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Enhancing Students Cognitive Abilities in Integrated Islamic High Schools: A Need-Based Analysis for Developing Chemistry Modules Infused with Islamic Values

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ABSTRACT

From an Islamic perspective, motivation to learn and achievement goes hand in hand with faith and piety. Integrated chemistry learning with Islamic values at the Integrated Islamic School is a learning innovation to improve students' cognitive abilities. This research aimed to analyze the needs of students in the integrated chemistry module of Islamic values to upgrade students' cognitive abilities. This study used the descriptive qualitative method. Data was taken from 112 students of class X Integrated Islamic High School in Surakarta. Data were collected using observation, interviews, questionnaire sheets, and analysis of teaching materials. The results of student and teacher interviews show that integrating Islamic values in each subject will increase student interest and motivation in learning. This is in line with the Integrated Islamic school's vision and mission and is supported by more dominant Islamic activities. Structured learning models integrated with Islamic values are believed to be learning innovations that can improve learners' cognitive abilities, skills, and attitudes as a whole. However, the analysis of teaching materials used in the Integrated Islamic School has not supported achieving the above objectives. As a result, it is necessary to develop a chemistry module with a constructivist approach integrated with Islamic values.

1. Introduction

The development in the 21st-century learning era has always demanded efforts to improve the quality of education by the times' challenges. All curriculum that has been implemented is inseparable from the educational objectives to be achieved. The purpose of national education contained in the Sisdiknas Law number 20 of 2003 states that education serves to develop skills and form noble national character and civilization to educate the life of the nation, develop the potential of learners to become human beings who believe and fear God almighty, noble character, healthy, knowledgeable, capable, creative, independent, and become democratic and responsible citizens [1].

The Indonesian government has carried out improving the quality of education by presenting the 2013 curriculum, a learning device used to realize national education goals. Elements of changes in curriculum content standards in 2013 are in the emergence of core competencies (KI) consisting of four parts: spiritual attitudes, social attitudes, knowledge, and skills. These core competencies must

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be implemented in every learning, including chemistry subjects, not specifically for citizenship education and religious education [2].

SMA Islam Terpadu (SMA IT) emerged as an alternative school to improve the quality of national education and provide reforms in the world of education. SMA IT aims to develop learners into intelligent human beings with noble morals and skills that benefit humanity [3]. The learning curriculum used by SMA Islam Terpadu refers to the national curriculum combined with the Islamic approach, which integrates religious science and general science. Islamic science is integrated into science by instilling Islamic values in every learning connected with the material being studied. This is done so that students have the competence of knowledge, skills, spiritual attitudes, and social attitudes. These efforts can be realized by the role of teachers, parents, and the community/environment [4].

Chemistry as a science contains values that can be applied contextually and actually to the learner's life so that the material can be absorbed and foster Islam in the learner [5]. Othman (2014) stated that the balance of nature would occur if it considers three aspects: integration and a balanced relationship between man, nature, and God [6]. Chemistry, which belongs to the branch of science, is very closely related to religion. About science with religion, it has been a long time before the term Integration existed within the normative framework of Islamic values in science learning, emerging the idea of Islamization of science that became jargon with the great welcome of Muslim scholars. The Islamization of science is a reintegration of science in countering secularization that does not follow the beliefs adopted by a Muslim. It is now known as integration [7]. The integration of Islamic values in chemistry learning refers to developing a curriculum that distinguishes integration at four levels, namely the level of philosophy, material, methodology, and strategy [8].

