore, man has a responsibility to nature. Taylor (2020) notes that religion can prevent the collapse of the earth's biocultural system.

Verses of Al Qur'an about nature that can be integrated in e-learning applications are presented in table 1.

Table 1: Surahs in Al Qur'an about Science and Nature

Surah	Meaning
(QS. Ali Imran: 190).	<i>"Indeed, in the creation of the heavens and the earth, and the alternation of the night and the day are signs for those of understanding"</i>
(QS. Ali 'Imran: 191)	<i>Who remember Allah while standing or sitting or [lying] on their sides and give thought to the creation of the heavens and the earth, [saying], "Our Lord, You did not create this aimlessly; exalted are You [above such a thing]; then protect us from the punishment of the Fire."</i>
(QS. Al-An'aam: 73)	<i>And it is He who created the heavens and earth in truth. And the day He says, "Be," and it is, His word is the truth. And His is the dominion [on] the Day the Horn is blown. [He is] Knower of the unseen and the witnessed; and He is the Wise, the Acquainted.</i>
(QS. Al A'raaf: 54)	<i>Indeed, your Lord is Allah, who created the heavens and earth in six days and then established Himself above the Throne. He covers the night with the day, [another night] chasing it rapidly; and [He created] the sun, the moon, and the stars, subjected by His command. Unquestionably, His is the creation and the command; blessed is Allah, Lord of the worlds.</i>
(QS. At Taubah: 36)	<i>Indeed, the number of months with Allah is twelve [lunar] months in the register of Allah [from] the day He created the heavens and the earth...</i>
(QS. AL Anbiyaa: 30)	<i>Have those who disbelieved not considered that the heavens and the earth were a joined entity, and We separated them and made from water every living thing? Then will they not believe?</i>

Table 1 shows the surahs about Science and Nature in Al Qur'an. In addition to the surahs in table 1, there are many more surahs on Science and Nature in Al Qur'an. Related to integrated learning, according to the results of research conducted by Saputro, Mas'ud, Saputra, & Kuswaya (2019), it is shown that learning science interpretation based on a study program of natural science tadrīs can effectively improve the student's learning outcomes. This can be seen in the results of paired t-test = 12.684 or Sig. (2-tailed) p = 0.00 < 0.05. Whereas, Laeeq & Memo (2018) recommend a research by proposing an integrated model to improve the existing e-learning environment by combining potential modern learning support technologies with a Virtual Learning Environment.

Based on the above explanation, the researcher conducts a research on needs analysis of the development of learning applications based on science, the Qur'an, and nature. The products in this research are the average scores, the category of level of need, and the description of



the need to develop learning applications based on science, Al Qur'an, and nature. The results will support the main product, which is a learning website based on Science, Al Qur'an, and Nature that integrates these three aspects of learning material. This learning website based on Science, Al-Qur'an, and Nature is created with the aim of being a medium to facilitate lecturers and students in understanding and interpreting a learning model that integrates Science, Al Qur'an, and Nature. This learning website connects with any problem-based learning model. Thus, the graduates of Indonesian Natural Science can apply science that is integrated in campus, school, and social religion in the community. This learning website can also be used in general by other learning communities, such as for lecture material, Friday sermons, Islamic studies, and recitation.

Methodology

Research Goal

This research is a descriptive research applying a survey approach. This research is conducted on lecturers of study programs included in the Indonesian Natural Sciences Lecturer Association, starting from December 2019 to April 2020. The research population is still limited because the study program of natural science under the Ministry of Religion of the Republic of Indonesia has only 8 study programs. Thereby, 40 lecturers from the Natural Sciences of IAIN Salatiga, IAIN Bengkulu, IAIN Ponorogo, IAIN Kudus, IAIN Cirebon, IAIN Ambon, UIN Riau and UIN Mataram are selected as respondents. This study uses an instrument in the form of a questionnaire that the respondents answer with a Likert scale of 1-5.

