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Effectiveness of Science Learning Model Containing Balinese Local Wisdom in Improving Character and Science Literacy of Junior High School Students

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Abstract

The current situation is the low character of students, so brawls and violence often occur in various layers of society. The present study is aimed at analyzing the effectiveness of the science learning model in improving the character and scientific literacy of junior high school students. The research is a quasi-experimental design in the form of a posttest-only control design. The study sample was 158 people. A questionnaire and test were used for the character and scientific literacy variable data collection. Descriptive analysis and inferential analysis were used to analyze the post-test data. The descriptive analysis involved the mean, standard deviation, and variance. Inferential statistical analysis was done with the MANOVA test. The analysis results showed that the F value for Pillae Trace, Wilk Lambda, Hotelling Trace, and Roy's Largest Root had significantly less than 0.001, which means all are significant. Therefore, the study indicates that the science learning model containing Balinese local wisdom is effective on character and scientific literacy. Thus, this learning is recommended as a solution that can be used as an innovative learning model.

Keywords: Character, Science learning model containing balinese local wisdom, Science literacy.

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1. Introduction

The era of Disruption has entered half new in the development of knowledge and technology which has penetrated the education sector. Stakeholders who are interested in environmental education are expected to be capable of responding positively to the changes that are happening in the era of industrial revolution 4.0 [1-3]. Education must be reorganized to reach the goal of producing thinkers who are capable of building a knowledge-based social and economic order in the 21st century [4, 5]. This condition certainly requires students to have revolution 4.0 skills. The skills of 4.0 include scientific

and metacognitive skills, the ability to think critically and creatively, and the ability to communicate and collaborate effectively [6-8]. The skills must be possessed by the students. The possession of these skills will enable students to solve problems they encounter in their daily life[9-11]. In addition to these skills, it is also necessary to develop new literacy which includes data literacy, technological literacy, and human literacy [12, 13]. Part of data literacy is scientific literacy which is the main goal of science education about scientific concepts and principles, scientific laws and theories, and inquiry skills.

Science literacy will become an experience and key to success in education science [14, 15]. Science literacy is a method for engaging and motivating learners through the effective teaching of science by scientists. Science literacy is the ability to understand and use written language to build meaning from various science texts [16, 17]. PISA confirms that science literacy is very important in using scientific knowledge to answer questions and draw conclusions based on existing evidence, so one could understand and make a decision related to nature and changes to nature through the activities of man [18, 19]. Science literacy has attracted the attention of scientists, lecturers, and policymakers because it is very necessary in the modern society for tackling various problems in knowledge and technology [18, 20-22]. Science literacy is the ability to read, write, and communicate about science topics and socio-scientific issues, helping individuals to solve their day-to-day problems and promoting the creation of new knowledge in the field of science and technology [16, 17, 23]. The description gives a clear picture of science literacy for participants' education.

Optimal ability science literacy will enable students to achieve impactful learning results. Learning results are all forms of outputs produced by the learning process, good knowledge, skills as well as attitude. The product of learning influences the students' emotions greatly, specifically in the learning phase [24, 25]. Good learning outcomes are also influenced by the attitudes of a good student. The attitude of participants towards education could reflect from the character of students [26-28]. One mandatory attitude students must have is a social attitude. Social attitude is a trend for acting positively or negatively in special social situations [29, 30]. Characters of students will develop through experience and a continuous learning process. Good student characters are characterized by values and ethics like caring for others, honesty, fairness, responsibility, and respect for self and others [31-33]. The formed character could start with the interaction between fellows, exchanging information about circumstances, socializing, and interacting, in family, community, school as well as environment [30, 34]. Character is very important for participants' education because the aim of education is to make participants know, care and internalize values so that they can behave as noble people. Good character increases the quality of education at school, and through the formation of good character, participants receive whole, comprehensive, and balanced education, according to standard [35-37].

