



Implementation of Value Education in Chemistry as an Effort to Develop Character

*Ifah Silfianah ¹, Mike Rahayu ² Bayu Saputra ³

1,2 Tadris Kimia, UIN Sayyid Ali Rahmatullah Tulungagung Jalan Major Sujadi Timur No. 46 Tulungagung 3 Pendidikan Kimia, Fakultas Keguruan dan Ilmu Pendidikan, Universitas Lampung Jalan Prof. Dr. Ir. Sumantri Brojonegoro No.1, Gedong Meneng, Kec. Rajabasa, Kota Bandar Lampung

Correspondinge-mail: if ah.silfianah@gmail.com

Received: Juli 6th, 2021 Accepted: Agustus 28th 2021 Online Published: Agustus 30th 2021

Abstract: Implementation of Value Education in Chemistry as an Effort to Develop Character. It has been indicated that there is a moral setbacks of the nation's next generation. Therefore, it is necessary to instill values to shape character through education in schools and colleges. This study aims to analyze the values of learning chemistry, find out how educators embed values in learning chemistry, and determine the obstacles faced in adding values in chemistry learning. The method in this research was descriptive qualitative using interview as data collection techniques. The subjects interviewed were six lecturers who taught chemistry at five different colleges and two chemistry teachers who taught at High Schools and Vocational High Schools. The results showed that the character values in learning chemistry can be grouped into religious values, social values, and scientific values. Chemistry teachers or lecturers instill character values by getting them used to reading scriptures before learning, presenting phenomena in daily life related to the chemistry concept, giving independent or group assignments in learning and practicum, and be a good role model. Both teachers and lecturers faced some obstacles in instilling character values in chemistry learning.

Keywords: value education, chemistry, character

Abstrak: Implementasi Pendidikan Nilai dalam Kimia Sebagai Upaya Mengembangkan Karakter. Telah terindikasi adanya kemunduran moral generasi penerus bangsa. Oleh karena itu, diperlukan penanaman nilai untuk membentuk karakter melalui pendidikan di sekolah dan perguruan tinggi. Penelitian ini bertujuan untuk menganalisis nilai-nilai karakter dalam pembelajaran kimia, mengetahui cara pendidik dalam menanamkan nilai-nilai dalam pembelajaran kimia, dan mengetahui kendala yang dihadapi dalam menamkan nilai dalam pembelajaran kimia. Metode dalam penelitian ini adalah deskriptif kualitatif dengan teknik pengumpulan data berupa wawancara. Subyek yang diwawancarai adalah enam dosen yang mengajar kimia di lima perguruan tinggi yang berbeda dan dua orang guru kimia yang mengajar di Sekolah Menengah Atas dan Sekolah Menengah Kejuruan. Hasil penelitian menunjukkan bahwa nilai-nilai karakter dalam pembelajaran kimia dapat dikelompokkan menjadi nilai religius, nilai sosial, dan nilai ilmiah. Guru ataupun dosen kimia menanamkan nilai karakter dengan membiasakan membaca kitab suci sebelum pembelajaran, dengan menyajikan fenomena dalam kehidupan sehari-hari yang berkaitan dengan konsep kimia, memberikan tugas mandiri ataupun kelompok dalam pembelajaran maupun praktikum, dan memberikan teladan yang baik. Guru maupun dosen sama-sama mengalami beberapa kendala dalam menanamkan nilai-niai karakter dalam pembelajaran kimia.

Kata kunci : pendidikan nilai, kimia, karakter

INTRODUCTION

One of the founding fathers of the nation who was also the first president of the Republic of Indonesia, Ir. Soekarno emphasized that the development of this nation must be begin with character building. With character development, a great, advanced, victorious, and dignified nation will be achieved (Samani & Hariyanto, 2013). Character development is very important for children and adolescents. This process can be the basis for increasing self-competence, self-confidence, peer relations and caring (Lerner, 2018). These abilities will contribute positively to their lives in the future, both in their families, schools and communities, nation and state. However, in recent years Indonesia has experienced multidimensional crises such as the many practices of Corruption, Collusion and Nepotism (KKN), conflicts, increased crime, decreased work ethic, and others (Megawangi, 2004).

