The Implementation of Culturally Responsive Teaching to Improve Students' Learning Outcomes and Activity

Binti Nuriyati Rahayu[1]*, Muchlis[2], Ariwati Wahyu Mumpuni[3]
[1]Department of Teacher Professional Program, Universitas Negeri Surabaya, Indonesia
[2]Department of Chemistry Education, Universitas Negeri Surabaya, Indonesia
[3]Senior High School State 1 Kediri, Indonesia
*E-mail Corresponding Author: bintinr31@gmail.com

Abstract

This study aims to determine the increase in students' learning outcomes and activity through the implementation of Culturally Responsive Teaching (CRT) to solubility and solubility product material in Class XI-MIPA G SMAN 1 Kediri. This research was conducted using the classroom action research model developed by Kemmis and Taggart which consisted of plan, action, observe, and reflect in two cycles. The data obtained was in the form of quantitative data, namely learning outcomes and qualitative data, namely observation sheets. Quantitative data analysis was carried out using descriptive statistical techniques with percentage formulas and descriptions for qualitative data. In the pre-action, students' learning outcomes and activity were obtained with a mean of 57.2 and 63.8. In Cycle I, students' learning outcomes increased by an average of 80.0 and students' activity increased by an average of 71.4, while students' learning outcomes increased by 89.1 and students' activity increased by 91.4 in Cycle II. The results showed that the implementation of CRT can improve students' learning outcomes and activity in Class XI-MIPA G SMAN 1 Kediri.

Keywords: activity; culturally responsive teaching; learning outcome

Abstrak

Penelitian ini bertujuan untuk mengetahui peningkatan hasil belajar dan keaktifan peserta didik melalui penerapan *Culturally Responsive Teaching* (CRT) pada materi kelarutan dan hasil kali kelarutan di Kelas XI-MIPA G SMAN 1 Kediri. Penelitian ini dilakukan menggunakan model penelitian tindakan kelas yang dikembangkan Kemmis dan Taggart yang terdiri atas perencanaan, tindakan, pengamatan, serta refleksi sebanyak dua siklus. Data yang diperoleh berupa data kuantitatif yaitu hasil belajar dan data kualitatif yaitu lembar observasi. Analisis data kuantitatif dilakukan menggunakan teknik statistika deskriptif dengan rumus persentase dan deskripsi untuk data kualitatif. Pada pratindakan, diperoleh hasil belajar peserta didik dan keaktifan peserta didik dengan rata-rata 57,2 dan 63,8. Pada Siklus I, hasil belajar peserta didik meningkat dengan rata-rata 80,0 serta keaktifan meningkat dengan rata-rata 71,4, sedangkan hasil belajar meningkat sebesar 89,1 dan keaktifan peserta didik meningkat sebesar 91,4 pada Siklus II. Hasil penelitian menunjukkan bahwa penerapan CRT dapat meningkatkan hasil belajar dan keaktifan peserta didik di Kelas XI-MIPA G SMAN 1 Kediri.

Keywords*: culturally responsive teaching; hasil belajar; keaktifan*

Introduction

New Paradigm Learning directs learning to be student-centered, independent and reflective. Teachers act as facilitators to design learning according to the characteristics and needs of students that is holistic, contextual, useful, and meaningful. Learning raises real problems and conditions around students so that students better understand the context of learning (Badan Standar Nasional Pendidikan, 2010; Sufyadi *et al.*, 2021).

Based on the observation in Class XI-MIPA G at SMAN 1 Kediri, learning is still teacher-centred with the lecture method. As a result, students are not active in learning and feel bored in monotonous learning. Students' learning motivation is low which is shown by the behaviour of not paying much attention during learning and not wanting to record learning materials. The learning outcomes of students are also still low, namely 48.5% of students have not completed the learning with minimum competency criteria 75.