However, at the moment, there are still many violent crimes occurring in different layers of society. There are various conflicts on the ground of ethnicity, religion, race, etc. in Indonesia. In the areas of character and science literacy in Indonesian, people are still weak and are unable to manage conflicts of ethnicity, religion, race, and inter-group so endless suspicion and hostility could easily occur [38, 39]. The minimum good character in an individual will help prevent social conflicts from happening [40, 41]. Weak character promotes mutual suspicion and conflicts in society [42, 43]. Through learning, participants should gain an understanding of the process of internalization and experience the practice of socializing, to increase awareness of national unity and individual values, social values, achievement of mental processes (knowledge and understanding) and acquire skills and abilities to socialize [44, 45]. Strengthening character results in the development of character to shape good citizens based on social values. This is what makes it important to emphasize character and science literacy.

One solution offered is a science learning model loaded with Balinese local wisdom. This learning model is loaded with Balinese local wisdom so that participants will be able to apply their learning based on their local context. Science learning packaged with local Balinese culture can develop basic science competencies [20, 46]. The existence of local wisdom-based learning can improve attitude and character [47, 48]. The application of a learning model containing Balinese local wisdom can fill the gap between scientific literacy and student character in the learning process [29] The application of local wisdom-based learning can also construct student behavior and character [48, 49]. Studying with a learning model that develops social-constructivist principles gives a big opportunity to live an easy life with the experience gained [50]. The science learning model will have collaborated with the Balinese local wisdom.

Local wisdom is a very decisive honor of entity and dignity of man in his community. Substantially, local wisdom is the value that applies in a society [51, 52]. Local wisdom is a local perception and ideas that contain wise, creative, kind values, which are internalized from generation to generation [53, 54]. The values of Balinese local wisdom contain the truth and thus are followed by the community member, and named the noble values (*adhiluhung*) which serve as the philosophy of good behavior basis towards harmonization [55, 56]. The Balinese local wisdom-based science learning model is defined as a series of learning activities contextualized based on real-life problems mixed with the problem-solving process that emphasizes the values themselves. By studying and analyzing in-depth aspects of Indonesian local cultural wisdom, especially in Bali, students can find many local wisdom concepts that have been practiced in people's daily lives. This learning model is an attempt at the role of education in developing 21st-century skills to master various skills [57, 58]. Based on the description, the science learning model loaded with Balinese local wisdom can impact science literacy and character.

Several supporting research statements, including research that states that science learning packed with Balinese local culture can develop competence-based science [59]. The existence of learning based on local wisdom is capable of improving skills, attitude, and character [47, 48, 60] Application of a learning model loaded with Balinese local wisdom can fill the gap between science literacy and the character of students in the learning process [29] Application of learning based on Balinese local wisdom can also improve behavior and character of students. Learning model based on problem-solving Balinese local wisdom is effective for increasing the ability to solve problems [61]. Based on descriptions, purposeful research is done to analyze the effectiveness of the science learning model -loaded with Balinese local wisdom in increasing the character and science literacy of students.

2. Materials and Methods

The present research is aimed at analyzing the effectiveness of learning based on Balinese local wisdom in improving character and scientific literacy in science learning. The study is a quasi-experimental design in the form of a posttest-only control design [62]. The implementation of this research was carried out by giving science learning treatment containing Balinese local wisdom for the experimental class and treating learning without a science learning model containing Balinese local wisdom. The second group or control group was given a post-test to know the difference between character and science literacy. The sample study uses a purposive sampling technique based on the location of schools in the area, city, suburb, town, and village with the characteristics of students with various diversity. The experimental group had 88 students and the control group had 70.

Questionnaires and tests were used as the data collection method for both character and critical thinking variable ability. Characters of participants evaluated are values that shaped moral feelings and moral actions (moral behavior) in the form of attitudes, words, and actions participants manifest based on religious norms, laws, etiquette, culture, and customs as universal values of behavior participants exhibit [63]. Questionnaire character developed from character data obtained through a questionnaire following indicators that are (1) religious, (2) homes, (3) discipline, (4) democratic, (5) desire to know, (6) care, and (7) take responsibility [64]. The existing indicators will be developed into a 25-plain statement. A more complete character instrument grid is shown in Table 1.