On the other hand, indications of the moral decline of young people arise from several behaviors such as theft, brawls between students, violence, anarchic and cheating behavior, disregard for rules, intolerance, use of bad language, premature sexual maturity and deviations (Lickona, 2013). Indications of the moral decline of young people have already occurred in Indonesia as reported in various media. The Central Bureau of Statistics. Badan Pusat Statistik, (2010) recorded as many as 200 teenagers who committed criminal acts, 60 percent of which were in the form of theft, 9.5% of drug abuse, 6% of rape or obscenity, 4% of beatings, and the rest were murder, possession of sharp weapons, extortion, embezzlement and other crimes. There are still many other cases, such as free sex, brawls between students, and others. Especially in the current era of the industrial revolution 4.0, students can easily access information through the digital world. Incoming information, good or bad, will easily affect the character of children

In case avoid the cases getting worse, character building is absolutely necessary. The Governmen of Indonesia has issued Presidential Regulation number 87 of 2017 about strengthenin character education (Peraturan Presiden Nomor 87 Tahun 2017 Tentang Penguatan Pendidikan Karakter, 2017). Article 7 paragraph 1 implies that character strengthening activities can be internalized in learning materials, learning methods in accordance with curriculum content. The character building can be done through the education of the younger generation to form a generation of character so that they can form a great, advanced, and dignified nation .

Character building can be started from the family environment from an early age both through family and education at school (Gunawan, 2017). This is because the educational environment is very influential in character education (Ramdhani, 2014). The existence of character education in schools can affect student achievement. Character education in schools has a positive relationship with student academic achievement. Schools that implement character education tend to have students with high academic scores (Benninga et al., 2003). Character education in schools affects learning outcomes (Goss & Holt, 2014; Jeynes, 2019; Kurniasari et al., 2018; Snyder, 2011), attitudes/behavior (Goss & Holt, 2014; Halawati, 2020; Jeynes, 2019), discipline (Goss & Holt, 2014; Snyder, 2011), self-concept (Riko et al., 2019), academic quality (Mailani et al., 2019), self-development (Fajri et al., 2020) of students.

As educational institutions, schools should emphasize the value in education in every subject. Both integration in planning, process, and in the evaluation of learning. One of the materials taught at the high school level is chemistry. Therefore, it is necessary to integrate values in chemistry through the curriculum, learning process, and chemistry teaching materials used. Seeing the importance of efforts to cultivate character through the learning process, it is very necessary to research to find out the character values that can be instilled through chemistry learning, find out the ways and constraints of lecturers and teachers as educators in instilling character values in students and students in learning chemistry.

METHOD

The method used in this research is descriptive qualitative. The subjects involved in this study were six chemistry lecturers from five universities who teach different subjects and two teachers who teach at Senior High Schools (SMA) and Vocational High Schools (SMK). Data collection techniques using structured interviews. The results of the interview are then processed descriptively.

RESULT AND DISCUSSION

The research results are presented based on the theme of the questions asked, namely:

Are character values embedded in the learning process?

The results of interviews with lecturers showed that all lecturers stated that character values could be instilled in chemistry learning. The values that can be instilled in chemistry learning are the values of honesty, discipline, cooperation, independence, democracy, independence, religion, responsibility, never giving up, caring, time management skills, love for the homeland, optimism and hard work. Teachers who teach chemistry in SMA and SMK also agree that character values can be instilled through chemistry learning. These values include religious, honest, tolerance, discipline, hard work, creative, independent, democratic, curiosity, love for the homeland, respect for achievement, communicative, love to read, care for the environment, and care about social.

How to instill character values in the learning process?

Religious values in students can also be instilled by reading 3-5 verses before the lecture begins. The teacher also believes that religious values can be instilled through prayer together at the beginning and at the end of the lesson. The tough value (never give up) can be trained in practicum activities, which is to keep repeating the practicum if the experiment fails. The value of cooperation can be trained by giving group assignments. Responsible attitude towards assigned tasks, for example collecting presentation files in the form of powerpoint media according to the agreed time. If you don't collect, you won't be allowed to present.

