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Analysis of Students' Learning Interest in the Implementation of the 5 E Cycle Model on Chemical Equilibrium Material

Yuyun Ernawati[1*], K. H. Sugiyarto[1], Antuni Wiyarsi[1], Jaslin Ikhsan[1]

[1] Department of Chemistry Education, Faculty of Mathematics and Natural, Universitas Negeri Yogyakarta, Yogyakarta, Indonesia.

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Corresponding Author:
Yuyun Ernawati
yuyunernawati.2021@student.uny.ac.id

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Abstract: This study aims to analyze students' learning interests in the application of the 5E cycle model to chemical equilibrium material at SMA Negeri 1 Seyegan. The research design used in this study was pre-experimental with a one-shot case study. The research sample consisted of all class X MIPA 1 students, with a total of 27 students. The sampling technique used was purposive sampling. Data collection techniques are carried out with an eye toward measuring student learning interest. The type of data analysis used is descriptive, calculating the proportion of the overall score at the level of interest in learning. The result of the study is that the level of interest in studying at SMA Negeri 1 Seyegan is in the moderate-high category.

Keywords: Learning interest; Model cycle 5 E

Introduction

Education in the 21st century creates new challenges in the world of education, today's young generation takes people through the dangers and opportunities that will come. Since the younger generation will collectively determine whether civilization survives or not, the aim of educators today is to provide them with the basis for making an intelligent and wise decision (Gentili, 2019). Competencies that occur in the 21st century include critical thinking, creativity, collaboration and complex problem solving (Chen et al., 2020). This competence increasingly makes students required to master material concepts, but before mastering material concepts, students' interest in learning is needed so that understanding material concepts is more meaningful.

Interest in learning is an important part of students to participate in the learning process, in addition to interest in learning how to deliver teacher material will also affect the success of student interest in learning (Moallem et al., 2019). Students' motivation to continue learning is influenced by their interest in learning. Sutrisno (2021) states that interest in learning is a psychological aspect that can encourage individuals to concentrate their thoughts so that they become concentrated in the learning process. Interest in learning can also arouse students' enthusiasm in carrying out further research activities to increase mastery of the material (Münkel-Jiménez et al., 2020) and student learning (Schmidt et al., 2020). Individual learning interest and self-regulation are the two pillars of independent learning (Lai et al., 2023), demonstrated interest is understood as a multidimensional construct and students' relationship with experiences while in the environment is seen as a central element (Syskowski et al., 2022). Interest is also interpreted as a mental desire that directs individuals to a choice (Rahmawati, 2021). According to Otoo et al. (2018), student learning interest is an important factor that can encourage students to learn more about something and then do it. Interest in learning is proven to have a large influence on student learning achievement (Karina et al., 2017), because if the learning material being studied is not in accordance with

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students' learning interests, then students cannot learn as well as possible (Rusmiati, 2017).

Observations were made in November 2022 at SMA 1 Seyegan using a SWOT analysis (Strengths, Weaknesses, Opportunities, and Threads). SMA 1 Seyegan is located in Sleman, has large classes, a large number of students, and qualified teachers. Internet access is not easy for students to reach, so that the role of the teacher is more dominant than the students'. The learning model used in education should focus on the teacher instead of the students so that students understand chemistry better (Sunandar et al., 2017).

Students are expected to have complete knowledge and a good understanding of chemical material so that they can relate various representations, macroscopic, submicroscopic, and symbolic, which are commonly found in everyday life. But because students think that chemical material is abstract and difficult to understand, they would be elusive and boring. This can make students' interest in learning decrease in class (Sinaga, 2022).

The cycle 5 e-learning model involves the active role of students in both offline and online learning (Sartika et al., 2023). The cycle 5 e model helps students in making decisions, and problem-solving abilities, and increases students' understanding of concepts (Bahtaji, 2021). Students must build their information about and knowledge by examining, exploring, testing, and refining student's previous knowledge (Khan et al., 2020). There are five phases in the 5E cycle model: engagement, exploration, explanation, elaboration, and evaluation (Pratama & Saputra, 2023). The cycle 5 e learning model can assist teachers in connecting the material being taught to students' real-world situations and its application in everyday life so that it can help students understand the concept of chemical equilibrium (Ramadhani, 2018). Learning models can also affect student learning interest (Rotgans et al., 2019). The purpose of this study was to analyze students' interest in learning towards the implementation of the Cycle 5E model.