Table 1.
Grid instrument character.

No	Dimension	Indicator	Statement		Amount
			Positive	Negative	
1	Religious	Happy pray	1	0	1
		Always give thanks to God for enjoyment	1	0	1
		Disclose admiration of God's greatness	1	0	1
2	Honest	Say something right although that is bitter	1	0	1
		Avoid cheating, plagiarism, or stealing	0	1	1
		Have the courage for showing something right	0	1	1
		Could be trusted to do something said	1	0	1
3	Discipline	Obedient to the time set by the organization/school	1	0	1
		Obeying the applicable rules without feelings of being forced	1	0	1
		Commitment and loyalty to assigned tasks/jobs.	0	1	1
4	Democratic	Think positive in every association with friends and colleagues	1	0	1
		Show respect and appreciate every different opinion	0	1	1
		Listening to every view although different from personal perception	1	0	1
		Avoid pitched treatment harassing and demeaning other participating students, including those who are physically and mentally disabled.	1	1	1
5	Sense of Want Know	Submit question	1	0	1
		Digging, tracing, and investigating	0	1	1
		Interested in various things for which answers are not yet found	1	0	1
6	Care	Helping people in need	1	0	1
		To do social activities for helping people in need	0	1	1
		Maintain a clean school environment	0	1	1
		Throw away trash in the trashbin	0	1	1
		Turning off the water faucet that pours water not being used	1	0	1
7	Responsibility	Doing each job just to make a living	1	0	1
		Doing Duty with good intention	1	0	1
		Accept the risk of every action taken	0	1	1

After the social attitude instrument was developed, then its validity and reliability were tested. Quantity score validity contents showed with Content Validity Ratio (CVR), CVR is in agreement with the recommendation of the experts (validators) of one item that can express level validity contents through indicator single range from -1 to 1. Conditions; If

CVR > 0, then item declared Valid. If CVR = 0, then the item is declared Invalid but Fixed. If CVR < 0, then item declared Invalid / Failed. Analysis result validation obtained an average score of 1 which means 25 questions were declared valid. The next reliability test is seen from quantity coefficient reliability Calculated Cronbach Alpha uses the SPSS Coefficient value correlation instrument obtained from Statistical Package for Social Sciences (SPSS) analysis. Standard instrument reliability follows Kerlinger's theory, that is, reliability of at least 0.70. the results of the validity and reliability test of social attitude instruments from 25 statement items obtained 2 2 valid statements and 3 failed items with a reliability value of 0.848 in the very high-reliability category.

Literacy data collection was done by testing science literacy, which includes 1) *Scientific contexts, which* refer to understanding concepts of science and applications in everyday life situations. *2) Scientific knowledge* refers to an understanding of science content and science process. 3) *Scientific competencies* refer to the scientific process involved when answering questions or solving problems, such as identifying and interpreting proof as well as explaining the conclusion. The 3 existing indicators developed into 12 questions essay. A more complete, developed grid is described in Table 2. After the ability instrument of science literacy was developed, it was then tested for validity and reliability.

Table 2.
Grid Instrument literacy science.

No	Dimension	Indicator	Question Item Number
1	Scientific contexts	Explain in local situations the application of the concept of pressure based on the discourse presented	1
		Determine and analyze the global situation of respiratory system disorders due to smoking based on the discourse presented	3
		Personally, analyze the dangers of alcohol to human excretory organs based on the discourse given	6
		gong musical instrument based on the given discourse	8
2	Scientific knowledge	Evaluate and identify the concept of pressure in a problem	2
		Construct, conclude, and identify the impact of smoking addictive substances	4
		Construct and write about the process of decomposition of light in the formation of rainbows.	10
		Comparing and critiquing rainbow formation based on the angle of incidence of the broadcast.	11
3	Scientific Competentcies	Identify, investigate data, and construct solutions for the dangers of smoking to respiratory health	5
		Identify, investigate data, and construct solutions for the dangers of alcoholic beverages to human excretory health	7
		Identifying problems and testing information from investigation results to solve sound wave problems	9
		Comparing and critiquing the process of rainbow formation through scientific data investigation, especially the possibility of finding the end of the rainbow	12

