Al-Ishlah: Jurnal Pendidikan
Vol.15, 4 (December, 2023), pp. 5384-5394
ISSN: 2087-9490 EISSN: 2597-940X, DOI: 10.35445/alishlah.v15i4.2725

The Potential of RQANI for Shaping Preservice Biology Teachers' Character at Islamic University

Astuti Muh.Amin[1]

[1] Institut Agama Islam Negeri Ternate, Ternate, Indonesia; astutimuhamin@iain-ternate.ac.id

ARTICLE INFO

Keywords:

RQANI;
learning model;
character

Article history:

Received 2022-09-03
Revised 2022-12-10
Accepted 2023-11-13

ABSTRACT

It is essential to support students' character development as part of the learning process to prepare the next generation for global challenges. This study aimed to determine the impact of the RQANI model on the character of biology students. This quasi-experimental study employed a nonequivalent control group design. The research population was all biology education students in the City of Ternate, North Maluku, Indonesia. The research sample consisted of 120 students from the biology education department at IAIN Ternate and STIKIP Kie Raha located in the City of Ternate. Participants' character was assessed using a valid and reliable instrument. Data analysis was performed using ANACOVA at 5% significance level. The analysis results showed that the RQANI model had a positive impact on students' character. This study's findings are expected to benefit lecturers and teachers in their efforts to improve the character of students and the quality of learning in the classroom.

Corresponding Author:
Astuti Muh.Amin
Institut Agama Islam Negeri Ternate, Ternate, Indonesia; astutimuhamin@iain-ternate.ac.id

1. INTRODUCTION

Character development is the most important factor in preparing a generation to face the challenges of the twenty-first century (Sari et al., 2013). The primary aim of education is to develop the overall personality of students by changing their behavior, character, and attitudes, from negative to positive, from destructive to constructive, from bad to noble, as well as helping students maintain the good morals that they have been carrying (Purnama et al., 2019). Character development during the learning process is important in order to improve students' cognitive abilities and skills. Character education is held to shape and develop students' mindsets, attitudes, and behavior so that they can become good individuals with positive attitudes, polite behavior, a noble spirit, and great responsibilities (Bahri et al., 2021).

Following the informal family education, character formation and habituation becomes the duty of official educational institutions (Dimyati, 2018). The incorporation of character values into biology instruction in higher education is anticipated to provide a new dimension to the learning process, requiring students to possess not only the ability to think, but also good character values, particularly nationalism (Hadi et al., 2018). The application of character education with care and excellence will produce a generation of ethical and accountable people (Berkowitz & Bier, 2005).

The reality and the current phenomenon is that the Indonesian nation is experiencing a decline in the moral values of conflicts such as violence, sexual abuse, a culture of lies, juvenile delinquency, and corruption (Octavia & Rube'i, 2017). The current moral crisis is also seen in the increase in promiscuity, violence, crimes against friends, brawls, cheating habits, drug abuse, pornography which has now

become a social problem that has not been completely resolved (Susilowati, 2017). The decline in character continues to occur and creates a character crisis in students (Taib & Masri, 2020). Religious values, discipline, responsibility have not been able to be fully integrated in the lecture process and practicum activities (Ridlo & Irsadi, 2012). Character building in the world of campuses, especially in universities, is motivated by the rise of irregularities that occur in the public sphere. Value disorientation and disharmony at the level of community life are often found. From a social perspective, the culture of shame is slowly disappearing, not respecting other people until the emergence of violence in the midst of people's lives (Choli, 2020). Moral decadence and bad character shown by students are examples of an inseparable part in the world of education. In addition to violent behavior, issues of morality among teenagers such as the use of narcotics, pornography, student brawls, free sex, abortion, rape, looting, theft, murder, and other immoral acts, have become social problems that until now have not been resolved. completely (Setyaningrum & Husamah, 2011).