In science learning, correct understanding of concepts requires good cognitive abilities of learners; cognitive abilities are behaviors that can be observed due to activities or processes gaining knowledge through one's personal experience. The wiggle room of an individual's cognitive activity is his or her mental activity, which includes the use of concepts and rules that have been possessed, especially when facing a problem[9]. Anderson and Krathwohl (2001) classify the dimensions of cognitive processes in six levels, namely 1) Knowing, 2) Understanding, 3) Applying, 4) Internalizing, 5) Evaluating, and 6) Creating [10]. At levels one and two, the Lower Order Thinking Skill (LOTS) level is low thinking because it is recalling and able to explain the knowledge that has been studied. Level three is called Medium Order Thinking Skill (MOTS) level, a moderate level of thinking because it is already in stages and can use its information or knowledge for other fields. Levels four, five, and six are higher-order thinking skills (HOTS) that are higher thinking because they have been able to analyze, and validate to provide a solution to create ideas or ideas independently.

The cognitive abilities of learners are directly related to the achievements of the learners. Student achievement can be used as a benchmark to determine the quality or criteria of expected learners based on educational objectives [11]. Learning achievements on a national scale can be seen from national examinations (UN) organized by the government. Based on data from the national examination of chemistry subjects in the last four years (2016-2019), the learning achievements of high school students in science majors still show unsatisfactory results[12]. The results of unchemical values can be seen in Table 1.

Table 1. Average Chemical Value of UN Senior High School Results in 2016-2019

No.	Year	Average Chemical Value
1	2016	54,10
2	2017	53,05
3	2018	50,56
4	2019	50,29
Four-year average		52,00

The average chemical value in un four consecutive years was obtained at 52.00. This indicates a still low understanding of learners in chemistry. The results of national examinations in chemistry subjects that are still low are certainly a problem that should be considered by all parties, especially educators in the field of chemistry. This encourages every educator to seek innovation in the chemical learning process to improve learners' learning achievements.

Observations made at two Integrated Islamic High Schools in Soloraya showed that the national curriculum's objectives had not maximally carried out the chemical learning process. The learning process is still often only teacher-centered. Chemistry learning lacks process training in developing learners' skills, so in the learning, process learners tend to be inactive to ask or answer questions. On the other hand, the observations showed that the learning process carried out by lecture methods internalized with Islamic values and examples in daily life increased the interest in learners' learning chemistry. This internalization process is expected to improve learners' cognitive abilities, skills, and attitudes in learning chemistry.

Based on the results of interviews with learners, their responses to existing teaching materials are that the material but not interesting, a monotonous appearance, and do not contain Islamic values that empower learners' spiritual attitude and social attitudes. The chemistry teacher also stated that the teaching materials used are only limited to package books from the office and practice book problems in the market and MGMP in the region. The results of this interview are strengthened by the analysis of teaching materials used in learning. It shows that the teaching materials have not followed a certain syntax and have not provided practice questions that can train a complete understanding of learners' concepts of materials and skills [1].

Chemical learning with integrated teaching materials and Islamic values is proven to improve learner learning outcomes and is also effectively used to improve the motivation and learning achievement of learners; Rahmah has conducted this research, S. Z. et al. (2017) who can improve the learning outcomes of learners by using sets-based chemistry modules integrated Islamic values at SMAI Surabaya. Chemical modules accompanied by a compound of Verses of the Quran proved to increase learners' motivation and learning achievement [14]. More broadly, Hamidi F. et al. (2010) proves that Quran-based learning can improve the mental health learners expected to trigger the learners in line with what was explained in Lenggono & Yuzarion's research (2020) that the motivation of learners to learn grows along with the increasing faith and piety. Meaningful intentions and objectives will evoke the motivation of achievement in learners [11].

2. Method

This research uses a qualitative research method. Data was taken from 112 students and two chemistry teachers at two Integrated Islamic High Schools in Soloraya, Indonesia. The selection of participants was purposive sampling. Students are students studying in class X who have studied atomic structure materials in the first semester of the 2019/2020 school year. Questionnaire result data is analyzed by percentage calculation following the formula [17].