The post-test data were analyzed using descriptive analysis and inferential statistical analysis. The Descriptive Analysis looked for mean value, standard deviation, and variance. inferential statistical analysis was used to know the influence of the science learning model containing Balinese local wisdom on improving character and scientific literacy. inferential statistical analysis was used with the Multivariate Analysis of Variance (MANOVA) test. Before the MANOVA test was implemented, formerly conditional tests were conducted, such as the normality test, homogeneity test, and multi-correlation test. The normality test data was intended to find out the population distribution data. The normality test of the data was carried out by using the *Kolmogorov-Smirnov test* and *the Shapiro-Wilk test statistic.* The criteria test is: the data is normally distributed if the resulting significance number is greater than 0.05. The homogeneity test is intended to show two or more sample data groups that have the same variance. Thus the differences that appear in the hypothesis testing come from the differences between groups. For this homogeneity test, the researcher used Levene*'s test of equality of error variance.* The test criteria used were: the data have the same variance (homogeneous) if the resulting significance number is greater than 0.001 and in other cases, the sample variance is not homogeneous. MANOVA test was conducted with SPSS 26.0 for Windows help. The F test was conducted to test the hypothesis. It was conducted through multivariate analysis of variance (MANOVA). The multi-variate test would show each source of effect on the dependent variable, such as scientific literacy and student character. Multi-variate tests or tests between subjects were conducted on the F statistical value of significant figures of the *Pillai's Trace, Wilks' Lambda, Hotelling, Trace, and Roy's Largest Root*. A significance value less than 0.001 means that $_{H0}$ is rejected, which means that there is an effect of the dependent variable between groups according to the source. All hypothesis testing resulted in a significance level of 5% because this research is a field of educational study.

3. Results and Discussions

3.1. Result

This study aimed at analysing the science learning model based on Balinese local wisdom effectiveness in improving the junior high school character and scientific literacy in Buleleng Regency. The research carried out got the results as expected, that the descriptive analysis resulted in the differences between students who were taught a science learning

model containing Balinese local wisdom and students who were taught without a science learning model containing Balinese local wisdom. The descriptive data analysis results are shown in Table 3. The results show that differences appear in the mean value, there is a difference in the average character value of the experimental class and control class of 0.279 and the difference in the average value of scientific literacy between the experimental class and the control class is 0.235.

Table 3.
The character and scientific literacy descriptive analysis results.

Treat	Dependent variable	Mean	Std. Deviation	Max.	Min.	N
Learning model science loaded with Balinese local wisdom	Character	0.770	0.088	1.000	0.608	88
	Science Literacy	0.596	0.193	1.000	0.235	88
No science learning model loaded with Balinese local wisdom	Character	0.491	0.078	0.639	0.160	70
	Science Literacy	0.362	0.193	0.731	0.034	70

Analysis next conducted for post-test data is analysis MANOVA. Before conducting analysis MANOVA, result data analysis more formerly conditional tests were carried out that as normality test, homogeneity test, and multi-correlation test. The normality test was conducted using *Kolmogorov-Smirnov*. The analysis results show that all data come from groups of data that are normally distributed, and indicated by the value of Sig. > 0.05 which is 0.200. The results of a more complete analysis are shown in Table 4. After the normality requirements are met, the next prerequisite test is the homogeneity test. The homogeneity test in the study was conducted through two kinds of analysis, namely *Levene's Test of Equality* and *Box's Test of Equality of Covariance Matrices.* The results show the same meaning, namely, the research data comes from homogeneous data groups, this can be seen from the sig value. each test showed a value of more than 0.05. Value of Sig. *Levene's Test of Equality* is 0.119 for social attitudes, while the value of Sig. of critical thinking skills is 0.967. Meanwhile, in the *Box's Test of Equality of Covariance Matrices test*, the results of the variance matrix test on the data show the *Box's M number* of 4.606; the F value is 1.514, and the sig. of 0.209. The next prerequisite test is a multi-correlation test where this test aims to determine the relationship between each variable being analyzed. The results show that all tested data groups give a tolerance value> 0.1 and a VIF value <1,000 for each data group. In conclusion, the entire data group in this study did not have multicollinearity.