The learning process must involve interaction between educators and students in a democratic way. It is a challenge for educators to build the optimal learning model in the classroom in order to fulfill learning objectives (Jatmoko et al., 2021). The development of a character education-focused biology learning model is one way to aid educators in creating, implementing, and assessing character education enhancements (Jamaluddin et al., 2022). To build character qualities through learning, educators must be creative in their packaging. Learning should leave an impression on students' hearts, not be dull, and elicit an active response during the process (Dwiyanti & Sumarmin, 2020). Teachers must be able to improve the quality of learning in the classroom, as demonstrated by increased student achievement and positive behavior (Hadi et al., 2022).

Educators are expected to implement pedagogical innovation so that classroom learning can satisfy the learning requirements of the twenty-first century. To facilitate character-based learning, teachers must have sufficient pedagogical skills (class management, provision of guidance, questioning techniques, and feedback) and literacy skills (Hadi et al., 2022). Creating biology classroom that can help shape student character is not easy. This necessitates the use of learning models and techniques that correspond to the themes and character values to be taught (Handoyo & Listyarini, 2018; Nuartin & Aminatun, 2019). To generate students with 21st century abilities and life skills, educators must be able to implement character-based learning that is interwoven with sustainable local wisdom (Irwansyah et al., 2020).

Character is a category of affective learning outcomes. This is a matter that Indonesian education must likewise tackle (Irwandi et al., 2022). To enhance the moral calibre of future generations, it is imperative to impart positive values to kids through character education (Astuti et al., 2020; Pratama et al., 2020). The character values that require enhancement encompass religious beliefs, honesty, discipline, industriousness, creativity, autonomy, friendship or communicativeness, serenity, compassion, and sense of responsibility (Yanzi, 2019; Zurqoni et al., 2018). The emergence of integrated learning designs presents a remarkable chance to cultivate students' virtuous character (Nihayati, 2017).

RQANI is an educational paradigm that aims to actively include students in the learning process by combining scientific principles with the sacred verses of the Quran and Al-Hadith (Amin et al., 2022). The stages of RQANI have the potential to enhance the personal qualities of students, especially those who have ambitions of pursuing a career as biology educators. Presently, there is a scarcity of research investigating the impact of learning models on the character development of biology students. Hence, the research inquiry centres on the influence of the RQANI model on the disposition of biology students. The objective of this study was to assess the influence of the RQANI model on the disposition of biology students. This research aims to enhance the nation's education system by developing an integrated learning strategy for biology lectures.

2. METHODS

The utilised research methodology is quantitative research. The research employed a quasi-experimental design with a nonequivalent control group, as outlined by Sugiyono (2012). The research

population comprised all biology education students hailing from the City of Ternate, located in North Maluku, Indonesia. The study sample comprised 120 students enrolled in the Department of Biology Education at IAIN Ternate and STIKIP Kie Raha, located in the city of Ternate, North Maluku. The investigation was carried out throughout the first semester of the 2020/2021 academic year, commencing in August 2020 and concluding in February 2021. Before commencing the experiment, a homogeneity test was performed on the sample to verify that all individuals have an equivalent degree of academic aptitude. The research participants were categorised into two treatment groups. Subsequently, a pretest and post-test were administered to each of the groups. One group was provided with instruction utilising RQANI, whilst the other group did not receive such teaching. The research design is displayed in Table 1.

Table 1. Research Design

No	Group	Pretest	Treatment	Post-test
1	E	O_1	X	O_2
2	K	O_3	-	O_4

Remarks
E : Experimental group, who studied using RQANI
K : Control group, who studied without RQANI
O_1 : Pretest to the experimental group
O_2 : Posttest to the experimental group
O_3 : Pretest to the control group
O_4 : Posttest to the control group
X : RQANI implementation (the research treatment)

The experimental group learned using RQANI. In RQANI, learning is divided into several phases, namely Reading, Questioning, Answering, Elaboration, and Integration (Amin et al., 2022). The learning activities conducted at each phase of RQANI are detailed in Table 2.