Solubility and solubility product is one of the chemistry materials that combines various concepts and mathematical calculations. Students find this material difficult (Rafiuddin, Dali and Anton, 2018; Sudiana, Suja and Mulyani, 2019). The implementation of conventional methods does not link students' knowledge and experience in their daily life. As a result, students find this material less useful and meaningful in their daily life (Ismawati, 2017).

The CRT approach focuses on the integration and exploration of culture, learning experiences, cultural identity and students' backgrounds to create a meaningful learning process. Students are expected to understand and love their own culture and appreciate the other culture. CRT brings the context of the students' surrounding environment closer to increase students' motivation and learning outcomes (Rahmawati et al., 2020).

CRT needs to be applied in response to Indonesia's cultural diversity, which is the strength of Indonesian education. The noble

98

values and cultural roots of each region are integrated as a source of learning to strengthen Indonesian human identity. Indonesia hasThe diverse and heterogeneous Indonesian people are united in Bhinneka Tunggal Ika, Pancasila values, and religiosity. This is in accordance with Ki Hadjar Dewantara's thoughts, namely: "Education and teaching in the Republic of Indonesia must be based on Indonesian culture and society towards inner happiness and physical safety" (Suparlan, 2016; Wiryopranoto *et al.*, 2017)

Chemistry learning that applies the CRT approach is known to make chemistry learning more meaningful. The integration of chemical concepts and culture can increase their cultural identity (Rahmawati & Ridwan, 2017). The teacher acts as a facilitator in learning to help students relate chemical concepts to the real life and culture of students so that it can increase students' learning outcomes and activity.

Based on these problems, this class action research was conducted to determine the improvement of students' learning outcomes and activity through the implementation of Culturally Responsive Teaching on solubility and solubility product material in Class XI-MIPA G SMAN 1 Kediri. Learning is carried out in five stages, namely 1) Self identification, 2) Culturally understanding, 3) Collaboration, 4) Critical reflective thinking, and 5) Transformative construction. Learning is said to be successful if classical learning completeness of at least 85% is achieved.

Method

This study used the classroom action research model according to Kemmis and Taggart (Arikunto et al, 2015). The research was conducted in one cycle of pre-action and two cycles consisting of planning, action, observation, and reflection. The subjects of this research were 35 students of class XI-MIPA G at SMAN 1 Kediri in the even semester of the 2022/2023 academic year. A qualitative approach was employed with observation, reflective journal, and cognitive test.

Figure 1
Classroom Action Research Activity Cycle (Kemmis & Mc. Taggart, 1992)
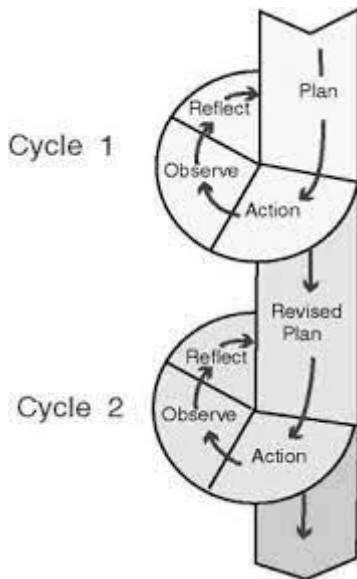
Data obtained in the form of learning outcomes through tests and student activity through observation sheets. Quantitative data analysis in the form of learning outcomes was carried out using descriptive statistical techniques with the percentage formula. Meanwhile, the description technique was used for qualitative data in the form of students' activity from the result of observation. The percentage formula used is as follows.

$$P = \frac{f}{N} \times 100\%$$

Description:
P = Percentage
f = Number of students completed
N = Number of all students

The learning outcomes data have been analysed, then interpreted and concluded into a range of grade that show the completeness of learning outcomes. Students are said to be complete if they have a score of $\leq$ 75. Learning is said to be successful if classical learning completeness is achieved at least 85% (Kemendikbud, 2015; Asiyah, 2022). The value categories used are shown in Table 1

Table 1
Category of Students' Learning Outcomes

No.	Percentage	Category	Score
1	85-100	Very Good	A
2	70-84	Good	B
3	55-69	Average	C
4	41-54	Poor	D
5	0-40	Very Poor	E

Result and Discussion

The learning was conducted in one cycle of pre-action and two cycles of action. The learning was conducted using Lesson Study, namely plan, action, observe, and reflect. The approach used was Culturally Responsive Teaching (CRT) with the stages as shown in Figure 2 presented by Gay

99

(2001) with the five stages of CRT by Hernandez et al. (2013).