Student curiosity can be formed by does not provide materials at the beginning but by providing phenomena related to everyday life related to the material. For example, in a microbiology course, students are presented with a video on how to isolate DNA and then asked to analyze it. In the computer fundamentals course in chemistry, students analyze molecular structures and elaborate new problems. In the chemistry charm course, independent values can be instilled in finding a problem faced by chemistry teachers. A democratic attitude can be obtained from group activities in solving problems. The value of caring for fellow human beings can be demonstrated by various information related to the benefits of chemicals and tackling or minimizing the negative impacts of chemicals. Caring for the environment can be trained in practical activities. One of the chemistry majors asked students to model a good laboratory from planning to waste management. Thus, it is expected that students can have an attitude of caring for the environment by treating waste first so it does not harm the environment.

According to one of the lecturers, forming a good student character by making the lecturer a role model for students, both in attitude, speech and appearance. By giving an example, it is hoped that students can follow the positive side of the lecturer. Character values can be instilled in students by not only emphasizing academic values but also appreciating every effort made by students. This can be done by giving praise to students who are on time, diligent in doing assignments, or showing a good attitude while on campus. If these habits often do by students, they will be able to improve their character, especially better confident and be a hard worker. This is in line with the teacher's opinion which states that the value of appreciating achievement can be instilled by giving rewards or awards to students with the best test scores/tests.

Inserting moral values in the student learning process can be done during the Physical Chemistry course. Lecturers not only give formulas and ways of working to students but can also teach the value of life such as being patient and trying to solve a problem by sharpening logical thinking in working on physical chemistry problems. Thus, when students always think positively in dealing with any problem, they will believe that every problem has a way out. Lecturers also provide opportunities to learn leading and cooperating in group assignments. Lecturers ensure that each member has the opportunity to lead and work together to do the task.

According to the chemistry teacher who teaches in high school, the values of honesty, discipline, curiosity can be implicitly instilled when doing practicum. In conducting experiments, we must obey the experimental procedure step by step (disciplined and honest), then in each step it allows students to curious what happened or why it should be treated this way (curiosity). The value of curiosity and love of reading can also be applied in every learning meeting, especially by using a constructivist/K-13 learning approach.

Values of honesty, discipline, hard work, and independence can be instilled in doing independent tests and assignments. We can instill the values of tolerance, democracy, creativity, and communicativeness in group assignments and presentations, for example during the process of working in groups we must respect the opinions of all members and all members must participate in working on and contribute ideas (tolerance and democracy) and all members actively convey group results through presentation (communicative) and respecting questions/refutation of other groups (tolerance), as well as an assessment of powerpoint presentations that can demand student creativity and others.

Instilling value in chemistry learning is not only done with certain strategies, techniques, or learning models, but by inserting values into the material. All lecturers and teachers stated that they could teach character values based on chemical materials. Lecturers who teach bioinorganic instill religious values by showing the majesty of God regarding the existence of organometallic complexes in living things. The existence of a structure, function that is so complex and different for every living thing. Another example when studying essential elements. Elements that are very small and few but have a big impact. This can teach students to respect each other.

Respondents from lecturers who teach basic chemistry courses instill a religious value to be grateful when studying hydrogen bonds or the physical properties of matter.

The presence of hydrogen bonds in water should be grateful because if there were no hydrogen bonds we might not find water at room temperature. Furthermore, in studying the physical properties of matter such as density. If God created oxygen density lower than hydrogen and nitrogen and even carbon dioxide, we would not find oxygen on the earth's surface.

Meanwhile, chemistry teachers at SMK instill religious values, for example when learning about elements. Students explained that iron is an element mentioned in the Qur'an. Chemistry teachers in high school instill the value of religious character when studying materials, one of which is intermolecular forces. Students are invited to be grateful that we can bathe and drink water because of the hydrogen bonds in water molecules.

The chemistry teacher at the high school stated that the value of love for the homeland was instilled in elemental chemistry by giving various examples of the types of minerals that are widely available in Indonesia. Caring for the environment can be instilled when studying the hydrocarbon chapter on the results of burning vehicle fuels, the polymer chapter on the dangers of plastics to the environment, the elemental chemistry chapter on the carbon cycle, nitrogen, waste related to environmental pollution.

The value of social care can be instilled, such as when studying additives and addictive substances, namely by making posters that can be affixed in the school environment and the community about the dangers of additives and addictive substances to health, the value of social care can also be instilled by establishing a tutor system for students whose grades are good. to help friends who do not understand.