Table 2. RQANI Learning Syntax

Syntax	Learning Activities	
	Lecturer	**Students**
Phase 1 *Reading*	1. Provide learning motivation to students. 2. Deliver learning objectives to students. 3. Provide opportunities for students to read literature related to the material to be discussed.	1. Listen to the learning motivation by the lecturer. 2. Listen and take notes on the lecturer's presentation of the learning objectives. 3. Read literature related to the material to be discussed.
Phase 2 *Questioning*	Provide opportunities for students to formulate and ask questions concerning the lecture material.	Create and ask questions about the lecture material.
Phase 3 *Answering*	Provide opportunities for students to respond to lecture-related questions.	Effectively respond to questions pertaining to the lecture material.
Phase 4 *Elaboration*	Facilitate students' ability to work in groups to comprehend previously studied material, engage in dialogues and discussions with their group groupmates about material that is difficult to comprehend, and solve everyday problems.	Collaborate in groups to comprehend the material that has been studied, engage in dialogue and discussion with teammates about difficult material, and solve everyday problems.

Syntax	Learning Activities	
	Lecturer	Students
Phase 5 *Integration*	1. Provide opportunities for students to collaborate with peers or in their group partners to find the holy verses of the Qur'an and Al-Hadith pertinent to the material that has been studied and write them down in their respective notebooks. 2. Conclude the lesson.	1. Collaborate with peers or in their group partners to find the holy verses of the Qur'an and Al-Hadith pertinent to the material that has been studied and write them down in their respective notebooks 2. Listen and conclude the lesson.

Source: Amin et al., 2022

The research data were gathered using a questionnaire and observation sheets to evaluate participants' character. Prior to their use, the instruments had been subjected to expert validation involving experts in R & D, research instruments and tools, and biology instruction. The validity test showed that the instruments were valid. Following expert validation, empirical test and reliability test of the instruments were conducted, resulting in a conclusion that the instruments were also valid and reliable. The alternative hypothesis tested in this study was "there is a difference in character between the experimental (RQANI) group and control group."

Data of the study were examined using descriptive and inferential statistics. Inferential statistics was run to test the effect of the learning model on the character of biology education students. The statistical analysis was assisted by the SPSS program. The analysis was performed using Analysis of Covariate (ANACOVA) with a significance level of 5%. Before the ANACOVA was done, normality and homogeneity tests were performed using One-Sample Kolmogrov-Smirnov and Levene's Test of Equality of Error Variances.

3. FINDINGS AND DISCUSSION

The mean scores of the experimental (RQANI) group and control group on the pretest and post-test are presented in Table 3.

Table 3. The Pretest dan Posttest Scores of Students Character

No	Learning Model	Mean Score	
		Pretest	***Posttest***
1	Control	39.1330	62.0782
2	RQANI	44.0813	76.5585

Table 3 shows that the mean score of the RQANI class improved by 32.4772 from the pretest to the post-test, while the mean score of the control class increased by 22.9452 from the pretest to the post-test. The increase in the students' mean scores can be seen in detail in Figure 1.

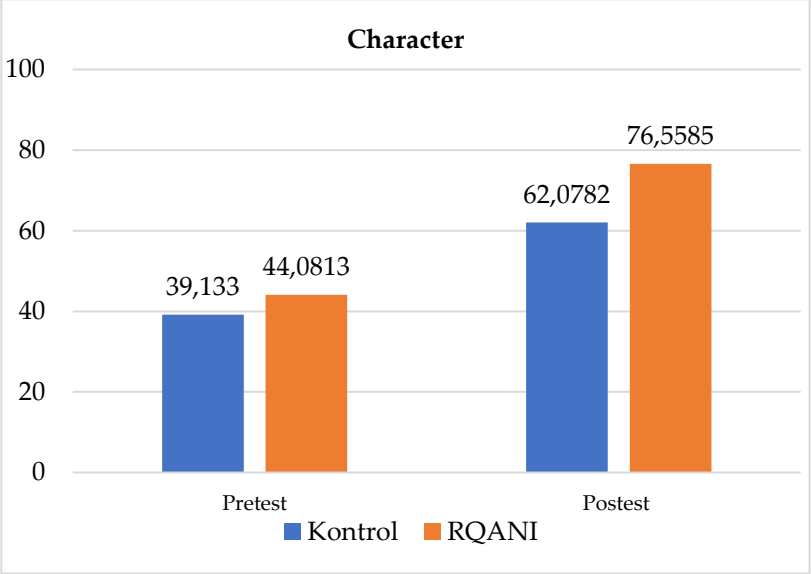

Figure.1 The Pretest and Post-test Mean Scores of Student Character

Meanwhile, the results of the normality test on the research data are summarized in Table 4.

