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Research Article

Cooperative Learning in Schools

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ABSTRACT

The selection of chemical learning models that teachers typically use does not consider students' personalities, resulting in less than optimal learning objectives. The researchers attempted to take the students' personalities into account when selecting a learning model in this study. This study employs two models: the inside-outside circle and the snowball throwing. Thus, the purpose of this study was to determine the difference in chemistry learning outcomes between students with extroverted and introverted personalities who were taught using the inside-outside circle and snowball throwing learning models, respectively. A quasi-experiment was used as the research method. The hypothetical findings of this study indicated that there were differences and influences in learning outcomes between groups of students with extroverted and introverted personalities who were taught using the inside-outside circle and snowball throwing learning models. This study demonstrates that for students with extroverted personalities, the chemistry learning outcomes associated with an inside-outside circle learning model are significantly greater than those associated with snowball throwing learning models. The Snowball Throwing learning model produces superior chemistry learning outcomes for students with introverted personalities than the Inside-Outside Circle learning model.

Keyword: Chemistry Learning Outcomes, inside outside circle, snowball throwing, and student personality.

INTRODUCTION

Learning should be enjoyable and ongoing, as students arrive at school with various experiences and complex patterns of behaviour stored in their memories. Teachers should consider all of these factors carefully to identify the most appropriate learning patterns for each student. However, in practice, teachers continue to employ unvarying and straightforward learning models. Teachers' instructional strategies are frequently incompatible with real-world experiences. Additionally, there is a problem with student retention. This is demonstrated by the average student's constantly fluctuating learning outcomes. This demonstrates that the

educational process has harmed students' ability to develop independence through discovery in their thought processes to this day.

According to the results of interviews with chemistry teachers at SMA Negeri 5 Lubuklinggau, the average daily score on the daily chemistry test for odd semester students in grade XI natural sciences in the 2018-2019 school year was 54.56. The score was calculated using 144 students who earned a score greater than 76, or up to 64 individuals (44.44 %). The score falls short of the teachers' and schools' Minimum Completion Criteria. The minimum completion standard for schools is that 80% of students earn a score of at least 76.

According to researchers' observations of the practice of chemistry learning at SMA Negeri 5 Lubuklinggau, learning is predominantly teacher-centred. Students listen more intently and take notes on the teacher-provided material, resulting in students becoming passive, disoriented, and suffocated. Teachers should motivate students, express ideas, utilize appropriate learning media, select appropriate approaches and learning models, and develop material concepts that are simple to comprehend and meaningful. Additionally, teachers should select an appropriate learning model for their students, plan and implement learning processes that engage students actively in the learning process. To foster an environment that is active, effective, efficient, enjoyable, and meaningful.

When all environmental factors are considered, they can contribute to establishing a conducive and high-quality learning environment. Setting can foster a calm, pressure-free environment that motivates students to learn effectively. To create an active learning environment (one that engages students), it is necessary to consider studying rooms and school furniture. The arrangement should encourage the grouping of students and make it easier for teachers to guide and assist students with their learning. Group table arrangements can help students work together more effectively. The development of students' passion for learning will undoubtedly affect the effectiveness of their education. A reasonable, pressure-free learning environment will undoubtedly foster students' critical thinking abilities and creativity.

Teachers must recognize that students enter the classroom with unequal knowledge, desires, and responsibilities for learning, and they must encourage students to foster creativity in developing their ideas. Each student's ability to cooperate and complete tasks in groups will undoubtedly result in a range of responses to the learning outcomes. Students' comprehension skills for receiving lessons must be enhanced, and students' active participation in expressing their opinions must be honed to match their cognitive and affective abilities. Similarly, interpersonal skills must be developed because taking action to accomplish goals requires collaboration.

A cooperative learning model was used to make the delivery of chemical materials more exciting and meaningful. Cooperative learning is a type of learning that involves the formation of groups to improve learning outcomes and foster social skills developed through group cooperation. Cooperative learning fosters cooperation, critical thinking, and the development of students' social attitudes, as demonstrated by their mutual assistance in resolving problems while maintaining mutual respect. Cooperative learning may facilitate students' comprehension of

lessons by participating actively in the learning process. Additionally, cooperative learning incorporates students' affective characteristics, which keeps lessons exciting and enables students to focus on ongoing learning for more extended periods. Cooperative learning, also known as group cooperation, is based on the premise that students will find and understand complex concepts more quickly if they discuss them with their friends. Students frequently collaborate in groups to assist one another in resolving complex problems.