Continuous material with the cycle 5 e learning model, one of which is chemical equilibrium material, is a complex material. Chemical equilibrium is one of the most difficult concepts in chemistry, due to its abstract character and the requirement to understand a large number of derivatives from equilibrium (Özmen & Naseriazar, 2018). The concept of equilibrium is an abstract with concrete examples which are considered difficult by most students, in learning objectives it is stated that students master the concept through experimentation or practicum (Minarni et al., 2023).

Therefore, several studies on chemical equilibrium have included understanding the basic concepts and developing techniques to facilitate solving problems regarding chemical equilibrium (Ollino et al., 2018). With proper guidance, students can relate themselves to the chemical equilibrium concepts they have obtained from the teacher, so that new concepts can be integrated with new knowledge (Ye et al., 2020).

Method

The research design uses quasi-experimental methods, especially with the one-shot case study, by providing treatment (an independent variable) in the form of a cycle 5 e-learning model and observing the dependent variable in the form of students' learning interest (Sugiyono, 2019). The research design used in Figure 1

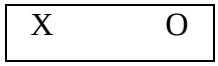

Figure 1. One-shot case study

This study was conducted in November for two weeks or two meetings for class 11 SMA 1 Seyegan, with a total of 27 students. The research instrument used was a questionnaire to measure students' interest in learning, with a total of 21 items. The analysis used is descriptive analysis by calculating the percentage of the overall score of the interest in learning questionnaire that has been filled in by students and categorized. The overall percentage equation 1.

$$\% = \frac{N}{T} \text{ x } 100\% \quad (1)$$

N = Sum of scores from students
T = Total maximum score = 105
The categories of student learning motivation are listed in Table 1.

Table 1: Category of Learner's Learning Interests

Categories	Percentage (%)
Very high	$x > 80$
High	$60 < x \leq 80$
Medium	$40 < x \leq 60$
Low	$20 < x \leq 40$
Very low	$x \leq 20$

Result and Discussion

In this study, SWOT analysis was conducted at SMA 1 reluctant. The strength analysis carried out aims to determine the strengths of SMA 1 Seyegan. The strengths possessed at the time of observation are adequate laboratory tools and materials, and teachers who are competent in their fields.

Weakness analysis aims to be able to find out the components that are not yet in school, and what you want to achieve at SMA 1 Seyegan is that laboratory facilities are adequate but chemistry teachers do not do practicums in chemistry laboratories related to chemical material. Because there are these weaknesses, the researcher wants to see the learning interests of students using the cycle 5E model, which applies learning using practicum on chemical equilibrium material. Opportunity analysis aims to analyze the main favorable situations for education (Iswandi et al., 2023).

There are relationships between components in this SWOT analysis, such as the relationship between strengths and opportunities (S-O) that exist in Seyegan 1 High School, which the researchers can take advantage of; the relationship between weaknesses and opportunities (W-O) to overcome weaknesses that occur in schools and take advantage of opportunities already existing; the relationship between weaknesses and threats (W-T) that can be used as a strategy to prevent various existing threats; and the relationship between strengths and threats (S-T) that can be used to reduce threats with the strengths possessed by SMA 1 Seyegan (Aisyi et al., 2020). This SWOT analysis can provide benefits for students and researchers in developing discussions about solving a problem and can help schools that still have weaknesses become better (Amri et al., 2020).

Figure 2. Chemical equilibrium practice

Figure 3. Chemical equilibrium practice

The dependent variable in this study is student learning motivation, which is treated using the learning model cycle 5 e. The cycle 5E model's impact on student learning outcomes in chemical equilibrium material (Prihastoto et al., 2019). The cycle 5E model is used because it can enable students to have critical thinking skills that can help them in the group work process in class (Irhamna et al., 2017; Superni, 2018). This also affects student learning outcomes because the way men and women think is also different (Izzati et al., 2019; Gunawan et al., 2020). The stages in the cognitive learning cycle aim to increase student understanding (Putra et al., 2018). The learning model using cycle 5 e is ideal in realizing learning that integrates scientific practice, disciplinary core ideas and cross-sectoral concepts (Rodriguez et al., 2019). The documentation in this syntax in Figure 2.