Based on the results of pre-action observations, several problems were found in the classroom. Learning was conducted using the lecture method. Students feel bored with monotonous methods so that the learning motivation of students decreases. Some students did not listen to the teacher's explanation. The learning outcomes of the pre-action cycle were categorised as average with mean of 63.8. Students' learning outcomes are presented in Table 2.

Table 2
Category of Pre-action Students' Learning Outcomes

No.	Grade	Number of Achievement	Percentage (%)	Category
1	85-100	2	5.7	Very Good
2	70-84	2	5.7	Good
3	55-69	28	80.0	Average
4	41-54	0	0	Poor
5	0-40	3	8.6	Very Poor
	Total	35	100	

First Cycle

In Cycle I plan activity, teachers compiled and agreed on teaching modules and prepared learning instrument, in the form of students' worksheet, evaluation, learning media and learning material for teachers and students. The material taught was solubility and solubility product and the effect of pH on solubility.

In the action stage, students conduct a non-cognitive diagnostic test about ethnicity and learning style. This stage includes Self Identification so that students understand their own background. The test results showed that all students are Javanese. The languages understood are Indonesian and Javanese language. This shows that the ethnicity in the class is homogeneous. Meanwhile, students' learning styles consisted of 50.7% visual, 25.6% auditory, and 23.7% kinesthetic. Then, the results of the cognitive diagnostic test were used as the basis for forming heterogeneous groups of 2-4 people.

At the Culturally Understanding stage, students learn through the ethnochemistry article given entitled, "Myth or Fact: Can Drinking Coffee Tradition Cause Tooth Decay?". Students formulate problems related to culture and the chemical concepts of solubility and the effect of pH on solubility, then answer temporary conjectures through the preparation of hypotheses. Furthermore, at the Collaboration stage, students in groups are guided by the teacher to discuss the questions contained in the students' worksheet related to the ethnochemistry article given.

Figure 2
Step of CRT

100
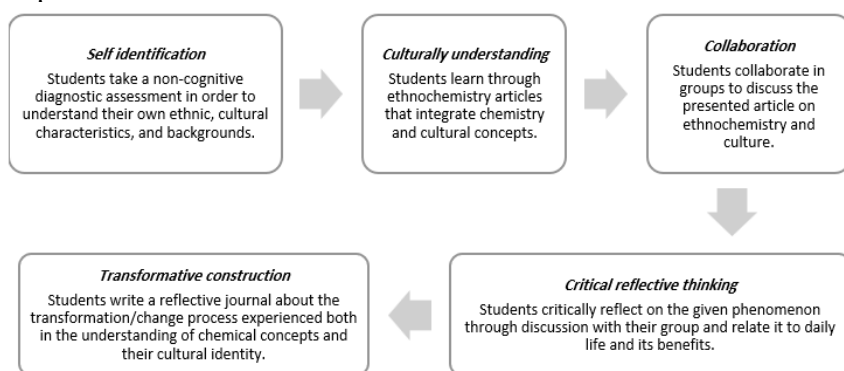
Learning in Cycle I used students' worksheet which directed learning according to the stages of CRT. Students' worksheet makes learning more meaningful, contextual and directed if it involves cultural environmental factors that are closely related to the physical and social environment of students. This makes it easier for students to connect cultural content with the chemical concepts (Nisa, Sudarmin and Samini, 2015; Utari, Andayani and Savalas, 2020). This students' worksheet contains ethnochemistry articles as discussion starters shown in Figure 3.