$P = n/N \times 100\%$

Description:

P = Percentage score (%); n = Number of scores obtained; N = Maximum score

Chemical learning with integrated teaching materials and Islamic values is proven to improve learner learning outcomes and is also effectively used to improve the motivation and learning achievement of learners; Rahmah has conducted this research, S. Z. et al. (2017) who can improve the learning outcomes of learners by using sets-based chemistry modules integrated Islamic values at The instruments used in this research are observation sheets of the learning process, questionnaire sheets,

interview materials, and analysis of teaching materials. Questionnaire sheets are given to students and teachers. The questionnaire content validity test has been conducted using the formula Aikens produces values 0.87 – 1.00 and an average value of 0.89 [18]. Therefore, the content is declared valid out of the five validators [19]. The questionnaire sheet for learners consists of 14 questions. The contents of the question include chemistry learning, learning methods, teaching materials for learning, the learning process with teachers, and the needs of learners in learning chemistry. The questionnaire sheet for teachers consists of 17 questions with the contents of questions, including the creation of learning instruments, learning methods in the classroom, teaching materials used, the response of learners in the learning process, and teachers' needs in the learning process.

Learners and teachers are interviewed with interview guidelines that contain several open questions to find out why they are giving yes or no answers to each question. The interview guidelines consist of 9 questions for students and 12 questions for teachers. Observation learning methods are also carried out with some observation question guidelines. The resulting data is analyzed descriptively and interpreted. Analysis of teaching materials and modules used in the learning process using assessment by BSNP 2016 standards for school teaching materials integrated with Islamic aspects and empowerment of students' cognitive abilities.

3. Results and Discussion

The Integrated Islamic School (SIT) is a development of educational institutions in Indonesia that emerged at the end of the 20th century. SIT combined two important elements in education, namely religious science and science. The curriculum used in SIT refers to a national curriculum enriched with Islamic values in every learning. In other terms, integrate religious science and general science. This integration is expected to produce a generation of people who have complete cognitive abilities, attitudes, and skills to face life's challenges by the times [5].

This study aims to analyze the needs of learners and teachers in developing integrated chemical modules of Islamic values that are expected to improve learners' cognitive abilities in the Integrated Islamic School. This research was conducted by the descriptive qualitative method. Research data are analyzed descriptively and inter-achievement. The observation stage has been done to collect preliminary information directly on the learning process before the polling data collection, interviews, and analysis of teaching materials at two Integrated Islamic Schools in Soloraya.

Observations made directly during chemistry learning showed that the students were conditioned to be active in the discussion, but the teacher still played a full role in the learning process. Students use package books and PR books (practice questions) as teaching materials during chemistry learning. In the discussion process, students only answer questions asked by teachers or those in the practice book with variations in questions that are still dominated by problems with cognitive levels of C1 to C4. Stages in the learning process have not implemented the learning model expected by the national curriculum that can develop learners' learning skills and independence.

More specifically, to know the needs of learners to chemical modules then distributed questionnaires to learners. The questionnaire consists of several questions to answer yes or no, that is accompanied by reason. The contents of the questionnaire cover learners' needs in learning chemistry, such as learning styles, teaching materials, and teaching methods. Questionnaire analysis showed that 79% of students were enthusiastic about chemistry learning, although 54% said chemistry lessons were difficult to learn. Chemistry lessons are new materials that students learn at the high school level and are important for science concentration, so learning chemistry requires great attention. This is reinforced by several students' interviews and data on national chemistry test results in the last four years [12], showing continued decline at the national level. This indicates learners' low ability to understand chemical concepts and understand problems at a higher cognitive level. In 2018, hots are included gradually to improve the quality of the problems, which will become standard until 2025 [21].

The have poor understanding of learners to the concept of chemistry is because they think that chemistry is an abstract lesson related to the number of atoms and molecules in each material. This is also because chemistry is a misconception-prone subject because there are dozens of analogies that learners must understand [22]. Learners can also have difficulty distinguishing between fundamental terms or keywords from different atomic models, for example, electron skins and electron clouds in confusing atoms [23].