Classroom learning is dominated during this period by understanding behaviourism, which aims to help students remember information, and then there is curation. This is not the case when using a snowball throwing model. Students are given the freedom to construct or create knowledge, in this case, by attempting to give meaning to the knowledge they encounter. Students are taught that science is inherently unstable and exists solely in the form of recordings. Science results from human beings acquiring new experiences, which results in the evolution of knowledge over time. The principle of learning with a snowball throwing model is encapsulated in a cooperative learning model founded on five guiding principles: active learning students, cooperative learning, participatory learning, reactive teaching, and learning.

The Learning with snowball throwing model employs three learning applications: knowledge is gradually built and expanded through cooperation in a limited context. Students are expected to acquire knowledge and skills, not through memorization of facts, but through discovery (inquiry), the knowledge that a person possesses, always beginning with "questioning"; through questioning, students can multiply information, confirm what is already known, and direct attention to unknown aspects. The snowball throwing learning model prioritizes acquiring and deepening knowledge over the amount of knowledge that students acquire and remember.

When used properly, the inside-outside circle learning model is dynamic. This model provides numerous opportunities for students to collaborate and share information simultaneously. Additionally, students collaborate in a mutually beneficial environment and are provided with numerous opportunities to process information and improve communication skills. Because personality is an abstract concept with numerous distinct characteristics, experts providing insight vary significantly according to their theoretical perspectives or methodological studies of research used. However, personality can be defined as any organized behaviour unique to and settled within an individual's ability to respond to stimulation from within and without that is influenced by heredity and environmental factors.

According to the findings of (Qomariah 2016), students with extrovert personalities have relational understanding when reading and exploring problems, when developing a plan/strategy for solving problems, and when implementing a plan for solving problems. The extrovert subjects have an instrumental understanding when they look back and reflect on their results. The introverted subject has a relational understanding due to the description of the introverted subject when reading and delving into the problem. Introverted subjects have a relational understanding of developing a plan or strategy to solve a problem. The introverted subject has a relational understanding at the stage of implementing a plan to resolve the problem. While the

introverted subject has a relational understanding during reflection and looking back, the extroverted subject does not.

According to research conducted by (Ahmad Amin, Leo Charli, and Wenda Nov Fita, 2018), the results is physic learning achievement with Jigsaw method was higher than conventional method. According to research conducted by (Raguwan, Gonggo, Siang Tandi, and Sabang, 2014), the results of learning with a cooperative learning model of the snowball throwing type are superior to those of conventional learning with a high value in the area of rejection. Ho. T count is 5.65 and 1.671 at a 5% significance level and Dk = 58, respectively, indicating that the hypothesis is valid at a 95% confidence level. Thus, the snowball throwing cooperative learning model has a beneficial effect on students' learning outcomes when using molecular form materials in class XI Natural Sciences SMAN 1 Pasangkayu.

According to research conducted by (Andhika, Suardika, and Wiyasa, 2013), there are significant differences in the learning outcomes of Social Knowledge students who are studied using cooperative learning models type Inside Outside Circle based on audiovisual animation media with learning can be recommended that cooperative learning models type Inside Outside Circle based on audiovisual animation media with learning.

According to the preceding description, comparing the learning model inside the outside circle to the snowball throwing learning model has never been conducted previously. Along with comparing learning outcomes using the inside-outside circle learning model, the snowball throwing learning model distinguishes this study by examining student personality, specifically how students with an extrovert and introverted personality are studied using the inside-outside circle learning model, and then how students with an extrovert personality are studied using the inside-outside circle learning model. Along with comparing learning outcomes for students with extroverted and introverted personalities, the researchers compared learning outcomes for students using the inside-outside circle and snowball throwing learning models. While this research has been conducted in the Lubuklinggau city of South Sumatra Province in place and time, it has never been conducted there. Based on these considerations, additional research is needed to determine the effect of a student's learning model and personality on a high school chemistry study results.