Figure 3
Students' Worksheet Cycle I

The cultural content used in Cycle I is the Drinking Coffee Tradition that has taken root in the community in Kediri City from various ages. Coffee contains chlorogenic acid and caffeic acid which can increase acidity in the mouth. In addition, tooth enamel, which is composed of calcium hydroxyapatite (a soluble salt in acid), can be eroded when exposed to acids or corrosive materials. Through this discussion trigger, students are invited to respond to the Drinking Coffee Tradition so as not to damage tooth enamel.

Furthermore, at the Critical Reflective Thinking stage, students develop their understanding with further questions about the concept of Solubility and the Effect of Same Ion on Solubility and its relation to daily life. Learning resources are provided so that students can explore their knowledge with differentiation based on learning styles. Flipbooks are provided for visual learning styles, videos for audio learning styles, and virtual labs for kinesthetic learning styles.

Students are directed to present their work orally. Students from other groups give appreciation, suggestions, and constructive feedback. Finally, at the Transformative construction stage, students write reflective journals about the transformation/change process experienced both in understanding chemical concepts and their cultural identity. The complete CRT stages are shown in Figure 3.

Based on the results of the learning reflection journal, students feel interested and happy when discussing using the surrounding culture that they understand. Students feel that the material learnt is very useful in their daily life. Students know what

101

to do regarding the Drinking Coffee Tradition to prevent tooth enamel damage.

The achievement of learning objectives in Cycle I reached 71.4% of 35 students. The remaining 28.6% of students still did not meet the minimum competency criteria of 75. The average score of students in Cycle I was 80.0. Another problem encountered in learning is the long time in doing the pretest because of writing essay questions on paper. In addition, some students are still not active in arguing and playing mobile phones, and the conclusions and reflections obtained are not complete so they need to be improved in the next cycle. The learning outcomes of students in Cycle I are presented in Table 3.

Table 3
Category of Student Learning Outcomes Cycle I

No.	Grade	Number of Achievement	Percentage (%)	Category
1	85-100	25	71.4	Very Good
2	70-84	0	0	Good
3	55-69	5	14.3	Average
4	41-54	5	14.3	Poor
5	0-40	0	0	Very Poor
	Total	35	100	

Second Cycle

The results of the reflection in Cycle I were improved in Cycle II. In general, the CRT stages carried out were the same as Cycle I with some improvements. The improved stages were 1) The pretest was conducted using Google Forms to streamline time, 2) Students who are not actively arguing are guided to have the courage to argue, 3) Students are directed to write complete conclusions and reflections according to learning objectives and their relation to culture, and 4) Students are directed to understand the right concept with teacher guidance.

The implementation of learning in Cycle II is better than Cycle I. Students learn the next material about Precipitation Reaction and the Effect of Same Ion on Solubility in Cycle II. The ethnochemistry article used is entitled "How are Stalagmites and Stalactites Formed in Umbul Tuk Cave, Blitar?". The location of the cave is in Blitar, next to Kediri City. So, the students feel close to the area. Furthermore, the students asked the reason why the Selomangleng Cave in Kediri City does not have stalactites and stalagmites. The article used to give a problem orientation to students. So, the students can give a solution through group discussion.

In Cycle II, students who were complete reached 100%. Students were more enthusiastic in learning in Cycle II. The average score of students in Cycle II was 89.1. The learning outcomes of students in Cycle II are presented in Table 4.

Table 4
Category of Student Learning Outcomes Cycle II

No.	Grade	Number of Achievement	Percentage (%)	Category
1	85-100	25	71.4	Very Good
2	70-84	10	28.6	Good
3	55-69	0	0	Average
4	41-54	0	0	Poor
5	0-40	0	0	Very Poor
	Total	35	100	

The teacher gives examples of problems that are closely related to students' daily life. So, the students can think critically and creatively to solve the problems given in groups (Rahmawati et al., 2019). The

discussion and presentation process went smoothly guided by the ethnochemistry article in the students' worksheet shown in Figure 4.