Table 4.
Normality analysis results.

	Treat	Kolmogorov-Smirnov		
		Statistics	df	Sig.
Character	Science Learning loaded with Balinese Local wisdom	0.0018	88	0.200
	Without Science Learning loaded Balinese Local wisdom	0.090	70	0.200
Science Literacy	Learning Science loaded wisdom Balinese Local	0.0018	88	0.200
	Without Learning Science loaded wisdom Balinese Local	0.086	70	0.200

Table 5.
Multivariate test results.

Effect		Value	F	Hypothesis df	Error df	Sig.
Intercept	Pillai's Trace	0.984	4667.059	2.000	155.000	0.000
	Wilks' Lambda	0.016	4667.059	2.000	155.000	0.000
	Hotelling's Trace	60.220	4667.059	2.000	155.000	0.000
	Roy's Largest Root	60.220	4667.059	2.000	155.000	0.000
A	Pillai's Trace	0.744	224.988	2.000	155.000	0.000
	Wilks' Lambda	0.256	224.988	2.000	155.000	0.000
	Hotelling's Trace	2.903	224.988	2.000	155.000	0.000
	Roy's Largest Root	2.903	224.988	2.000	155.000	0.000

The test requirements for the MANOVA analysis have been met, where the research data are normally distributed, and homogeneous and there is no multi-correlation between variables so that hypothesis testing with MANOVA can be carried out. The complete analysis results are described in Tables 5 and 6. The result analysis shows that the F price for Pillae Trace, Wilk Lambda, Hotelling Trace, and Roy's Largest Root have more significance - small from 0.0 01, which means all significant. Therefore, it is declared that there is an influence of the science learning model containing Balinese local wisdom on character and science literacy. Tests of Between-Subjects Effects that relationship of learning model (A) with social attitude (Y1) gives the F value as 435.32 with a significance of 0.000 < 0.001. Therefore, the science learning model containing Balinese local wisdom has a positive influence on character. Meanwhile, the relationship between learning model (A) and science literacy (Y2) gives an F value of 57.5 0 with a significance of 0.000 < 0.001. Also, there is an influence of the science learning model containing Balinese local wisdom on science literacy. The results show that the science learning model that is based on Balinese local wisdom simultaneously promotes character and science literacy of

students. The next calculation is to determine the effectiveness of the science learning model containing Balinese local wisdom on the character and scientific literacy of junior high school students in Buleleng Regency, using the t-test shown in Table 7.

Table 6.
Tests of between-subjects effects.

Source	Dependent Variables	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	Character value (Y1)	3.038	1	3.038	438.323	0.000
	Literacy value science (Y2)	2.135	1	2.135	58.505	0.000
Intercept	Character value (Y1)	61.972	1	61.982	8879.251	0.000
	Literacy value science (Y2)	35.806	1	35.806	964.564	0.000
A	Character value (Y1)	3.038	1	3.038	435.323	0.000
	Literacy value science (Y2)	2.135	1	2.135	56.505	0.000
Error	Character value (Y1)	1.089	156	0.007		
	Literacy value science (Y2)	5.791	156	0.037		
Total	Character value (Y1)	70.122	158			
	Literacy value science (Y2)	46.249	158			
Corrected Total	Character value (Y1)	4.127	157			
	Literacy value science (Y2)	7.926	157			

Table 7.
t test results.