METHOD

This study employed a pseudo-experimental design with a two-by-two factorial treatment. This selection is made based on the course of treatment. On this basis, the experimental design treatment is a 2 x 2 factorial. The research variables examined were learning models as unrestricted variables, students' personalities as moderator variables or attributes, and learning outcomes as restricted variables. The learning model variable (A) consists of an inside-outside circle (A1) learning model and a snowball throwing (A2) learning model. Student personality variables (B) consist of extrovert personality (B1), introvert personality (B2).

The target population for this study was all students enrolled in the 2019/2020 school year at SMA Negeri 5 Lubuklinggau. The affordable population for this study was grade XI Natural

sciences SMA Negeri 5 Lubuklinggau students, which consisted of four classes with a total of 144 students.

Sampling is carried out using a simple random sampling method.

This sampling technique is used because the population is sampled randomly regardless of the population's strata. The sampling procedures are as follows: (a) The class that will be used as a research object is determined using simple random sampling; (b) class XI Natural Science is established, consisting of four classes with a total of 144 students as respondents. This determination is made on the assumption that grade X students are unfamiliar with chemistry, whereas grade XII students are not permitted due to their preparation for the National Examination (UN); (c) Select the class for research and then conduct a simple random sampling of two classes of four. Two predetermined classes, divided into experimental groups that use the inside-outside circle learning model and an experimental group that uses snowball throwing learning models; (d) Once a class sample has been obtained, the next step is to determine the group of students using a personality questionnaire. Divide each experimental group into two subgroups: those with extroverted personalities and those with introverted personalities.

When it comes to data analysis, two requirements must be met: normality and homogeneity. The normality of the homogeneity test is used to determine the data analysis requirement. To derive conclusions from the testing of this research hypothesis, hypothesis testing is necessary. The researchers used two-way variant analysis to test hypotheses in this study (ANOVA). A two-way ANOVA was used to test hypotheses regarding average differences between sample groups.

The analysis's findings should demonstrate the significance of differences in student learning outcomes between the inside-outside circle and snowball throwing learning models. Following that, a group of students with extroverted personalities was separated from students with introverted personalities.

After verifying the analysis requirements, hypothesis testing is performed. The research hypothesis is developed into a statistical hypothesis first.

RESULTS AND DISCUSSION

The purpose of this study is to determine and analyze the following: (1) Differences in chemistry learning outcomes between groups of students studied using inside outside circle and snowball throwing learning models; (2) Differences in chemistry learning outcomes between groups of students with extroverted and introverted personalities; (3) The influence of interaction between the learning model and the student's personality on the results of chemistry study; (4) Differences in chemistry learning outcomes between groups of students who are taught using the inside outside circle learning model and those taught using the snowball throwing learning model, in students who have extroverted personalities; (5) Differences in chemistry learning outcomes between groups of students who are taught using the inside outside circle learning model and those taught using the snowball throwing learning model, in students who have introverted personalities; (6) Differences in chemistry learning outcomes between students who have

extroverted personalities and those with introverted personalities in groups of students who are taught using the inside outside circle learning model; (7) Differences in chemistry learning outcomes between students who have extroverted personalities and those with introverted personalities in the group of students who are taught using snowball throwing learning models.

1. The inside-outside circle and snowball throwing learning models both affect the outcomes of chemistry instruction.

The two-line variance analysis on line A revealed that the calculated F was 6,140 greater than the Ftabel (0.05; 1:71) = 3.98 with a probability value (Sig.) of 0.016 less than the significant level (0.05). This demonstrates that the inside and outside circle learning models and the snowball throwing learning model all produce significant differences in students' chemistry learning outcomes.

The findings of this study corroborate previous research Afidah et al. (2018), indicating that the Inside-Outside Circle learning model affects students' interests and learning outcomes when it comes to photosynthesis materials. This is demonstrated by the experimental class's average N-Gain yield of 0.67 medium categories, compared to the 0.39 medium category for the control class. The N-Gain value is a statistically significant difference between the experimental and control groups, as determined by statistical tests. The experiment class averaged 62.61 per cent, while the control class averaged 45.57 per cent. The interest score statistics test reveals significant differences, indicating that the Inside-Outside Circle model affects students' learning interests.

According to Rohmawati 2018, the learning model used within the Outside Circle affects students' activeness and academic achievement. Based on observations of students' learning activities, the average obtained in the experimental class was 73.88 per cent. This could mean that the level of student learning activity in experimental classrooms accounts for 73.88 per cent of students' achievement in math.