Learners stated that they practiced chemistry learning. The availability of laboratories and libraries helps learners understand the concepts taught by teachers (85%). In comparison, students have textbooks or other handbooks such as PR books to study the concept of chemistry (57%). Students (46%) have difficulty studying the concept of chemistry using books used in terms of the completeness of the material, its format, explanation techniques, etc. Besides, many of the learners (96%) states that teachers have used special teaching materials in teaching chemical concepts, for example, Student Worksheets (LKPD), power points (PPT), videos, props, etc. However, in atomic structure material, learners (28%) still have difficulty understanding the material despite using the teacher's available teaching materials and methods. Learners (30%) states that atomic structure material includes elusive matter due to abstract matter and the many confusing terms.

This is following Burrows & Mooring (2015), which reveals that learners can only complete chemistry in general but lack conceptual understanding of some topics fundamentally. This can be seen from the many exercises that are dominated by cognitive levels of C1-C4. However, the national chemistry examination still gets low grades because of the spread of various types of problems.

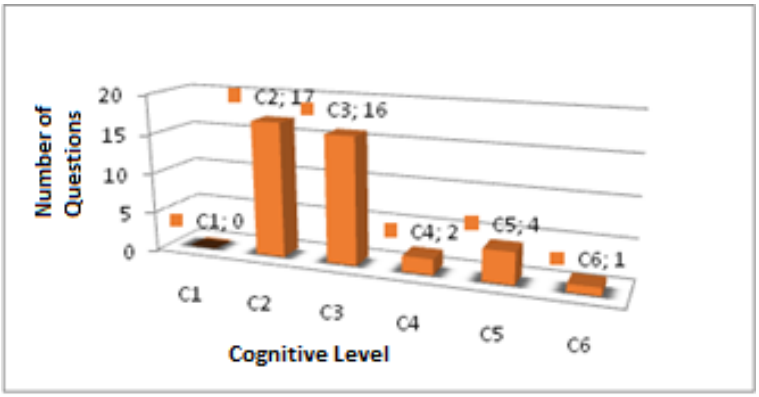

Fig 1. Cognitive Level Diagram of UN Chemistry Problem in 2017

Based on the Figure 1 diagram above [12], showing the problems of UN chemistry in 2017 with cognitive levels of C2, C3 is still the most common question, while the problems with cognitive levels of C4, C5, and C6 are still in very small amounts. Indicators of UN chemistry were analyzed based on cognitive dimensions, according to Anderson and Krathwol. This shows that UN Chemistry in 2017 has not fully presented the problem with the high-order thinking skill (HOTS) category to empower learners' cognitive abilities to the highest level.

The structure of atoms was chosen as a chemical material in this study. This is because the atomic structure is the initial material in class X as the basic concept for studying chemistry afterward. Atoms' structure becomes the main focus because the value generated by learners in this material is still relatively low. The following is presented in Table 2 analysis of national examination score data at SMA IT in Soloraya for the last four years [12].

Table 2. Percentage of Chemical Problem Rulers of National Examinations on Atomic Structure Materials at two IT High Schools in Soloroya

Indicators of Subject	Cognitive Level	Academic year	Sch	Cit/Reg	Prov	Nat
Given periodic system images of elements with basic notation (which is not actual), learners could precisely determine their electron configuration, atomic number, and relative atomic mass.	C3	2015/2016	69,23 96,08	71,17 73,92	72,37 72,37	67,94 67,94
Given two images of Thomson's experiment, students were able to select the most appropriate statement about cathode rays based on the experiment results.	C4	2016/2017	66,67 52,63	57,93 57,74	58,14 58,14	54,02 54,02
Determine the group, period, and notation of the element correctly (Image of the trajectory of ion electrons).	C2	2017/2018	87,50 88,46	72,09 74,69	72,01 72,01	62,46 62,46
Determine the exact statement concerning the statement and the image of the atomic model.	C5	2018/2019	30,00 59,09	38,23 41,67	36,70 36,70	39,68 39,68
Determine the relationship of element notation, neutron protons, orbital diagrams, electron configurations, and the location of elements in the periodic table.	C4		70,00 50,00	53,72 46,92	45,53 45,53	42,73 42,73
Determine the electron configuration of an element (without using noble gas notation) based on element notation.	C2		100,00 100,00	100,00 100,00	99,81 99,81	95,39 95,39