Variables	N	Average	SD	t	Sig.	ICE	Category
A1Y1	88	0.770	0.087	20.86	0.000	3.57	High Effectiveness
A2Y1	70	0.492	0.078				
A1Y2	88	0.595	0.194	7.58	0.000	1.28	High Effectiveness
A2Y2	70	0.362	0.194				
A1Y1Y2	88	0.685	0.1405	15.00	0.000	1.89	High Effectiveness
A2Y1Y2	70	0.427	0.136				

Table 7 shows that: (1) the value of t character is calculated from the root of F Manova F AY1 which is 20.86; the 2-way (2-tailed) significance value of 0.000 < 0.001 means that there is a significant difference in character between the experimental (A1) and control (A2) groups, where the mean Y1A1 is 0.770 > Y1A2 0.491 means that the science learning model containing Balinese local wisdom is more effective in improving the character compared to conventional learning models. This is reinforced by the ES value of 3.57 which is included in the high effectiveness category; (2) the t-value of critical thinking skills is calculated from the roots of FManova FAY2 which is 7.58; 2-way (2- *tailed*) significance value of 0.000 <0.001 means that there is a significant difference in scientific literacy (Y2) between the experimental (A1) and control (A2) groups, where the average Y2A1 is 0.596 > Y2A2 0.362, meaning that the science learning model contains Balinese local wisdom is more effective in improving scientific literacy compared to conventional learning models. This is reinforced by the ES value of 1.21 which is included in the high effectiveness category; (3) the simultaneous t-value is calculated from the root of F *Wilks Lambda* A, which is 15.00; 2-way significance (2- *tailed*) 0.000 < 0.001 means that there is a significant difference in character (Y1) and scientific literacy (Y2) between the experimental group (A1) and control (A2), where the mean Y1Y2A1 0.683 > Y1Y2A2 0.427 indicating that science learning model containing Balinese local wisdom is more effective in simultaneously improving the character and scientific literacy compared to conventional learning models. This is reinforced by the ES value of 1.89 which is included in the high effectiveness category.

4. Discussion

The results of the study reveal several findings. First, the science learning model containing Balinese local wisdom was effective in improving character. Its effectiveness cannot be separated from the activities and steps carried out in the learning process [65-67]. Science learning containing Balinese local wisdom familiarizes students with interacting with the surrounding environment because the learning process carried out is phenomenon-based. The problems that are taught are lessons found in everyday life. Phenomenon-based learning is built fundamentally on collaborative learning experiences and helps develop lifelong learning skills [50, 68] Phenomenon-based science learning motivates students to learn through the contextualization of real problems [20, 69]. This learning model also uses constructivist principles to encourage the application of prior knowledge, collaborative learning, and active engagement [70-72]. The science learning model containing Balinese local wisdom supports character strengthening because most of the syntax in this model is learned in groups. The formation of heterogeneous groups began right from the stage of the learning organization, then to the stage of developing and presenting the work of students collaborating in the learning process [73, 74]. Character strengthening is the result of character development forming good citizens based on social values [43, 75].

In addition, the content of Balinese local wisdom can form an attitude of tolerance, curiosity, responsibility, and care [11, 76, 77] Directly or indirectly, the character of students will be honed with an approach based on Balinese local wisdom because they are accustomed to collaborating with different backgrounds. Local wisdom can build and strengthen character [48, 78]. So, the character of students is formed as a result of the implementation of a structured learning model that

optimizes interaction in heterogeneous groups based on the content of Balinese local wisdom in the science learning model. The results of the study which stated the effect of science learning on students' character compared to traditional teaching, found that science learning combined with local culture was effective in helping students acquire positive attitudes [79, 80]. Research states that learning based on phenomenon could integrate method planting classic, activity-based extracurricular in the form of activity religion, scouting, sports, and the Islamic arts, as well as habituation morals. This model has proven to increase morale [20, 81]. Research states that the implementation of PBL is an effective method in increasing the knowledge of students about the environment and developing a positive attitude toward the environment, Material most important from activity learning based on the problem is scenario prepared problem about eye lesson [10, 82, 83]. Research states the difference between the problem-based Trikaya Parisudha learning model on social attitudes and social studies learning outcomes [84]. Research states that the learning model Problem-Based Learning (PBL) based on local wisdom is stated positive effect on the social attitudes of students [85]. Thus, it can be said that the science learning model -loaded with Balinese local wisdom could effectively increase the character of students.