The next step is for the teacher to help students with the practicum by giving directions during the practicum. This is in accordance with the cycle 5 e-learning model, which provides opportunities for students to find themselves, apply, and use learning methods that can build individual understanding within the students themselves. The results of the students' interest in learning are shown in table 2.

Table 2. The Value of Students' Learning Interests

Student	Score	Category
1	74	High
2	69	High
3	70	High
4	84	Very High
5	63	High
6	85	Very High
7	67	High
8	66	High
9	85	Very High
10	78	High
11	74	High
12	77	High
13	67	High
14	78	High
15	84	Very High
16	79	High
17	78	High
18	65	High
19	69	High
20	78	High
21	81	Very High
22	77	High
23	80	High
24	71	High
25	68	High
26	66	High
27	71	High

Students' interest in learning after studying chemical equilibrium with the cycle 5E model obtained 15 students in the high category, with 12 students having an interest in learning in the good category. Based on the results of students' learning interest in chemical equilibrium material, the cycle 5E model has a positive influence on students' interest in learning chemistry, especially chemical equilibrium material. Factors that can influence the learning process consist of internal factors and external factors. Internal factors that influence the learning process are physical, psychological and fatigue factors, while external factors include family, school and community factors. Internal factors that influence the learning process are physical factors, including student learning interest. Interest in learning in question is students' interest in learning a lesson, there are students who have a high interest in learning so they can more easily understand the lesson (Harefa et al., 2023).

Conclusion

This study provides an overview of students' learning interests in chemical equilibrium materials using the cycle 5E model in the "good" category. The learning interest of students is influenced by several factors, but the teacher in the cycle 5 e-learning model has a big role to play in developing it. The researcher recommends conducting further research to compare students' learning interests in the cycle 5 model.

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The author declares no conflict of interest in this research.

References

Aisyi, G. R., & Zulkarnain, L. (2020). Swot Analysis In An Educational Institution (Case Study: Baitul Qur'an Islamic Boarding School, Depok). *Jurnal Ekonomi Dan Perbankan Syariah*, *8*(1), 85–101. https://doi.org/10.46899/jeps.v8i1.177

Bahtaji, M. A. A. (2021). The role of math and science exposure on the effect of 5e instructional model in physics conceptions. *Journal of Baltic Science Education*, *20*(1), 10–20. https://doi.org/10.33225/jbse/21.20.10

Chen, C. H., Yang, C. K., Huang, K., & Yao, K. C. (2020). Augmented reality and competition in robotics education: Effects on 21st century competencies, group collaboration and learning motivation. *Journal of Computer Assisted Learning*, *36*(6), 1052–1062. https://doi.org/10.1111/jcal.12469

Gentili, P. L. (2019). Designing and Teaching a Novel Interdisciplinary Course on Complex Systems to Prepare New Generations to Address 21st-Century Challenges. *Journal of Chemical Education*, *96*(12), 2704–2709. https://doi.org/10.1021/acs.jchemed.9b00027

Harefa, D., Sarumaha, M., Telaumbanua, K., & Telaumbanua, T. (2023). Relationship Student Learning Interest To The Learning Outcomes Of Natural Sciences. *Relationship Student Learning Interest To The Learning Outcomes Of Natural Sciences*, 240–246. https://doi.org/10.51601/ijersc.v4i2.614

Iswandi., Nyoman, N.A., Egar, N.(2023). Pengembangan Analisis SWOT dalam Perencanaan Strategik Program Sekolah Penggerak Sekolah Dasar di Kota Semarang. *Didaktik: Jurnal Ilmiah PGSD STKIP Subang*, *9*(2), 3505-3515. https://doi.org/10.36989/didaktik.v9i2.1036