Description: Sch: School; Cit/Reg: City/Regency; Prov: Province; Nat: National

The main key to success in learning chemistry is the knowledge and understanding of learners towards chemistry. Learners' knowledge of the atomic structure gained in school will be a complete understanding of scientific thinking due to learning resources from inside and outside the classroom. The analysis of atomic structure material in the national examination showed that the achievements obtained by the two Integrated Islamic schools in the Soloraya area are still relatively low, especially on questions with cognitive level indicators C4-C6. This shows that learning in schools has not been optimized to empower students' cognitive abilities, so students cannot solve problems at higher cognitive levels. This is reinforced by the results of student interviews that state the difficulty of clearly understanding the experiments of the theories underlying the atomic theory's existence. Atoms and their particles (protons, electrons, neutrons) are abstract things that are not easy to understand where they are found and where they are.

Lovet and Chang (2005) suggested chemistry learning using methods that fit the chemical concept's characteristics. Abstract chemical concepts can be taught through constructivist approaches using insular analogies. Constructivism is one of the schools derived from the theory of cognitive learning. This approach used in learning aims to help improve students' understanding of issues or subject matter. Constructivism is closely related to the discovery of learning methods and meaningful learning concepts. According to Glasersfeld (1987) in learning with a constructivist approach emphasizes; that (1) learners are active in constructing their knowledge; (2) Social interaction is important for the construction of knowledge.

Learners (98%) expressed enthusiasm and pleasure when the teacher conveyed wisdom or connected the material with Islamic values in everyday life during the learning process. This is supported by the results of interviews of learners who say that it; they know what the benefits of chemistry are learned for the surrounding life and are happy with the material being studied. This is

in line with Ausubel's statement in Dahar (2011:) that meaningful learning is a process of linking new information to relevant concepts that contain a person's cognitive structure, even if we do not know the biological mechanisms of memory or the storage of knowledge, we know that information is stored in some regions of home regions process of integration of Islamic values is considered in line with the constructivism approach in learning.

Islamic values are a set of intertwined and inseparable life principles which teach people how to live life in this world. Students in the Integrated Islamic School of all Muslims are expected to live by Islam's central teachings, namely following the Quran and As-Sunnah. Therefore Islamic values must be practiced in the daily life of humanity. There are three main dimensions of value in Islam, namely, tawhid, sharia, and morals. However, Islamic values are more prominent in the form of moral values [36]. In line with that, Halstead (2007), in his research, concluded that there are three central values in Islam, namely (1) morality, which refers to the commands and responsibilities established by sharia and in Islamic teachings in general, (2) adab, which refers to behavior that maintains good relations, and (3) the quality of character possessed by a good Muslim, following the example of the Prophet Muhammad SAW [37]. Therefore, the faith and piety of a Muslim will be in line with the motivation of achievement. A Muslim's achievement is a good deed that can be a means of preaching to other people.

The development of learners' cognitive abilities is also supported by guidance, direction, and motivation from the environment. This is in line with Vygotsky's opinion (in Sujiono, 2008), which states that cognitive ability and mindset are not the basis determined by genetic factors but the result of the activity or environment in which the individual lives[39]. The Integrated Islamic School environment seeks to create an Islamic atmosphere and activities following Islamic shari'a in the educational process. Therefore, the integration of Islamic values in every learning, both in general science, is considered very motivating for learners in learning to improve learners cognitive abilities. Motivation can play a role in strengthening learning if a person who learns is faced with a problem that needs to be solved and can only be solved thanks to the things he has been through.