Data Collection

Data was obtained from the needs assessment on the questionnaires distributed to the respondents. The data is quantitative, gained from the average score of questionnaires with a Likert scale of 1-5.

Data Analysis

Data is analysed using the descriptive statistic method by calculating the mean (M) value and graph. After that, description of the data is categorised into four – namely, much needed, needed, less needed, and not needed.

Results

The result of level of necessity of the development of learning applications based on science, Al Qur'an, and nature is seen in tables 2 to 5.

Table 2: Learning Model of Digital Era

No	Questions	Average score n=(40)	Description
1	Do you need online learning in today's lectures in the study program of Natural Science?	3.78	Much needed
2	If needed, do you need only online learning, or an additional application that can be connected to other applications such as zoom or <i>google</i> classroom?	3.55	Much needed
3	Do you need online learning that can be delivered by a teaching team in integrated learning? (E.g. integrated science, Al Qur'an, and nature)	3.50	Much needed
	Average score	3.61	Much needed

Based on table 2, the average score for the need of a learning model of the digital era with Likert scale of 1-5 is 3.61 (much needed), answered by 40 respondents of lecturers in the study program of Natural Science.

Table 3: Learning Strategy based on Science, Al Qur'an, and Nature

No	Questions	Average score n=(40)	Description
1	Do you need a two-way interaction in online learning in lectures in the study program of Natural Science?	3.73	Much needed
2	Do you need a course description and learning objectives in online learning in lectures in the study program of Natural Science?	3.58	Much needed
3	Do you need a "theme" menu on the online application in the learning based on science, Al Qur'an, and nature?	3.25	Needed
4	Do you need a Google connecting menu to search for articles/papers/scientific journals in online applications in the learning based on science, Al Qur'an, and nature?	3.45	Much needed
5	Do you need notification in the online application in the learning based on science, Al Qur'an, and nature?	3.25	Needed
6	Do you need a menu of verses and surahs of Al Qur'an in the online application in the	3.63	Much needed

	learning based on science, Al Qur'an and nature?		
7	Do you need a recording menu of verses and surahs of Al Qur'an in the online application in the learning based on science, Al Qur'an and nature?	3.13	Needed
8	Do you need an interpretation menu in the online application in the learning based on science, Al Qur'an, and nature?	3.63	Much needed
9	Do you need a rating menu in the online application in the learning based on science, Al Qur'an, and nature to find out the assessment/frequency visits by students/readers?	3.03	Needed
	Average score	3.41	Needed

Based on table 3, the average score of the need of a learning strategy based on science, Al Qur'an, and nature with Likert scale of 1-5 is 3.41 (needed), answered by 40 respondents of lecturers in the study program of Natural Science.

Table 4: The implementation of learning based on science, Al Qur'an, and nature

No	Questions	Average score n=(40)	Description
1	Do you need guidance for online learning in the learning based on science, Al Qur'an, and nature?	3.53	Much needed
2	Do you need online learning tutorials in the learning based on science, Al Qur'an, and nature?	3.65	Much needed
3	Do you need online communication/comment column in the learning based on science, Al Qur'an, and nature?	3.48	Needed
4	Do you need an online test menu in the learning based on science, Al Qur'an, and nature?	3.48	Needed
	Average score	3.54	Much needed

Based on table 4, the average score of the implementation of learning based on science, Al Qur'an, and nature with Likert scale of 1-5 is 3.54 (much needed), answered by 40 respondents of lecturers in the study program of Natural Science.