Based on the answers of the lecturers and teachers to the first and second questions, the character values that are instilled through chemistry learning can be grouped as figure 1 below:



Figure 1. Value Character Through Chemistry Learning

Religious values, with the facts contained in chemistry, students can be invited to realize the greatness of God and be grateful. Social attitudes, such as working together, caring for the environment, being friendly, democratic, and caring for others. Scientific values consisting of curiosity, creative, critical, confident, tolerant, independent, optimistic, honest, responsible, disciplined, and hard working, communicative, fond of reading, never give up, and time management skills.

Based on several studies, the values that emerge in chemistry learning include: active, cooperative, curious, responsible, critical, democratic, and confident (Surbakti & Supartono, 2016). Islamic values contained in hydrocarbon materials include dhikr,

maintaining friendship, fond of giving alms, wise and fair, improving themselves, sincerely helping, patient and surrendering (Asmara, 2016).

Values in chemistry are obtained based on the characteristics of chemistry which is a subject in high school and college subjects. As is known, chemistry studies the structure, composition, properties, and changes of a substance. Chemistry basically has four elements, namely product, process, application, and attitude. Chemistry is a process of discovery, not just facts, concepts, or principles.

These values should be applied in the curriculum, learning, and chemistry teaching materials. Value education is needed to form good character. Character can be formed from the habituation of good values that are often done. Character education is defined by (Megawangi, 2004) as an effort to educate children in making wise decisions and applying them in everyday life, as well as contributing positively to their environment. The values that are instilled should be general values that are recognized by all culture, religion, and tradition so that they can become glue for all nations with different backgrounds. Thus, character education cannot be taught in theory or knowledge, but a habituation process is needed so that students become trained to apply it and have good self-emotions. According to (Lickona, 2013) there are three good components that influence each other, namely moral knowledge, moral feelings, and moral actions. With the knowledge, feelings, and habits to do good values in learning at school, good character will also be formed.

The results of the study show how teachers or chemistry lecturers instill character values by getting used to reading the holy book before lectures, by providing phenomena in everyday life related to the material. In addition, it can be done by giving group assignments in lectures and practicums. Not only in groups, students can also be given independent tests or assignments. It is no less important is to set a good example.

The ways that teachers and lecturers instill values in learning are a form of character education. Learning in character education is defined by Kesuma et al., (2011) as learning that leads to the strengthening and development of children's behavior as a whole based on a value. Integrating character education in learning can be done by introducing values, providing awareness of the importance of values, and their application to student behavior (Asmani, 2012). application in learning can be done in all subjects both inside and outside the classroom.

It is also possible to cultivate character through learning methods. Research conducted by (Surbakti & Supartono, 2016) shows that learning chemistry with the discussion method can bring out the character of students. In chemistry lectures, character education can be implemented which includes attitudes of responsibility, cooperation, discipline, manners, activeness, and self-confidence (Cahyaningsih et al., 2021).

From the explanation above, it can be concluded that character building can be done through the internalization of values in chemistry learning. In this case, chemistry teachers and lecturers play an important role in planning, implementing, and evaluating value-integrated learning because many values are instilled through chemistry learning. This is in line with the opinion of Allchin (1999) which states that teachers should ideally assist students in various ways to apply values in science and help them develop the ability to see their differences and in analyzing the role of values in rigorous fact-finding. In the learning process the teacher acts as a model. The development of children's ability to think rationally about moral issues is an important task for teachers (Fraenkel, 1977). Students must develop intellectual and emotional abilities if they are to become psychologically fully human.

What are the obstacles faced in instilling values during the learning process?

In instilling character values, lecturers and teachers as educators get several obstacles and obstacles, including: (1) difficulty in finding references in integrating chemical concepts with the concept of value to be given, (2) not all students and students can be directed according to the instructions of the lecturer, so that their character values are lacking, for example, they are often late in submitting assignments, (3) It takes a long time to form a character, (4) students are still less confident, indifferent, and only selfish, (5) not all materials can be integrated with character values, so it is difficult to embed the values contained in the material, for example for compound synthesis materials it is difficult to measure the character value, the parameter cannot be done yet, (6) students sometimes focus too much on academic values and understanding of learning simply because the material presented is quite difficult for them to understand, so it is difficult to insert character planting, (7) character values developed in learning have not been described in representative indicators, causing difficulties for teachers in measuring their achievements, (8) Both teachers and lecturers have an incomplete understanding of character education, so they have limitations in integrating character values into effective courses, and (9) must think about the relationship between chemical materials and life to instill character values such as religious, patriotism, environmental care, and social care.