Figure 4
Students' Worksheet Cycle II

Students are very active when asked to present the results of their discussion. This makes the achievement of learning objectives high because students are active in the discussion and presentation process. Students also showed enthusiasm when discussing stalactites and stalagmites by asking about something they did not understand and triggering discussions with other friends.

Learning outcomes over the two cycles have improved. In Cycle I, 71.4% of students were complete with a good category. This is more improved compared to the completeness of the pre-action which reached 14.3% in the very poor category. However, the completeness in cycle I did not meet the minimum classical learning completeness of 85%. After improvements in Cycle II, students who were complete reached 100% with a very good category

exceeding the minimum classical learning completeness that had been set. The recapitulation of learning outcomes is presented in Table 5.

During the action stage, the teacher appointed a peer to conduct students-focused observations. The aspects of observation consisted of five indicators, namely activeness in doing tasks, asking questions, showing curiosity, concentrating, and having an opinion. The results of observations of students' activity in Pre-action, Cycle I, and Cycle II show an increase as shown in Table 6.

In Pre-action, the students' activity only reached 57.2 with an average category. In Cycle I, students' activity increased to 71.4 with a good category. Meanwhile, in cycle II, the students' activity showed the highest grade of 91.4.

Table 5
Students' Learning Outcomes in Pre-action, Cycle I and II

No.	Grade	Pre-action	Cycle I	Cycle II
1	Mean	63.8	79.8	89.1
2	Complete	14.3%	71.4%	100%
3	Not complete	85.7%	28.6%	0%
4	Category	Very Poor	Good	Very Good

Table 6
Student Activity in Pre-action, Cycle I and II

No.	The Aspects of Observation	Percentage (%)		
		Pre-action	Cycle I	Cycle II
1	Students do the assignments from the teacher.	60	92	100
2	Students ask the teacher or friends if there is material that has not been understood.	44	75	94
3	Students show curiosity by asking questions when the teacher opens discussion or question and answer sessions.	55	40	85
4	Students concentrate and do not make noise in the classroom.	70	80	88
5	Students communicate their answers and ideas.	57	70	90
	Mean	57.2	71.4	91.4

These results are in accordance with the results of research conducted by Rahmawati *et al.* (2019) which shows that cultural integration can increase curiosity and an open attitude to which can change values and perspectives on the culture. This change is what creates the learning process. Students also become aware and responsible for the culture they learn, and their activity in learning increases.

Conclusion

The implementation of Culturally Responsive Teaching can improve learning outcomes and students' activity in Class XI-MIPA G SMAN 1 Kediri. In Pre-action, the students' learning outcomes and activity were obtained with an average of 57.2 and 63.8. The learning outcomes of students in Cycle I obtained a mean of 80.0 with a good category and increased in Cycle II with an average of 89.1 with a very good category. In Cycle I, students' activity of 71.4 was categorised as average. Meanwhile, in Cycle II, the activeness of students increased by 91.4 in the very good category. Based on these results, teachers can implement the CRT approach on other topics to increase

students' motivation, learning outcomes, and activity. Teachers can use local culture according to the characteristics of students to increase students' closeness to their cultural context.

References

Arikunto, S. 2015. *Penelitian Tindakan Kelas*. Jakarta: Bumi Aksara.

Asiyah, S. 2022. Meningkatkan Hasil Belajar Kimia Tata Nama Senyawa Sederhana dengan Model Think-Pair-Share pada Siswa Kelas X SMA Negeri 1 Lingsar. *Reflection Journal*, 2(1), 17–25.

Badan Standar Nasional Pendidikan. 2010. *Paradigma Pendidikan Nasional Abad XXI*. Jakarta: Kementerian Pendidikan dan Kebudayaan.