Table 4. Test of Normality

	Learning Model	Kolmogorov-Smirnov(a)		
		Statistic	df	Sig.
Post-test	Control	.111	60	.062
	RQANI	.106	60	.090

a Lilliefors Significance Correction

The normality test showed a significance value of 0.062 for RQANI and 0.090 for the control group. Since both figures were greater than 0.05, it was concluded that the research data on student character were distributed normally.

Homogeneity test was also performed on the research data. The results of the homogeneity test are presented in Table 4. The homogeneity test result showed a significance value greater than 0.05, indicating that the variances of the data were homogeneous.

Table 4. Homogeneity Test

Descriptive Statistics

Dependent Variable: Pretest Karakter

Model Pembelajaran	Mean	Std. Deviation	N
Kontrol	39.1330	3.11473	60
RQANI	44.0813	7.03234	60
Total	41.6072	5.95836	120

Descriptive Statistics

Dependent Variable: Postest Karakter

Model Pembelajaran	Mean	Std. Deviation	N
Kontrol	62.0782	4.37683	60
RQANI	76.5585	4.82712	60
Total	69.3183	8.59715	120

Levene's Test of Equality of Error Variances[a]

Dependent Variable: Postest Karakter

F	df1	df2	Sig.
.026	1	118	.872

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Design: Intercept+XKARAKTER+Model

Hypothesis testing was done to examine the effect of the independent variable (learning model) on the independent variable (student character values). The hypothesis testing in this study was performed using ANCOVA. The result of the hypothesis testing is depicted in Table 5. Based on Table 5, F-calculated was 222.456 with a significance level of 0.000, which is smaller than 0.05. The result indicated that H_0 that said "there is no difference in character between the experimental (RQANI) group and the control group" was rejected. Thus, the alternative hypothesis was accepted. This finding suggests that the Reading, Questioning, and Answering Integrated with Islamic Values (RQANI) model can be implemented in the classroom to increase the character of biology students.

Table 5. Analysis of Covariance of RQANI Effect on Student Character

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	6475.499(a)	2	3237.749	163.290	.000
Intercept	7075.460	1	7075.460	356.837	.000
XCHARACTER	185.097	1	185.097	9.335	.003
Model	4410.918	1	4410.918	222.456	.000
Error	2319.906	117	19.828		
Total	585399.165	120			
Corrected Total	8795.404	119			

a R Squared = .736 (Adjusted R Squared = .732)

Parameter Estimates

Dependent Variable: Postest Karakter

Parameter	B	Std. Error	t	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Intercept	66.407	3.372	19.694	.000	59.729	73.085
XKARAKTER	.230	.075	3.055	.003	.081	.380
[Model=.00]	-13.341	.894	-14.915	.000	-15.112	-11.569
[Model=1.00]	0[a]	.	.	.	.	.

a. This parameter is set to zero because it is redundant.

The mean scores of the students' character are displayed in Table 5.

Table 6. Mean Scores of Student Character

Group	Xcharacter	Ycharacter	Difference	charactercor
Control	39.133	62.0782	22.9452	62.648
RQANI	44.0813	76.5585	32.4772	75.989

The mean score achieved by the control group (62.648) was smaller than the RQANI group (75.989). In the control class, the students' character score improved by 58.63% from the pretest to the post-test, whereas in the RQANI or experimental class, the students' character score increased by 73.67% from the pretest to the post-test.

The SPSS-based data analysis revealed that the RQANI learning model was effective in enhancing the character of biology students. Students must comprehend their own personality and environment to solve the daily problems they encounter. Character reflects the learner's personality that is formed through internalization and serves as the basis for thinking and acting. Character gives rise to an individual's characteristics. The development of a person's character can be enhanced by appropriate reinforcement at various educational levels.