Learners (71%) stated that teachers obtain teaching materials in the form of package books and PR books as training materials for studying atomic structure materials. Chemistry teachers in the two schools have not made independent teaching materials, so they still use teaching materials from the market. The analysis of textbooks and modules used in both schools showed that the teaching materials used were not structured with specific learning models or approaches that could support the learners' cognitive abilities as a whole. Also, in the teaching process, teachers rarely use specific learning models, centered only on teachers. The process is nothing more than a process of receiving and processing information submitted by teachers and textbooks.

What is more, the questions used only refer to textbooks without analyzing the cognitive levels of learners. It is not by the direction of the 2013 curriculum that in science or chemistry, learning must rely on the activeness of learners, and they must gain real experience in the learning process. Every learning should shape the morals and personalities of both learners and increase their piety towards Allah SWT [1]. Similarly, the teaching materials used can contain these directives to help learners learn independently and develop themselves.

One of the learning models that can be used by the 2013 curriculum is to empower the active participation of learners in the learning process in schools is the learning model of search, solve, create, and share (SSCS). Chen's research (2013) states that the SSCS model can help learners empower cognitive abilities such as creative thinking and generic science skills. The use of the SSCS model in the learning process received positive responses from learners and improved learners skills. Nastiti et al. (2018) stated from the results of their research that chemical modules based on the SSCS model effectively improve the generic skills of science in class X atomic structure materials of SMA Negeri in Surakarta. Learners (40%) from both IT high schools claimed to have studied with the learning model Search, Solve, Create, and Share (SSCS) in the classroom only in other terms, but the stages are similar [33].

In general, students (83%) state they need alternative teaching materials that can help more easily understand atoms' material structure. Learners (95%) agreed, if necessary, to develop teaching material in the form of SSCS-based chemical modules that are integrated with Islamic values to facilitate understanding of atomic structure materials and increase knowledge of science. The results of a study stated that learners are more interested in using and reading material from modules. Modules can make learners more active in the learning process, namely with the presence of easier-to-understand languages, questions, discussions in groups, and problem-solving in the module. Problem-solving skills in learners are also increasing by using metacognitive-based modules in mathematics learning.

Overall, from the results of this study, students need a chemical module that integrates Islamic values by using SSCS learning models to improve learners cognitive abilities. Learning processes integrated with Islamic values can increase the motivation of learning and predation and the learning outcomes of learners[11][13].

4. Conclusion

Integrated chemistry modules of Islamic values in the Integrated Islamic School can be used as a means in the learning process by the SIT curriculum's peculiarities. Modules that combine natural sciences and religious sciences by using appropriate learning models are expected to improve students' cognitive abilities of SMA Islam Tepadu in learning chemistry.

References

[1] Depdiknas. (2003). *Undang-undang Nomor 20 Tahun 2003 tentang Sistem Pendidikan Nasional.* Departemen Pendidikan Nasional. Jakarta.

[2] Susilowati, S. (2017). Pengembangan Bahar Ajar IPA Terintegrasi Nilai Islam untuk meningkatkan Hasil Belajar IPA. *Jurnal Inovasi Pendidikan IPA*, 3(1), 78-88.

[3] JSIT Indonesia. (2006). *Sekolah Islam Terpadu Konsep dan Aplikasinya*. JSIT Indonesia. Bandung.

[4] Muhab, Sukro, *et al*,. (2010). *Standar Mutu Sekolah Islam Terpadu : Jaringan Sekolah Islam Terpadu*. JSIT. Jakarta.

[5] Fatonah, S. (2006). *Integrasi Nilai-nilai Ajaran Islam Dalam Pembelajaran (Studi Kasus pembelajaran Kimia di SMA Islam Terpadu Abu Bakar Yogyakarta*. Magelang.