Gay, G. 2001. *Culturally Responsive Teaching: Theory, Practice, and Research*. New York: Teachers College Press.

Hernandez, C. M., Morales, A. R. and Shroyer, M. G. 2013. The Development of A Model of Culturally Responsive Science and Mathematics Teaching. *Cultural Studies of Science Education*,

8(4), 803–820.

Ismawati, R. 2017. Strategi REACT Dalam Pembelajaran Kimia SMA. *Indonesian Journal of Science and Education*, 1(1), 1–7.

Kemendikbud. 2015. *Peraturan Menteri Pendidikan dan Kebudayaan Republik Indonesia Nomor 53 Tahun 2015 Tentang Penilaian Hasil Belajar oleh Pendidik dan Satuan Pendidikan pada Pendidikan Dasar dan Pendidikan Menengah*. Jakarta: Kementerian Pendidikan dan Kebudayaan.

Nisa, A., Sudarmin and Samini. 2015. Efektivitas Penggunaan Modul Terintegrasi Etnosains dalam Pembelajaran Berbasis Masalah untuk Meningkatkan Literasi Sains Siswa. *USEJ - Unnes Science Education Journal*, 4(3), 1049–1056.

Rafiuddin, R., Dali, A. and Anton, L. O. R. 2018. Penerapan Model Problem Based Learning (PBL) Berbasis Pendekatan Saintifik untuk Meningkatkan Penguasaan Konsep pada Materi Pokok Kelarutan dan Hasil Kali Kelarutan. *JRPK: Jurnal Riset Pendidikan Kimia*, 8(2), 1–10.

Rahmawati, Y., Baeti, H. R., Ridwan, A., Suhartono, and Rafiuddin. 2019. A Culturally Responsive Teaching Approach and Ethnochemistry Integration of Tegal Culture for Developing Chemistry Students' Critical Thinking Skills in Acid-Based Learning. *Journal of Physics: Conference Series*, 1402(5): 1-6.

Rahmawati, Y., Ridwan, A., Cahyana, U., and Febriana, D.. 2020. The Integration of Culturally Responsive Transformative Teaching to enhance Student Cultural Identity in The Chemistry Classroom. *Universal Journal of Educational Research*, 8(2), 468–476.

Rahmawati, Y. and Ridwan, A. 2017. Empowering Students' Chemistry Learning: The Integration of Ethnochemistry in Culturally Responsive Teaching. *Chemistry: Bulgarian Journal of Science Education*, 26(6), 813–830.

Sudiana, I. K. S., Suja, I. W. and Mulyani, I. 2019. Analisis Kesulitan Belajar Kimia Siswa pada Materi Kelarutan dan Hasil Kali Kelarutan. *Jurnal Pendidikan Kimia Indonesia*, 3(1), 1-7.

Sufyadi, S., Lambas, Rosdiana, T., Rochim, F. A. N., Novrika, S., Iswoyo, S., Hartini, Y., Primadona, M., and Mahardhika, R. L.. 2021. *Pembelajaran Paradigma Baru.* Jakarta: Badan Penelitian dan Pengembangan dan Perbukuan.

Suparlan, H. 2016. Filsafat Pendidikan Ki Hadjar Dewantara dan Sumbangannya Bagi Pendidikan Indonesia. *Jurnal Filsafat*, 25(1), 60-73.

Utari, R., Andayani, Y. and Savalas, L. R. T. 2020. Pengembangan Modul Kimia Berbasis Etnosains Dengan Mengangkat Kebiasaan Petani Garam. *Jurnal Pijar MIPA*, 15(5), 478–481.

Wiryopranoto, S., Herlina, N., Djoko, M., Tangkilisan, Y. B.. 2017. *Ki Hajar Dewantara Pemikiran dan Perjuangannya*. Jakarta: Museum Kebangkitan Nasional Direktorat Jenderal Kebudayaan Kementerian Pendidikan dan Kebudayaan.