The *Elaboration* stage of RQANI provides opportunities for students to work in groups to comprehend difficult learning materials, engage in dialogues and discussions with teammates about such materials, and solve everyday problems. Indirectly, this stage teaches students cooperation and empathy in the classroom.

The *Integration* stage of RQANI provides opportunities for students to discuss with their peers the connections between learning materials and pertinent verses of the Quran and Hadith. This phase teaches students that every academic concept can be contextually applied to real-world situations. This stage provides students with meaningful learning experiences by integrating learning materials with the sacred verses of the Quran and Al-Hadith.

Effective biology education will foster the cultivation of qualities such as self-control, attentiveness, integrity, perseverance, analytical reasoning, accountability, and collaboration (Dwikoranto, 2010). Good character is comprised of understanding, empathy, and behaviour guided by ethical principles, encompassing the cognitive, emotional, and behavioural dimensions of moral existence. The study of biology has a significant impact on the character development of students. An individual who engages in extensive study and research in the field of biology will be educated to possess the essential qualities of a researcher, such as meticulousness, honesty, integrity, foresight, impartiality, collaboration, and a commitment to continuous learning (Setyaningrum and Husamah, 2011). The cultivation of character is crucial for the future achievement of students. The primary objective of the regular learning process is to elicit the latent abilities of students in performing, perceiving, reasoning, and expressing ideas by inducing modifications in their conduct and personality (Astari, 2018).

The effectiveness of educators' instructional approaches can be determined by observing changes in students' emotive, cognitive, and psychomotor states (Hadi & Manurung, 2019). In order to foster mutual respect, embrace diverse perspectives, and encourage active participation in decision-making, educators should establish a democratic classroom climate and setting (Pala, 2011). Curiosity is the driving force behind the intrinsic urge to acquire insight, knowledge, and experience through the process of inquiry (Hunaepi et al., 2021). This character is anticipated to instill in students the capacity for critical thinking, the drive to produce scientific articles, and the proactivity to tackle everyday challenges. Cultivating a scientific mentality is essential for fostering a resilient student character.

The main components of character development through the RQANI model are carried out through the reading, questioning, answering, elaboration, and integration processes. Through reading activities, the values of discipline, hard work, independence, curiosity, friendship/communicativeness, love of reading, and responsibility can be instilled. Through questioning activities, honesty, discipline, independence, curiosity can be instilled. Through answering activities, honesty, tolerance, discipline, hard work, curiosity, environmental care, social care and responsibility can be instilled. Through elaboration activities, religious values, tolerance, democracy, curiosity, national spirit, love for the homeland, respect for achievements, friendship/communicative, love for peace, care for the environment, and social care can be instilled. Through integration activities, religious values, honesty, tolerance, independence, democracy, love of reading, environmental care, social care and responsibility can be instilled. The integration of character values is carried out in various ways, including the habit of saying greetings and praying at the beginning and end of learning, as well as reading the Al-Quran and Yasin every Friday, habituation of being honest and disciplined, modeling for tolerance and caring for the environment (Taib & Masri, 2020). Character is formed by being influenced by at least five factors, namely: basic temperament, belief, insight, motivation to live and travel. Characters that can bring success are empathy, endurance and faith (Setyaningrum & Husamah, 2011). Through education based on the noble values of Pancasila, the younger generation will be able to become good citizens who are able to understand their rights and obligations, understand the ideology of the state as a whole and correctly (Octavia & Rube'i, 2017).

In Indonesia, universities can instill 18 (eighteen) character traits in students based on religion, Pancasila, culture, and national education goals. The character values are (1) religious, (2) honest, (3) tolerant, (4) disciplined, (5) hard-working, (6) creative, (7) independent, (8) democratic, (9) curious, (10) nationalist, (11) love for the homeland, (12) appreciate achievements, (13) friendly/communicative, (14) peace loving, (15) loving to read, (16) caring for the environment, (17) caring for the community, and (18) responsible (Puskur, 2010). Each educational institution can determine the priority of certain character development based on the level of community development. The formation of student character in higher education must encompass the full potential of the individual, including knowledge, attitudes, and skills, so that the successfully formed characters are more durable. Integrating the values of faith and piety into the subject matter of education is one of the methods for achieving character education. Reading, questioning, answering, elaboration, and integration phases of the RQANI learning model have been shown to be optimal for fostering the character development of biology students.