Table 5: The compatibility of the application in the social religious field

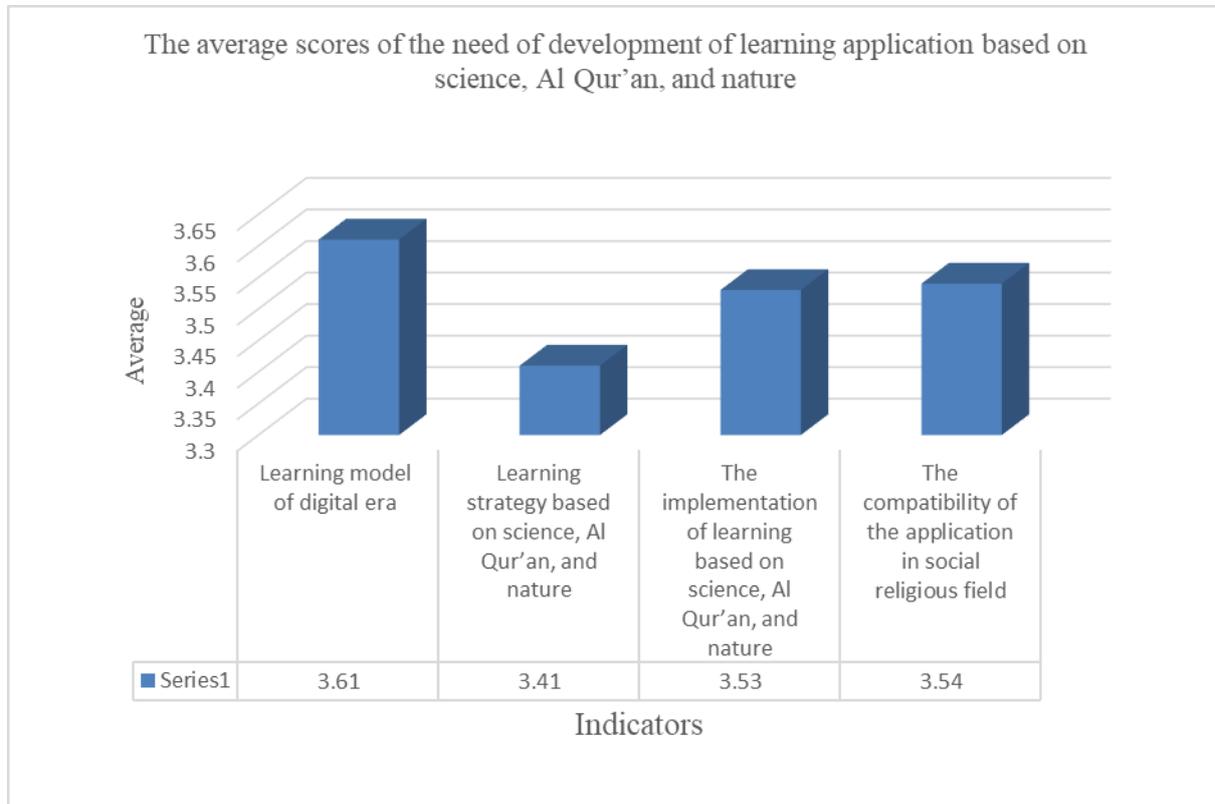
No	Questions	Average score n=(40)	Description
1	Do you need an interpretation menu on science, Al Qur'an, and nature to be used in Islamic Studies, lectures, and community service?	3.58	Much needed
2	Do you need an interpretation menu on science, Al Qur'an, and nature to be able to mingle with people, both within the campus and the community?	3.48	Much needed
	Average score	3.53	Much needed

Based on table 5, the average score of the compatibility of the learning application based on science, Al Qur'an, and nature in the social religious field with Likert scale of 1-5 is 3.53 (much needed), answered by 40 respondents of lecturers in the study program of Natural Science. The results of table 2 to table 5 can be categorised in four aspects of needs of the development of the application, as seen in table 6 and figure 1.