[6] Othman, M. y. H. (2014). Islamic Science (Tawhidic): Toward Sustainable Development. *Kyoto Bulletin of Islamic Area Studies*, 7, 110-123. Retrieved from https://www.asafas.kyoto-u.ac.jp/kias/pdf/kb7/10eal_Yusof Hj Othman.pdf

[7] Ikhwan Afiful. (2014). Integrasi Pendidikan Islam (Nilai-nilai Islam dalam Pembelajaran). *Ta'allum Jurnal*, Vol. 2, No. 2, p. 179-194.

[8] Abdullah, A. (2004). *Kerangka Dasar Keilmuan dan Pengembangan Kurikulum UIN Sunan Kalijaga Yogyakarta*. Yogyakarta: Pokja Akademik, 9-14.

[9] Winkel, W. S. (1996). *Psikologi Pengajaran*. Grasindo. Jakarta.

[10] Anderson, L.W., & Krathwohl, D.R. (2001). *A Taxonomy for Learning, Teaching and Assessing: A Revision of Blooms Taxonomy of Educational Objectives*. New York: Addition Wesley Longman.

[11] Lenggono, B., & Yuzarion. (2020). Motivasi Berprestasi pada Siswa SMA dalam Perspektif Islam. *Jurnal Psikologi Terapan dan Pendidikan*, 2(1)(2020), 22-33.

[12] National Education Assessment Center (Puspendiknas). *Data Hasil Ujian Nasional PAMER UN*. Ministry of Education and Culture, 2016.

[12] National Education Assessment Center (Puspendiknas). *Data Hasil Ujian Nasional PAMER UN*. Ministry of Education and Culture, 2017.

[12] National Education Assessment Center (Puspendiknas). *Data Hasil Ujian Nasional PAMER UN*. Ministry of Education and Culture, 2018.

[12] National Education Assessment Center (Puspendiknas). *Data Hasil Ujian Nasional PAMER UN*. Ministry of Education and Culture, 2019.

[13] Rahmah, S. Z., Mulyani, S., & Masykuri, M. (2017). Pengembangan Modul Berbasis SETS (Science, Enviroment, Technology, Society) Terintegrasi Nilai Islam Di SMAI Surabaya pada Materi Ikatan Kimia. Jurnal Pendidikan, 2(1), 57-62.

[14] Hidayati, N., Saputro, S., & Susilowati, E. (2018). Keefektifan Modul Kimia dengan Kompendium Ayat-ayat Al-Quran pada Sekolah Berbasis Pesantren. *Jurnal Kependidikan*, 2(2), 320-332.

[15] Hamidi F., Bagherzadeh Z., Gafarzadeh S. (2010). The Role of Islamic Education in Mental Health. *Social and Behavioral Sciences*. 5 : 1991–1996.

[16] Sugiyono. (2013). *Metode Penelitian Pendidikan*. Alfabeta. Bandung.

[17] Ali, M., & Asrori, M. (2014). *Metodologi & Aplikasi Riset Pendidikan*. PT Bumi Aksara. Jakarta.

[18] Nastiti, D., Rahardjo, S. B., Van Hayus, e. S., & Perdana, R. (2018). The Need Analysis of Module Development Based on Search, Solve, Create, And Share to Increase Generic Skills In Chemistry. *Jurnal Pendidikan IPA Indonesia (JPII)*, 7(4)(2018), 428-434.

[19] Aiken, L. R. (1985). *Psycological Testing and Assessment*. Allyn and Bacon.

[20] Suyatno. 2015. Integrated Islamic Schools in the National Education System. *Jurnal Al-Qalam*, 21(1), 1-9.

[21] Muhadjir, E. (2018). Kemendikbud Susun Soal UN 2018 dengan Instrumen HOTS. *e-newspaper*, retrieved from https://www.republika.co.id/berita/nasional/umum/18/04/02/p6jwfu359-kemendikbud-susun-soal-un-2018-dengan-instrumen-hots.