Integrating Islamic principles into lecture activities including message delivery, attitude modelling, and proposal submission to build a noble character is crucial in the Islamic higher education system (Dimyati, 2018). Understanding, empathy, and behaviour in accordance with moral principles are the three pillars upon which character education rests. All three are required for pupils to understand, value, and act in accordance with policy values (Lickona, 1999). It is hoped that future teacher cadres would have more noble and holy personalities thanks to character education (Nugroho, 2017).

4. CONCLUSION

Data analysis in this study indicated that the RQANI learning model was effective in increasing the character of biology students. The mean score achieved by the control group (62.648) was smaller than that obtained by the RQANI group (75.989). Furthermore, the control group experienced a 58.63%

increase in their score from the pretest to the post-test, while the RQANI group experienced a higher increase, which is 73.67%, in their character score from the pretest to the post-test. This research focuses on integrating character values in biology learning. Further research is needed using the RQANI model in other subjects with a larger number of research samples. It is also necessary to conduct research in schools to see how far the influence of the RQANI model on improving student character. Thus, lecturers and teachers are anticipated to utilize the RQANI model to improve the character of students and the quality of classroom learning. To determine to what extent the potential phases of RQANI learning can enhance 21st century skills and life skills, additional research can be conducted.

REFERENCES

Amin, A. M., Ahmad, S. H., Zulkarnaim., & Adiansyah, R. (2022). RQANI: A Learning Model that Integrates Science Concepts and Islamic Values in Biology Learning. *International Journal of Instruction,* 15(3), 695-718.

Astari, J.I.R. (2018). Pengoptimalan Pendidikan Karakter dalam Pembelajaran Kimia yang Efektif dan Efesien dengan Media Interaktif. *Jurnal Pembelajaran Kimia*, 3 (1), 24-30. http://dx.doi.org/10.17977/um026v3i12018p024.

Astuti, A. D., Suyatno, S., & Yoyo, Y. (2020). The Strategy of Principal in Instilling Religious Character in Muhammadiyah Elementary School. *The European Educational Researcher,* 3(2), 67–85. https://doi.org/10.31757/euer.323.

Bahri, A., Palennari, M., Hardianto, Muharni, A., & Arifuddin, M. (2021). Problem-Based Learning to Develop Students' Character in Biology Classroom. *Asia-Pasific Forum on Science Learning and Teaching,* 20(2). https://eric.ed.gov/?id=EJ1307976.

Berkowitz, M. W., & Bier, M.C. (2005). What Works in Character Education: A Research-Driven Guide for Educators Character Education Partership. Character Education Partnership. Washington, D.C: Character Education Partnership.

Choli, I. (2020). Problematika Pendidikan Karakter Pendidikan Tinggi. *Thadzib Akhlaq*, 5(1), 57-72.

Dimyati, T.R. (2018). Pembentukan Karakter Mahasiswa dalam Sistem Pendidikan Tinggi Islam. *Tadris: Jurnal Pendidikan Islam*, 13(1), 17-32. https://doi.org/10.19105/tjpi.v13i1.1716.

Dwikoranto. (2010). Membangun Karakter Melalui Pembelajaran Berbasis Nilai di Fullday School. Proseding Seminar Nasional Pendidikan IPA Tahun 2010 dengan tema Membangun Profesionalisme Guru IPA melalui Penyelenggaraan Pendidikan Profesi Guru (PPG). FMIPA Universitas Negeri Yogyakart

Dwiyanti, Y., & Sumarmin, R. (2020). Need Analysis of Creation of Biology Module with Characters Nuance Supplemented Concept Maps for Students at Class X. *Proceeding of the International Conference on Biology, Sciences, and Education (ICoBioSE). Advances in Biological Sciences Research, volume 10.* https://doi.org/10.2991/absr.k.200807.060.