Some of the obstacles that arise in instilling character in chemistry learning are related to students, supporting facilities, difficulties in designing material content and the inability of educators to integrate these values. Therefore, character education is not only the responsibility of educators such as teachers and lecturers, but all elements must be involved. One of them is the government as a policy maker in creating a curriculum that is used by teachers as a reference in preparing lesson plans. Based on the results of the study, several basic obstacles faced by teachers in implementing the chemistry curriculum include mastery of materials, tests and exams, time constraints, student learning resources, teacher reference materials, number of students, beliefs about science, and peer tutors (Chen & Wei, 2015).

The following are the recommendations of researchers in applying forms of value integration that can be applied in overall chemistry learning

1. Integrating Values Education in Chemistry Curriculum

The government has made efforts to integrate values into the curriculum, written in (Peraturan Menteri Pendidikan Dan Kebudayaan Republik Indonesia Nomor 54 Tentang Standar Kompetensi Lulusan Pendidikan Dasar Dan Menengah, 2013) stating the competence of graduates in the dimensions of attitudes, knowledge, and skills. In the government regulation it can be seen that the character of students wants to be formed through the curriculum through graduate competency standards in the dimension of attitude. In addition, from the knowledge dimension, it can be seen that the character of students who want to be formed are intelligent, insightful, and love the homeland. In the dimension of skills, the character of students who want to be formed are include critical thinking, creative, hardworking, and love reading.

The integration of values in the chemistry curriculum can be seen in (Permen No 64 Tahun 2014 Tentang Peminatan Pada Pendidikan Menengah, 2014) on chemical content. These competencies include (1) growing faith in God Almighty through

observation of chemical phenomena and principles, (2) developing scientific attitudes (curiosity, logical and analytical thinking, diligent, tenacious, honest, disciplined, responsible, polite and care through chemistry, (3) understand and apply chemical theory to explain related phenomena, (4) design and conduct chemical experiments which include formulating problems, proposing hypotheses, determining variables, selecting instruments, collecting, processing and analyzing data, drawing conclusions, and communicating experimental results orally and in writing, (5) analyzing and solving problems related to chemistry and applying chemical knowledge in various fields of science and technology. These competencies are then set forth in Core Competencies (KI) for chemistry subjects to facilitate the operational implementation of the Standard Contents.

2. Integrating Values Education in Chemistry Learning

The following explanation is about how to integrate values in chemistry learning in planning activities, learning processes and evaluations.

a. Lesson planning

The process of preparing learning plans refers to (Regulation of the Minister of Education and Culture Number 22 of 2016 concerning Standards for Primary and Secondary Education Processes, 2016). In this regulation, there are 13 components that must be present in the preparation of learning tools. However, currently, there is (Circular Letter Number 14 of 2019 concerning Simplification of Learning Implementation Plans, 2019) that the preparation of RPP can be simplified. In preparing the lesson plans, there are three core components, namely learning objectives, learning steps, and learning assessments. The other ten components are used as complements.

In developing lesson plans, teachers must think of ways to integrate values into their lesson plans. The development of these values in learning planning is pursued in the following ways : (1) assessing Core Competencies (KI) and Basic Competencies (KD) to determine the content of values, (2) assessing the values contained in each learning material, (3) include the assessed value in the RPP.

b. Learning process

The values contained in chemistry must be integrated in the learning process by using various models or varied learning methods. Research conducted by (Surbakti & Supartono, 2016) shows that information technology-based chemistry learning using the discussion method can bring out students' character. Other studies have shown that certain learning models can improve students' character. Such as research (Ramadhani et al., 2021) which shows that POGIL learning on buffer solution material can increase students' confidence. The results of the study (Pitaloka et al., 2020) showed that learning with the guided inquiry model on acid-base material was able to increase students' self-efficacy. The STAD type of cooperative learning model has an effect on students' social attitudes (Marheni et al., 2020). Learning analytical chemistry with a demonstration-based cooperative model can improve the character of students' hard work and responsibility (Mutiah et al., 2021). In this regard, Barnawi & Arifin, (2012) state that the values in each subject can be applied in learning activities ranging from exploration, elaboration, to confirmation (Barnawi & Arifin, 2012) states that the values in each subject can be applied in learning activities ranging from exploration, elaboration, to confirmation c. Assessment of Student Character in Learning

Assessment is an important part of learning. As expressed by (McMillan, 2000). that assessment is a process of collecting data for decision making. So, by conducting

learning assessments, teachers can find out the students' initial achievements and determine how to learn the right way. During the learning process, the teacher can know the development of students' abilities so that they can determine the success of teaching methods. After learning, the teacher can determine the students' abilities so that the teacher can determine whether students can continue to the next material and can determine which students need remedial or enrichment.