Izzati, U. A., Bachri, B. S., Sahid, M., & Indriani, D. E. (2019). Character education: Gender differences in moral knowing, moral feeling, and moral action in elementary schools in Indonesia. *Journal for the Education of Gifted Young Scientists*, *7*(3), 547–556. https://doi.org/10.17478/jegys.597765

Karina, R. M., Alfiati, S., & Habibah, S. (2017). Hubungan Antara Minat Belajar Siswa Dalam Mata Pelajaran IPA. *Jurnal Ilmiah Mahasiswa Pendidikan Guru Sekolah Dasar, 2*(2, 61–77. Retrieved from https://jim.usk.ac.id/pgsd/article/view/4396/0

Khan, K., Aurangzeb, W., & Tahir, T. (2020). Effectiveness of 5 Es Learning Cycle Model on Students Learning in Physics at Secondary School Level in Pakistan. *Global Social Sciences Review*, *V*(I), 469–478. https://doi.org/10.31703/gssr.2020(v-i).48

Lai, C., Chen, Q., Wang, Y., & Qi, X. (2023). Individual interest, self-regulation, and self-directed language learning with technology beyond the classroom. *British Journal of Educational Technology*, 1–19. https://doi.org/10.1111/bjet.13366

Minarni, M., Epinur, E., Yusnidar, Y., & Ramadani, Y. (2023). Laboratorium Virtual Berbasis Adobe Flash

CS6 Profesional Materi Kesetimbangan untuk Kimia Dasar I Prodi Pendidikan Kimia. *Jurnal Zarah, 11*(1), 53-61. https://doi.org/10.31629/zarah.v11i1.4810

Moallem, M., Hung, W., & Dabbagh, N. (2019). *Effects of Problem-Based Learning on Motivation, Interest, and Learning From Curriculum-Level Studies*.

Münkel-Jiménez, M., Bonilla-Araya, M., Grey-Pérez, A. D., & Herrera-Sancho, O. A. (2020). Awaking Interest in Science Learning: Hands-On Photosynthesis Demonstrations Using Elodea canadensis and Spinacia oleracea. *Journal of Chemical Education*, *97*(2), 457–461. https://doi.org/10.1021/acs.jchemed.9b00216

Ollino, M., Aldoney, J., Domínguez, A. M., & Merino, C. (2018). A new multimedia application for teaching and learning chemical equilibrium. *Chemistry Education Research and Practice*, *19*(1), 364–374. https://doi.org/10.1039/c7rp00113d

Otoo, D., Iddrisu, W. A., Kessie, J. A., & Larbi, E. (2018). Structural Model of Students' Interest and Self-Motivation to Learning Mathematics. *Education Research International*. https://doi.org/10.1155/2018/9417109

Özmen, H., & Naseriazar, A. (2018). Effect of simulations enhanced with conceptual change texts on university students' understanding of chemical equilibrium. *Journal of the Serbian Chemical Society*, *83*(1), 121–137. https://doi.org/10.2298/JSC161222065O

Pratama, A. R., Iswandi, I., Saputra, A., Hasan, R. H., & Arifmiboy, A. (2023). Pengaruh Model Pembelajaran Learning Cycle 5E terhadap Aktivitas Belajar Pendidikan Agama Islam dan Budi Pekerti di SMA Negeri 4 Kota Bukittinggi. *CENDEKIA: Jurnal Ilmu Sosial, Bahasa dan Pendidikan, 3*(1), 16-28. https://doi.org/10.55606/cendikia.v3i1.642

Putra, F., Nur Kholifah, I. Y., Subali, B., & Rusilowati, A. (2018). 5e-Learning Cycle Strategy: Increasing Conceptual Understanding AND Learning Motivation. *Jurnal Ilmiah Pendidikan Fisika Al-Biruni*, *7*(2), 171. https://doi.org/10.24042/jipfalbiruni.v7i2.2898

Rahmawati, T.F.(2021). Pembelajaran untuk Menjaga Ketertarikan Siswa di Masa Pandemi. Yogyakarta: UAD Press