Hadi, K., Dazrullisa, Manurung, B., & Hasruddin. (2018). Biology Teaching Materials Based on Character Value. *IOP Conference Series: Journal of Physics: Conference Series*, 1114, 012035, 1-6.

Hadi, K., Dazrullisa., Susantini, E., Kuntjoro, S. (2022). The Influence of Environment-Based Biology Learning Integrated with Local Wisdom and Character Education on Student's Higher Order Thinking Skills and Environmental Care Attitude. *International Journal of Early Childhood Special Education (INT-JECSE),* 14(1), 663-672. DOI: 10.9756/INT-JECSE/V14I1.221079.

Hadi, K., & Manurung, B. (2019). The Effect of Teaching Materials Based on Local Value Integrated by Character Education through PBL Models on Students' High Order Thinking Skill. *Britain International of Humanities and Social Sciences (BIoHS) Journal*, 1(2), 213-223. http://doi.org/10.33258/biohs.v1i2.54.

Hadi, K., Dazrullisa, Manurung, B., Hasruddin. (2018). Biology Teaching Materials Based on Character Value. IOP Conferemce Series: Journal of Physics: Conference Series, 1114, 012035, 1-6.

Handoyo, L.D., & Listyarini, I. Y. (2020). Development of Character Assesment Instruments in Service-Learning at Biology Education Departement Sanata Dharma University. *International Journal of Indonesian Education and Teaching*, 2(1), 71-79. https://doi.org/10.24071/ijiet.2018.020108.

Hunaepi, Ikhsan, M., Suwono, H., & Sulisetijono. (2021). Curiosity in Learning Biology: Literature Review. *Prima Sains: Jurnal Pengkajian Ilmu dan Pembelajaran Matematika dan IPA IKIP Mataram*, 9(2), 343-353. doi:https://doi.org/10.33394/j-ps.v9i2.4272.

Irwandi., Santoso, S., Sakroni., Lukitasari, M., & Hasan, R. (2022). School-Community Collaboration in Inquiry-Based Learning to Strengthen Religious Character and Improve Learning Outcome of Students. *International Journal of Instruction*, 15(3), 913-930. https://doi.org/10.29333/iji.2022.15349a

Irwansyah, M., Ferawati, F., Suryani, E., Olahairullah, O., Ariyansyah, A., Nurfaturrahmanh, N., & Rubianti, I. (2020). Developing Biology Learning Tools Based on Character Education Integrated with Sustainable Local Wisdom to Enchance 21st-Century Attitude of Students. *Journal of Physiscs: Conference Series,* 1521, 042017. doi:10.1088/1742-6596/1521/4/042017.

Jamaluddin, J., Jufri, A.W., & Lestari, T.A. (2022). Strengthening Student Character Education through Biology Learning in High School. *Jurnal Penelitian Pendidikan IPA*, 8(2), 975–984. https://doi.org/10.29303/jppipa.v8i2.1575.

Jatmoko, D., Susanto, A., Purwoko, R.Y., Arfifin, Z., & Purnawan. (2021). The Implementation of ARCS Learning Model to Improve Students Learning Activities and Outcomes in Vocational High School. *Tarbawai: Jurnal Ilmu Pendidikan,* 17(2), 137-144. https://doi.org/10.32939/tarbawi.v17i2.1008.

Lickona, T. (1991). Educationg for Character: How Our School can Teach Respect and Responsibility. New York: Bantam Books.

Nihayati. (2017). Integrasi Nilai-Nilai Islam dengan Materi Himpunan (Kajian terhadap Ayat-Ayat Al-Qur'an). *Jurnal Edumath*, 3 (1), 65-77. https://ejournal.umpri.ac.id/index.php/edumath/article/view/285.

Nugroho, P. (2017). Internalisasi Nilai-Nilai Karakter dan Kepribadian Mahasiswa Pendidikan Agama Islam melalui Pendekatan Humanis Religius. *Edukasia: Jurnal Penelitian Pendidikan Islam*, 12 (2), 355-382. https://journal.iainkudus.ac.id/index.php/Edukasia/article/view/2491/0.