Assessment of student character can be done using attitude assessment techniques and instruments that have been set by the government in the curriculum.. (Peraturan Menteri Pendidikan Dan Kebudayaan Republik Indonesia Nomor 23 Tahun 2016 Tentang Standar Penilaian Pendidikan, 2016) The techniques and instruments for assessing attitude competence are as follows: (1) Techniques: Observation, self-assessment, "peer" assessment, and journal, (2) Instruments (assessment tools) such as checklists or rating scales for observation, self-assessment, assessment among students, and educator notes in journals

Teachers can use assessment techniques that are in accordance with the material or learning model. If you use questions, the questions developed can be filled with value so that they can shape the character of students. Research shows that the questionnaire instrument developed by integrating religious character values is effective for measuring the religious character of students (Ningrum & Supardi, 2020). In addition, research conducted by (Sulastri et al., 2018) developed chemistry questions containing values. The values developed include intellectual, spiritual, ethical, aesthetic, social, and economic values. The results of the research conducted indicate that the questions developed are feasible to use.

3. Integration of Value Education in Teaching Materials

In the preparation of chemistry teaching materials for students, it is necessary to integrate the values in these teaching materials so that students can learn the values in chemistry independently. According to (Anwar, 2014) one of the stages in developing teaching materials is to find sources and examine values that are in accordance with the scope of the study of material required in basic competencies. This value must be the core of the material being taught either philosophically, integrating, or contradicting. Research on chemical teaching materials with character is carried out by (Singarimbun et al., 2015; Situmorang, 2013). The results showed that innovative chemistry teaching materials could improve learning outcomes and develop students' character.

CONCLUSION

Character education of students can be formed through internalization of values in chemistry, both in curriculum, learning process, or chemistry teaching materials. The values that can be instilled through chemistry are religious values, scientific values, and social values. The ways chemistry teachers and lecturers on instilling character values by getting used to reading scriptures before learning, presenting phenomena in daily life related to the chemistry concept, giving independent or group assignments in learning and practicum, and setting a good role model. Teachers and lecturers experience several obstacles in integrating value education into chemistry. However, teachers and lecturers always try to shape the character of students in learning chemistry in schools and universities. The responsibility for forming students' character is not only the responsibility of teachers and schools, but all elements such as parents, society, media, and government. Therefore, all these elements must be involved in forming good student character.