The second finding, the science learning model loaded with the Balinese local wisdom is effective in improving the science literacy of students. Science literacy has formed the existence habituation of students to study compatible problems with the application of a science learning model loaded with Balinese local wisdom. It is a pattern of communication and habituation of self-introspection for solving problems, analyzing the problem until you are capable of giving alternative solutions in state diverse groups are a very decisive step in science literacy. So the learning process of the rated student is more fun and challenging because could disclose his opinion with a good in-class variety [20, 86]. In learning based on wisdom, local science literacy is formed through heterogeneous groups so that the participants are trained to differentiate and decide which information is appropriate and which is not worthy of belief, which idea is supported by empirical evidence, and which idea is based only on assumptions [62, 87, 88]. So they are essentially built on collaborative learning experiences and help develop lifelong learning skills [50, 89]. Learning is based on phenomena using constructivist principles to encourage the application of prior knowledge, collaborative learning, and active engagement [70]. Science literacy needs to be possessed by students as a key strategy for learning science in the early years and should be applied in real life according to the situations faced by students in everyday life [90-92]. Based on this description, it can be said that the existence of learning containing Balinese local wisdom will provide opportunities for students to develop scientific literacy skills.

The third finding, based on the data results, the science learning model containing Balinese local wisdom simultaneously improves the character and scientific literacy of students. Meanwhile, multicultural learning that prioritizes local wisdom will foster children's awareness of the importance of respecting other people and different cultures [93]. When a science learning model containing local wisdom is applied, the achievement of scientific literacy will appear when completing assignments, both individually and in groups, with teacher assistance to provide new insights to students [94, 95]. The temporary character of the student is formed to interact with other people in the group in a way that shows respect to ideas and their behavior, by general application this help student learn skills and characteristics, such as collaboration and working for a team, thinking critically and solving problems, creativity and innovation, self-direction, and interpersonal relationship [96, 97]. Learning science-loaded wisdom Balinese locals can increase their character and science literacy.

The fourth finding, learning science loaded with Balinese local wisdom is more effective compared to learning without a science learning - model loaded with Balinese local wisdom Science learning -model loaded with Balinese local wisdom gives the opportunity participants to study more actively and solve their real-life problems more effectively [11, 98]. Active involvement of students in the learning process will make learning more meaningful which makes the student get experience that can be used in daily life [99, 100]. Learning science loaded with Balinese local wisdom helps the student to acquire science literacy with no answer accepted from other people. Science literacy is a method for engaging and motivating learners through effective learning of science and work scientifically [15, 17]. Scientific literacy is the ability to understand and use written forms of language needed by society in constructing meaning from various scientific texts [23, 101]. So the existence of this learning model will make students develop scientific literacy skills. In this learning process, there will also be a process of interaction between students both competing and working together which of course shapes the character of students. Students' attitudes can be shown by behavior that can be seen by others and can be assessed for character [26, 27]. Learning science loaded with Balinese local wisdom is an activity-based learning that begins with the existence of real-life problems in the situation around the environment of the student with the splitting process of problem values character. Science learning model loaded with Balinese local wisdom is activity-based education in developing 21st-century skills for dominating the world [57]. Based on the description, a science learning model loaded with Balinese local wisdom could impact science literacy and the character of students. Therefore, this science literacy model is recommended to produce highly innovative graduates who are worthy in learning and character.

5. Conclusion

The science learning model loaded with Balinese local wisdom is effective in promoting students' character and science literacy. Students use it to solve real-life problems.

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