Nuratin, J. A., & Aminatun, T. (2019). Reinforcing National Character Education in Biology Based on the Education for Sustainable Development Concept. *Journal of Physiscs: Conference Series*, 1241 012025. doi:10.1088/1742-6596/1241/1/012025.

Octavia, E., & Rube'i, M.A. (2017). Penguatan Pendidikan Karakter Berbasis Pancasila untuk Membentuk Mahasiswa Prodi PPKN Menjadi Warga Negera yang Baik dan Cerdas. *Sosial Horizon: Jurnal Pendidikan Sosial,* 4(1), 111-124.

Pala, A. (2011). The Need for Character Education. *International Journal of Social Sciences and Humanity Studies*, 3(2), 23-32. https://www.sobiad.org/eJOURNALS/journal_IJSS/arhieves/2011_2/aynur_pala.pdf.

Pratama, Kristiyanto, A., & Widyastono, H. (2021). Character Values of Third Grade Slow Learner in Character Education at the Inclusive Elementary School. *Jurnal Pendidikan Indonesia*, 10(2), 345–352. https://doi.org/10.23887/jpi-undiksha.v10i2.28838.

Purnama, D., Hasruddin, & Aryeni. (2019). Student Character Education Building on Biology Learning Through the Scientific Approach. *Journal of Biology Education,* 8(1), 89-98. https://doi.org/10.15294/jbe.v8i1.29592.

Puskur, Pusat Kurikulum. (2010). Pengembangan dan Pendidikan Budaya dan Karakter Bangsa: Pedoman Sekolah. Jakarta: Puskur Kemendikbud.

Ridlo, S., & Irsadi, A. (2012). Pengembangan Nilai Karakter Konservasi Berbasis Pembelajaran. *Jurnal Penelitian Pendidikan,* 29(2), 145-154.

Sari, Y.K, Susilowati, S.M.E., & Ridlo, S. (2013). Efektivitas Penerapan Metode Quantum Teaching pada Pendekatan Jelajah Alam Sekitar (JAS) Berorientasi Karakter Dan Konservasi, *Unnes Journal of Biology Education*, 2 (2), 165-166. Retrieved from https://journal.unnes.ac.id/sju/index.php/ujbe/article/view/2850.

Setyaningrum, Y., & Husamah. (2011). Optimalisasi Penerapan Pendidikan Karakter di Sekolah Menengah Berbasis Keterampilan Proses: Sebuah Persektif Guru IPA-Biologi. *Jurnal Penelitian dan Pemikiran Pendidikan, 1* (1), 69-81.

Susilowati, S. M. E. (2017). Membangun Karakter Siswa melalui Pembelajaran Biologi Berpendekatan JAS. Conference: Bioteknologi dan Pembelajaran Biologi Menuju Generasi Emas, halaman 1-8. ttps://www.researchgate.net/publication/321110395_MEMBANGUN_KARAKTER_SISWA_MELALUI_PEMBELAJARAN_BIOLOGI_BERPENDEKATAN_JAS.

Taib, E. N., & Masri. (2020). Pengintegrasian Nilai Karakter dalam Pembelajaran Biologi pada Sekolah Menengah Atas di Takengon dan Lhokseumawe. *Jurnal Ilmiah DIDAKTIKA,* 20(20), 225-237.

Wulandari, N., Nugroho, Sunyoto E., & Lisdiana, L. (2020). The Analysis of Character Formation of Curiosity in Science Learning in Elementary Schools. *Journal of Primary Education*, 9(4), 408–412. https://doi.org/10.15294/jpe.v9i4.41245.

Yanzi, H. (2019). Analysis for Strengthening Community-Based Character Education. International *Journal of Arts, Humanities and Management Studies*, 05 (01), 12. https://doi.org/10.33578/jtlee.v4i2.7896.

Zurqoni, Retnawati, H., Arlinwibowo, J., & Apino, E. (2018). Strategy and Implementation of Character Education in Senior High Schools and Vocational High Schools. *Journal of Social Studies Education Research*, 9(3), 370–397. https://doi.org/10.17499/jsser.01008.