REFERENCES

- Allchin, D. (1999). Values in science: An educational perspective. *Science and Education*, 8(1), 1–12. https://doi.org/10.1023/A:1008600230536
- Anwar, S. (2014). *Bahan Perkuliahan: Pengolahan Bahan Ajar*. Bandung : Universitas Pendidikan Indonesia.
- Asmani, J. M. (2012). Buku Panduan Internalisasi Pendidikan Karakter di Sekolah. Jogjakarta : Diva Press.
- Asmara, A. P. (2016). Kajian Integrasi Nilai-Nilai Karakter Islami dengan Kimia dalam Materi Kimia Karbon. *Jurnal Pendidikan Sains*, 04(2), 1–11.
- Barnawi, & Arifin, M. (2012). *Strategi & Kebijakan Pembelajaran Pendidikan Karakter* (M. Sandra (ed.)). Jogjakarta : Ar-Ruzz Media.
- Benninga, J., Berkowitz, M., Kuehn, P., & Smith, K. (2003). The Relationship of Character Education Implementation and Academic Achievement in Elementary Schools. *Journal of Character Education*, 1(1), 19.
- Cahyaningsih, K. A., Pratiwi, N. A., Widiyanto, W., Aji, L. S., Laili, M., & Zamhari, M. (2021). Penerapan Pendidikan Karakter oleh Mahasiswa Pendidikan Kimia UIN Sunan Kalijaga. *Chemistry Education Practice*, 4(1), 98–105. https://doi.org/10.29303/cep.v4i1.2276
- Chen, B., & Wei, B. (2015). Investigating The Factors That Influence Chemistry Teachers' Use of Curriculum Materials: The case of China. *Science Education International*, 26(2), 195–216.
- Fajri, F. N. Al, Hartono, R., & Hakim, L. (2020). Pengaruh Pendidikan Karakter Terhadap Pengembangan Diri pada Siswa di SMPN 1 Sumbawa Besar. *Jurnal Psimawa*, *3*(1). http://www.jurnal.uts.ac.id/index.php/PSIMAWA/article/view/605
- Fraenkel, J. R. (1977). *How to Teach About Values Approach*. New Jersey : Prentice-Hall.
- Goss, S., & Holt, C. (2014). Perceived Impact of a Character Education Program at a Midwest Rural Middle School: A Case Study. *Education Leadership Review of Doctoral Research*, 1(2), 49–64.
- Gunawan, R. (2017). The Role of Character Education for Early Children in Early Childhood Education Programs in Happy Kids Bogor Indonesia. Advances in Social Science, Education and Humanities Research (ASSEHR), 66(Yicemap), 23–26. https://doi.org/10.2991/yicemap-17.2017.5
- Halawati, F. (2020). Pengaruh Pendidikan Karakter Terhadap Perilaku Siswa. *Education and Human Development Journal*, *5*(2), 51–60. https://doi.org/10.33086/ehdj.v5i2.1561
- Jeynes, W. H. (2019). A Meta-Analysis on the Relationship Between Character Education and Student Achievement and Behavioral Outcomes. *Education and Urban Society*, *51*(1), 33–71. https://doi.org/10.1177/0013124517747681
- Kesuma, D., Triatna, C., & Permana, J. (2011). *Pendidikan Karakter: Kajian Teori dan Praktik di Sekolah*. Bandung : Remaja Rosdakarya.
- Kurniasari, M. F., Hari, M., & Kusdiyanti, H. (2018). The Influence of IT-based Information and Character Education Utilization in Schools Towards the Learning Outcome of Tenth Graders from the Business and Management Class in Smk Pgri