According to the research conducted by Saputri et al. (2018), there was a significant difference in the results and interests of chemistry learning students who used snowball throwing and talking stick learning models in the 2013 curriculum. Both classes' learning outcomes are improving. This is evident from the average pretest and post-test scores for the 22,879 and 79,848 snowball throwing classes, respectively. Pre- and post-test scores for talking stick classes were, on average, 31,818 and 77,424. While interest in studying chemistry for snowball throwing classes increased by 81.567 per cent and can be classified as excellent, interest in studying chemistry for talking stick classes increased by 75.373 per cent and can be classified as excellent. This demonstrates that snowball throwing instructional models affect students' learning outcomes and interests.

Based on the research conducted and the findings of previous studies, it can be concluded that both the inside-outside circle and snowball throwing learning models have the potential to influence and improve students' chemistry learning outcomes.

2. There is a distinction between the outcomes of chemistry learning for students with an extrovert personality and students with an introverted personality

The two-line variance analysis on line B revealed that the calculated F was 4,750 greater than Ftabel (0.05; 1:71) = 3.98, with a probability value (Sig.) of 0.033 less than the significance level (0.05). This indicates that the results of the students' chemistry studies revealed significant distinctions between extroverted and introverted personalities.

Tjasmadi et al. (2018) Discovered that active learning methods, such as clicks and suckers, foster an environment conducive to learning for both extroverted and introverted students.

Diverse personalities in a class are not an impediment but a challenge for a teacher to develop more effective methods of instruction for all students. As a result of the research conducted and the data presented previously, it is concluded that the active learning loop and zoom method can be used to create a learning environment that is inclusive of all existing students, both extroverts and introverts.

According to research conducted by Rahayu et al. (2017), both introverted and extroverted students could locate all of the information contained in a given problem. Additionally, introverted and extroverted students can associate data by formulating solutions to problems. The assertions made by introverted and extroverted students are also valid, provided they are backed up by a logical reason involving a regularity that accurately describes the characteristics of the given problem. Introverted and extrovert students alike can demonstrate evidence and reasoning for the truth of a statement when examining the validity of an argument. Introverted students are also capable of deriving conclusions from statements provided with supporting evidence. However, extroverted students cannot do so when the evidence provided does not support the conclusions reached.

Based on the research conducted and the findings of previous studies, it can be concluded that extroverted and introverted personalities can influence and improve students' chemistry learning outcomes.

3. The learning model and the students have an interaction effect on the chemistry learning outcomes.

The A * B Interaction row's two-way analysis of variance revealed that the interaction F count of 29.883 was greater than F (0.05; 1:71) = 3.98 with a probability value (Sig.) of 0.000, which was less than the significant level. This indicates that the learning model has a significant interaction effect on student chemistry learning outcomes.

According to Habibi (2016) research, there are differences in the main system of linear equations learning outcomes for junior high school students with extroverted and introverted personalities. As evidenced by the study's findings, namely that the magnitude of the t-test is 5.082 and the t-table is 2.045, it appears that at the 5% level of significance, the t-test > the t-table, implying that Ha is accepted and Ho is rejected. The findings of this study indicate that there are significant

differences in the mathematics learning outcomes of extroverted and introverted junior high school students when it comes to linear equation systems.

According to research conducted by Yanti et al. (2018), PBL plays a critical role in learning because it encourages introverted students to take an active role in solving given contextual problems, thereby improving students' mathematical critical thinking skills at the end of the learning process. The data gathered through tests, observations, and interviews attest to this. Additionally, the data collected during the research process was analyzed using two significant conditions: analysis within conditions and analysis. Multiple conditions (interval length), directional tendencies, levels, rates of change, data trails, and timescales are included in the analysis under conditions. Analysis of the conditions under which variables are changed, changes in trend direction and their consequences, changes in coverage and consequences, data on the magnitude of change, and overlapping data. The study concludes that students with introverted personalities can use the PBL model to solve problems presented in Pythagorean theorem materials. The results of the pre-and post-treatment evaluations indicated a significant increase in critical thinking abilities, indicating that the treatment effectively improved the mathematical critical thinking abilities of introverted students.