Ramadhani, R. (2018). The enhancement of mathematical problem solving ability and self-confidence of students through problem based learning. *Jurnal Riset Pendidikan Matematika*, *5*(1), 127–134. https://doi.org/10.21831/jrpm.v5i1.13269

Rusmiati. (2017). Pengaruh minat belajar terhadap prestasi belajar bidang studi ekonomi siswa MA Al Fattah Sumbermulyo. *Jurnal Ilmiah Pendidikan Dan Ekonomi*, *1*(1), 21–36. Retrieved from http://journal.stkipnurulhuda.ac.id/index.php/utility

Rodriguez, S., Allen, K., Harron, J., & Qadri, S. A. (2019). Making AND THE 5e Learning Cycle. *The Science Teacher*, *86*(5), 48–55. https://doi.org/10.2505/4/tst18

Rotgans, J. I., & Schmidt, H. G. (2019). Effects of Problem-Based Learning on Motivation, Interest, and Learning. *The Wiley Handbook of Problem-Based Learning,* 157–179. https://doi.org/10.1002/9781119173243.ch7

Schmidt, E., Vik, R., Brubaker, B. W., Abdulahad, S. S., Soto-Olson, D. K., Monjure, T. A., Battle, C. H., & Jayawickramarajah, J. (2020). Increasing Student Interest and Self-Efficacy in STEM by Offering a Service-Learning Chemistry Course in New Orleans. *Journal of Chemical Education*, *97*(11), 4008–4018. https://doi.org/10.1021/acs.jchemed.9b01140

Sartika, R. P., Rasmawan, R., Hairida, H., Masriani, M., Puspasari, Y., Destari, H. U., ... & Hafiz, M. I. A. (2023). Implementasi Model Learning Cycle 5E Secara Daring dalam Meningkatkan Pemahaman Konsep Asam Basa. Edukatif: Jurnal Ilmu Pendidikan, *5*(1), 500-507. https://doi.org/10.31004/edukatif.v5i1.4729

Sinaga, K. (2022). Mental Models in Chemistry: Prospective Chemistry Teachers' Mental Models of Chemical Equilibrium. *JPPS (Jurnal Penelitian Pendidikan Sains)*, *11*(2), 113–129. https://doi.org/10.26740/jpps.v11n2.p113-129

Sugiyono. (2019). Metode Penelitian Kuantitatif, Kualitatif dan Kombinasi. Bandung: PT. Alfabeta

Sunandar, Buchori, A., Rahmawati, N. D., & Kusdaryani, W. (2017). Mobilemath (mobile learning math) media design with seamless learning model on analytical geometry course. *International Journal of Applied Engineering Research*, *12*(19), 8076–8081. Retrieved from https://www.ripublication.com/ijaer17/ijaerv12n19_11.pdf

Superni, S. (2018). Pengaruh Model Siklus Belajar 5E (Engagement, Exploration, Explanation, Elaboration, Evaluation) terhadap Kemampuan Berpikir Kritis dan Penguasaan Konsep IPA. *International Journal of Elementary Education*, *2*(2), 115. https://doi.org/10.23887/ijee.v2i2.14413

Sutrisno. (2021). *Meningkatkan Minat dan Hasil Belajar TIK Materi Topologi Jaringan dengan Media Pembelajaran*. Malang: Ahlimedia Press

Syskowski, S., Kunina-Habenicht, O., Ducci, M., &

Wagner, I. (2022). Teaching-learning laboratory "makeScience!" and students' interest – Studies on the learning environment "Donor-Acceptor Reactions – placed in Bubble Tea Balls." *Chemkon*, *29*(6), 639–645. https://doi.org/10.1002/ckon.202000081

Ye, L., Eichler, J. F., Gilewski, A., Talbert, L. E., Mallory, E., Litvak, M., M. Rigsby, E., Henbest, G., Mortezaei, K., & Guregyan, C. (2020). The impact of coupling assessments on conceptual understanding and connection-making in chemical equilibrium and acid-base chemistry. *Chemistry Education Research and Practice*, *21*(3), 1000–1012. https://doi.org/10.1039/d0rp00038h