Turen. *KnE Social Sciences*, 3(3), 167. https://doi.org/10.18502/kss.v3i3.1882

- Lerner, R. M. (2018). Character Development Among Youth: Linking Lives in Time and Place. International Journal of Behavioral Development, 42(2), 267–277. https://doi.org/10.1177/0165025417711057
- Lickona, T. (2013). Educating For Character. Jakarta : Bumi Aksara.
- Mailani, I., Pendidikan, P., Islam, A., Islam, U., & Singingi, K. (2019). Pengaruh Pendidikan Karakter Terhadap Mutu Akademik Siswa Di Ma Syafa ' Aturrasul Beringin Batu. Al-Hikmah : Jurnal Pendiidkan dan Pendidikan Agama Islam, 1(2), 88–96.
- Marheni, N. K., Jampel, I. N., & Suwatra, I. I. W. (2020). Model STAD Berpengaruh terhadap Sikap Sosial dan Hasil Belajar IPA. *Jurnal Penelitian Dan Pengembangan Pendidikan*, 4(3), 351–361.
- McMillan, J. H. (2000). Essential Assessment Concepts for Teachers and Administrators (Experts In Assessment Series). Thousand Oaks : Corwin Press, Inc.
- Megawangi, R. (2004). Pendidikan Karakter. Bandung : Pustaka Mizan.
- Mutiah, M., Sukib, S., Junaidi, E., & Anwar, Y. A. S. (2021). Pembelajaran Kooperatif Berbasis Demonstrasi Kimia Yang Dimodifikasi Sebagai Model Perkuliahan Kimia Analitik Berkarakter. *Chemistry Education Practice*, 2(1), 66–71. https://doi.org/10.29303/cep.v4i1.2244
- Ningrum, L. S., & Supardi, K. I. (2020). Pengembangan Karakter Religius Peserta Didik Melalui Pembelajaran Kimia Materi Hidrokarbon Smk. *Jurnal Inovasi Pendidikan Kimia*, 14(1), 2490–2497.
- Peraturan Presiden Nomor 87 Tahun 2017 Tentang Penguatan Pendidikan Karakter, 6 September 2017 (2017). https://setkab.go.id/inilah-materi-perpres-no-87-tahun-2017-tentang-penguatan-pendidikan-karakter/
- Peraturan Menteri Pendidikan Dan Kebudayaan Nomor 22 Tahun 2016 Tentang Standar Proses Pendidikan Dasar Dan Menengah, (2016).
- Peraturan Menteri Pendidikan dan Kebudayaan Republik Indonesia Nomor 23 Tahun 2016 Tentang Standar Penilaian Pendidikan, (2016). https://doi.org/10.31227/osf.io/munp2
- Peraturan Menteri Pendidikan Dan Kebudayaan Republik Indonesia Nomor 54 Tentang Standar Kompetensi Lulusan Pendidikan Dasar Dan Menengah, Lembaran Negara RI (2013).
- Permen No 64 Tahun 2014 Tentang Peminatan Pada Pendidikan Menengah, Menteri Pendidikan dan Kebudayaan Republik Indonesia (2014).
- Pitaloka, H. V, Sofya, E., & Efkar, T. (2020). The Effectiveness of Guided Inquiry Learning Model to Improve Science Literacy Skills and Students Self Efficacy on AcidBase Materials. *Jurnal Pendidikan Dan Pembelajaran Kimia*, 9(3), 139–152. https://doi.org/10.23960/jppk.v9.i3.202013
- Ramadhani, N., Rudibyani, R. B., Efkar, T., & Saputra, B. (2021). The Effectiveness of POGIL Model to Increase Self Confidence and Mastery of Students' Buffer Solution Concept. Jurnal Pendidikan Dan Pembelajaran Kimia, 10(1), 101–112. https://doi.org/10.23960/jppk.v10.i1.April
- Ramdhani, M. A. (2014). Lingkungan Pendidikan dalam Implementasi Pendidikan Karakter. Jurnal Pendidikan Universitas Garut, 8(1), 28–37.
- Riko, R., Lestari, F. A. P., & Lestari, I. D. (2019). Pengaruh Pendidikan Karakter terhadap Konsep Diri Peserta Didik. *SAP (Susunan Artikel Pendidikan)*, 4(2). https://doi.org/10.30998/sap.v4i2.4448

- Samani, Muchlas, & Hariyanto. (2013). Konsep dan Model Pendidikan Karakter. Bandung : Remaja Rosdakarya.
- Singarimbun, E., Silaban, R., Suyanti, R. D., & Siti, I. (2015). Pengembangan Bahan Ajar Kimia Inovatif pada Pokok Bahasan Reduksi dan Oksidasi Berdasarkan Kurikulum 2013 Terintegrasi Pendidikan Karakter. Jurnal Pendidikan Kimia Universitas Negeri Medan, 7(2), 13–20.
- Situmorang, M. (2013). Pengembangan Buku Ajar Kimia SMA melalui Inovasi Pembelajaran dan Integrasi Pendidikan Karakter untuk Meningkatkan Hasil Belajar Siswa. *Semirata FMIPA Universitas Lampung*, 1(1), 237–246.
- Snyder, F. (2011). Impact of the Positive Action program on school-level indicators of academic achievement, absenteeism, and disciplinary outcomes: A matched-pair, cluster randomized, controlled trial. J Res Educ Ef, 3(1), 26–55. https://doi.org/10.1080/19345740903353436.Impact
- Statistik, B. P. (2010). Profil Kriminalitas Remaja 2010: Studi di Lembaga Pemasyarakatan (LAPAS) Anak di Palembang, Tangerang, Kutoarjo, dan Blitar.
- Sulastri, S., Rusman, R., & Arifa, A. (2018). Pengembangan Soal-Soal Kimia Bermuatan Nilai-Nilai Untuk Memperkokoh Karakter Siswa Sma. JTK (Jurnal Tadris Kimiya), 3(2), 171–181. https://doi.org/10.15575/jtk.v3i2.3512
- Surat Edaran Nomor 14 tahun 2019 tentang Penyederhanaan Rencana Pelaksanaan Pembelajaran, (2019).
- Surbakti, D. A., & Supartono. (2016). Pengembangan Karakter Siswa Pada Pembelajaran Kimia Berbasis Teknologi Informasi Menggunakan Metode Diskusi. Jurnal Inovasi Pendidikan Kimia, 10(2), 1807–1815.