According to Hakim (2019) research, cooperative learning methods may be a viable option for speaking classes. The researchers observed and interviewed five English teachers at the Bengkulu English Academy who had more than five years of experience teaching English, including speaking lessons. Fifteen meetings in five distinct speaking classes were observed. The researcher concentrated on the situation and activities preceding and during the class, on the problems that appeared to be encountered by introverted students, and on what the teachers did next. Concerning the activities in these speaking classes, the researchers discovered that introverted students would genuinely feel at ease if their teachers provided them with additional opportunities to interact with other students, as they genuinely require such opportunities. According to research conducted by (Leo Charli, Moch Sukardjo, and Suyitno Muslim, 2021) the results is the chemistry learning outcomes of students who had students personalities can increasing using cooperative learning models.

Additionally, this action will be critical for these introverted students to improve their speaking abilities. However, the primary issue is that they are frequently hesitant to respond directly to topics discussed, resulting in a lack of intensity in their teaching and learning processes. Additionally, these students had the opportunity to inform the author that the materials taught should include more activities, such as current games designed to increase student interaction in a fun way. On the other hand, these introverted students would much rather learn through activities than through lectures. As a result, teaching materials must also reflect the teachers' suggested competencies for cooperative learning.

According to the findings of this study and those of previous researchers, there is a significant interaction effect between learning models and personality on student chemistry learning outcomes.

4. **For students with extroverted personalities, the inside-outside circle learning model produces superior chemistry learning outcomes than the snowball throwing learning model.**

The Dunnet t-test results on the chemistry learning outcomes of extroverted students indicate that t count = 4.462 is greater than t table (0.05; 71) = 1.99 with a probability value of Sig. (2-tailed) of 0.000, which is less than the significant level (0.05). This means that for groups of students with extroverted personalities, there are differences in the chemistry learning outcomes of students who learn to use the inside-outside circle and those who learn to use the snowball throwing learning models.

According to research conducted by (Nuraeni, Dewi, Utaya, Sugeng, & Akbar, 2017), the inside-outside circle learning model can increase learning activities through Lesson Study (LS) activities. It is critical to implement IOC learning to maximize student learning activities throughout the learning process. This study used LS in conjunction with Classroom Action Research to collect data (CAR). For a total of 24 students in class VA, LS activities were held at SDI Surya Buana. The data was gathered through observations of students engaged in learning activities during the learning process. The findings indicated that (1) with a more mature planning and preparation process, students' activities could be more optimal, and (2) LS activities could assist teachers in developing more effective learning activities.

According to Aditya et al. (2020), the snowball throwing learning model can help students improve their English descriptive writing outcomes. This study demonstrates an increase in observed results. From the first to the second meeting, activity increases significantly. Additionally, after being taught using the snowball throwing learning model, students' descriptive writing outcomes improved.

Based on the findings of this study and previous research, it can be concluded that the Inside-Outside Circle and Snowball Throwing learning models can potentially influence and improve student learning outcomes. However, for students with extroverted personalities, the learning outcomes associated with the inside-outside circle learning model are superior to those associated with the snowball throwing learning model.

5. **For students with introverted personalities, students' learning outcomes taught using the inside-outside circle learning model are lower than those taught using the snowball throwing learning model.**

The Dunnet t-test revealed that t count = -4.071 is less than t table (0.05; 71 = -1.99 with a probability value of Sig. (2-tailed) of 0.000 is less than the significant level (0.05). This means that for groups of students with introverted personalities, there are differences in the chemistry learning outcomes of students who learn to use the inside-outside circle learning model versus those who learn to use the snowball throwing learning model.

According to Maulida et al. (2013), using the inside-outside circle learning model in the classroom can help students improve their speaking skills. This instructional model teaches students, particularly junior high school students, to think critically and collaborate to interact with their interlocutors more confidently and without fear of speaking. Not only that, but students become more accustomed to expressing their opinions or ideas about the topics being discussed as a result of this learning model, making it easier for students to convey their ideas and opinions.

According to research conducted by (Nurhidayati et al., 2019), implementing the snowball throwing learning model can help grade VIII students improve their social studies learning outcomes. The study collected data through observation, interviews, tests, and documentation. The type of data analysis that was used was descriptive qualitative analysis. The study's findings were demonstrated in student learning outcomes before and following the snowball throwing learning model, specifically that the learning outcomes of students who received the KKM score increased from 38.09 per cent to 52.38 per cent in the first and 86.70 per cent in the second cycle. Based on the findings of this study, it can be concluded that implementing the Snowball Throwing Cooperative Learning model can help students in class VIII C SMP Muhammadiyah 1 Sukoharjo improve their geography social studies learning outcomes in the 2017/2018 academic year.