[22] Ardiansah, A. (2016). Identifikasi Konsep Alternatif pada Guru Kimia: sebuah Kajian Literatur. In *Prosiding SNSP* (*Seminar Nasional Pendidikan Sains*) (Vol. 3, pp 49-54).

[23] Ruengtam, P. (2013). Modeling ff Cooperative/Colaborative Learning Technique: A Case Study of Interior Architectural Program. *Procedia – Social and Behavioral Sciences*, 105(2013), 360-369.

[24] Burrows, N. L., & Mooring, S. R. (2015). Using Concept Mapping to Uncover Students Knowladge Structures of Chemical Bonding Concept. *Chemistry Education Research and Pratice*, 16(1), 53-66.

[25] Taber, K. S. (2014). The Significance of Implicit Knowladge for Learning and Teaching Chemistry. *Chemsitry Education Research and Practice*, 15(14), 447-461.

[26] Zarkadis, N., Papageorgiou, G., & Stamovlasis, D. (2017). Studying the Consistency between and within the Student Mental Models for Atomic Structure. *Chemsitry Education Research and Practice*, 18(4), 893-902.

[27] Lovet, C., & Chang, R. (2005). *Understanding Chemistry*. New York: Mc Graw Hill Higher Education, 232.

[28] Pribadi, B. A. (2009). Pendekatan Kontruktivis dalam Kegiatan Pembelajaran. *Seminar Seamolec*, 11(2009), 135-152.

[29] Glasersfeld, E. (1987). *The construction of knowledge: Constributions to conceptual semantics*. Seaside, CA: Intersystems Publications.

[30] Dahar, R. W. (2011). *Teori-Teori Belajar & Pembelajaran*. Erlangga. Jakarta.

[31] Chen, W. H. (2013). Applying Problem-Based Learning Model and Creative Design to Conic-Section Teaching. *International Journal of Education and Information Technologies*, 3(7), 73-80.

[32] Mulyono, & Lestari, D. I. (2016). The Analysis Of Mathematical Literacy and Self-Efficacy Of Students In *Search*, *Solve*, *Create*, And *Share* (SSCS) Learning With A Contextual Approach. *International Conference on Mathematics, Science, and Education (ICMSE)*, 159-164.

[33] Nastiti, D., Rahardjo, S. B., Van Hayus, e. S., & Perdana, R. (2018). The Effectiveness Chemistry Module Based on Search, Solve, Create, And Share (SSCS) to Increase Generic Skill. *Proceeding International Conference on Mathematics Science Education* (*ICMScE*), 1157(2019).

[34] Burmeister, M., & Eilks, I. (2013). Using Participatory Action Research to Develop a Course Module on Education for Sustainable Development in Preservice Chemistry Education. *Center for Educational Policy Studies Journal*, 3(1), 59-78.

[35] Amsari, F. (1995). *Islam Kaaffah Tantangan Sosial dan Aplikasinya di Indonesia*. Gema Insani Press. Jakarta.

[36] Rahmat. (2004). Implementasi Nilai-nilai Islam dalam Pendidikan Lingkungan Hidup. *Kependidikan Islam*, 2(1), 23-43.

[37] Halstead, J. M. (2007). Islamic values: a distinctive framework for moral education?. *Journal of Moral Education*, 36(3), 283-296.

[38] Marijan. (2012). *Metode Pendidikan Anak*. Sabda Media. Yogyakarta.

[39] Sujiono, Y. N. (2008). *Metode Pengembangan Kognitif*. Universitas Tebuka. Jakarta.

[40] Uno, H. B. (2007). Teori Motivasi dan Pengukurannya. PT. Bumi Asara. Jakarta.

[41] Saputro, C. N. A. (2008). *Pengintegrasian Nilai-nilai Religius dalam Buku Pelajaran Kimia SMA/MA untuk Membentuk Karakter Insan Mulia pada Siswa*. UNS. Surakarta.