Table 6: Indicators of aspects of needs of the development of the application

No	Indicators	Average n=(40)	Description
1	Learning model of digital era	3.61	Much needed
2	Learning strategy based on science, Al Qur'an, and nature	3.41	Needed
3	The implementation of learning based on science, Al Qur'an, and nature	3.53	Much needed
4	The compatibility of the application in the social religious field	3.54	Much needed
	Average score	3.52	Much needed

Figure 1. Graph of the need for the development of learning applications based on science, Al Qur'an, and nature:



Discussion

Based on the needs analysis of the development of learning applications based on science, Al Qur'an, and nature using questionnaires with Likert scale of 1-5, there are four indicators, namely (1) learning model of digital era; (2) learning strategy based on science, Al Qur'an, and nature; (3) the implementation of learning based on science, Al Qur'an, and nature; and (4) the compatibility of the application in the social religious field. The mean score of all indicators is 3.52 (much needed). This is in accordance with the results of a need assessment of the previous research conducted by Saputro Saputro, Marjuni, Kuswaya, Saputra & Fadly (2019) on the development of the interpretation learning model of integrated science with the average score of 4.70 (much needed). The results are strengthened by a research conducted by Saputro et.al (2019). It is stated that needs assessment on the learning in the industrial revolution era 4.0 by lecturers should be included in the Indonesian Natural Science Lecturer Association (Asosiasi Dosen Tadris IPA or ADRISPA). The lecturers are from the study programs of Natural Science in IAIN Salatiga, IAIN Kudus, IAIN Jember, IAIN Ponorogo, IAIN Cirebon, IAIN Bengkulu, UIN SUSKA Riau, UIN Mataram, IAIN Kendari, and UIN Sunan Ampel Surabaya. The results of the needs assessment show that of 45 respondents in the study program of Natural Science at ADRISPA Indonesia, 100% of them say they really

need online learning or E-learning. According Zubaedia, Rahman Hakim, M.A, & Asiyah. (2020), the production of teaching material is the result of development through a needs assessment. The result of a research that is relevant and strengthens this research is a study conducted by Santoso (2014). It is stated that to improve the competence of teachers in the field of video engineering, needs analysis should be in the 'good' category. According to Mäensivu, Uusiautti, & Määttä (2012), to be able to work, an assistant in inclusive schools requires self-development and support from teachers, students, and parents. Cankaya & Denizli (2020) show that the level of competency needs is the most powerful predictor of happiness for students. Based on some previous researches that are relevant to needs assessment, the writer can conclude that needs assessment plays an important role in supporting and increasing success in activities and learning. Likewise, in the research that the author conducts, the needs assessment for the development of learning applications based on science, Al Qur'an, and nature will support the learning process, especially in science interpretation courses. According Kubsch, Nordine, Neumann, Fortus, & Krajcik (2019), there is a strong relationship between integrated knowledge and the knowledge used. Cacanaska et.al. (2019) states that religion is an important source or foundation of morality, and determines human attitudes toward nature. While according to Muhamad, Syihab, & Ibrahim (2020), al Quran and Sunnah have important values for environmental sustainability.

Conclusion

The levels of need for the development of learning application based on science, Al Qur'an, and nature of lecturers in the study programs of Natural Science in the Indonesian Natural Science Lecturer Association that is obtained through questionnaires with Likert scale of 1-5 in four indicators are: (1) the average score of a learning model in the digital era is 3.61 (much needed), (2) the average score of a learning strategy based on science, Al Qur'an, and Nature is 3.41 (needed), (3) the average score of the implementation of learning based on science, Al Qur'an, and nature is 3.53 (much needed), and (4) the average score of the compatibility of the application in the social religious field is 3.54 (much needed). Description of analysis shows that respondents need (1) an interactive learning application between lecturers and students for reflection, communication, and learning feedback; (2) a problem-based learning model, project learning model to create meaningful learning and student activity; (3) interpretation material based on integration themes that facilitate classification material; (4) material concepts that can be used in campus life, social, and the religious community. The results of this needs analysis can be used as a basis for the development of learning application models with the innovation of interactive learning application models based on science, Al Qur'an, and nature that can be run with a problem-based learning model and learning material that is easily accessed by students and the public.



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