According to Piliani et al. (2019), information services affected class VIII students' introverted nature at SMPN 2 Praya Timur, Central Lombok Regency, during the 2015/2016 academic year. The data are analyzed using the t-test; the t count value is greater than the t table value at a 5% significance level with db = 30-1 people; the t count value is 8.152> t table 2.045, indicating that the results of this study are significant, rejecting the null hypothesis (Ho) and Ha concurred.

Based on the findings of this study and those of previous researchers, it can be concluded that the snowball throwing and inside-outside circle learning models can potentially influence and improve student learning outcomes. However, for students with introverted personalities, student learning outcomes using the snowball throwing learning model are superior to those using the inside-outside circle learning model.

6. In the group of students taught using the inside-outside circle learning model, students with extroverted personalities outperform students with introverted personalities in terms of chemistry learning outcomes.

The Dunnet t-test results indicate that t count = 5.318 is greater than t table (0.05;71) = 1.99 with a probability value of Sig. (2-tailed) of 0.000 is less than the significant level (0.05). This means that for groups of students who learn to use the inside-outside circle learning model, there are differences in the chemistry learning outcomes of extroverted and introverted students.

According to Septiawati (2017) research, extrovert personality and social support affect student interest in entrepreneurship. The findings indicated that social support and extrovert personality together had a significant effect on entrepreneurial interest, accounting for 0.302 or 30.2 per cent

of the variance. Social support for entrepreneurial interest affects entrepreneurial interest, with R Square indicating a magnitude of 0.279 or 27.9 per cent. Entrepreneurial interest is influenced by extrovert personality, with R Square indicating a magnitude of the contribution of 0.083 or 8.3 per cent.

According to Widayanti (2016) research, the ability level of junior high school students with introverted personalities can be described using the SOLO taxonomy. Researchers hope that teachers can use the SOLO taxonomy model to observe students' problem-solving processes and use this information to develop lesson plans that will assist students in mastering the material.

According to the research conducted by Ariasih et al. (2018), the Inside-Outside Circle learning model based on indigenous wisdom had a significant effect on mathematics learning outcomes in elementary school students in class V cluster I Buleleng District. The results of hypothesis testing indicate that t count (6.40) is greater than t table (2.021) (t count > t table), which was verified using db 40 at a 5% significance level. As a result, it can be concluded that the wisdom-oriented Inside Outside Circle learning model has a significant impact on the learning outcomes of fifth-grade elementary school students in Cluster I, Buleleng District.

Based on the findings of current research and previous research, it can be concluded that both extrovert and introvert personalities can influence and improve student learning outcomes. However, in students using the inside-outside circle learning model, students with extroverted personalities achieve higher learning outcomes than students with introverted personalities.

7. In the group of students taught using the snowball throwing learning model, and student chemistry learning outcomes are lower for students with extroverted personalities than students with introverted personalities.

The Dunnet t-test results on the chemistry learning outcomes of students who learned to use the snowball throwing learning model revealed that t count = -2.521 is less than t table (0.05;71) = -1.99, with a probability value of Sig. (2-tailed) of 0.014 is less than the significant level (0.05). This means that for groups of students who learn to use the snowball throwing learning model, there are differences in the chemistry learning outcomes of students with extroverted and introverted personalities.

According to research conducted by Hastuti et al. (2018), the respondents in this study were students with an average age of 15.53, and 90.6 per cent of them were female; the personality types of adolescents at SMKN 1 Jogonalan are predominantly introverted (60 per cent), and the majority of adolescents at SMKN 1 Jogonalan experience high levels of stress. The fact that p = 0.003 demonstrates this (0.05).

According to research Gani et al. (2017), the snowball throwing learning model can help students improve their reading skills in English subjects. This is demonstrated by the t-test result being more significant than the critical value of 2.00. The post-test t-count value was 3.38, and the significance level was 0.61 (= 0.05) between the experimental and control groups.

Based on the findings of current research and previous research, it can be concluded that both extrovert and introvert personalities can influence and improve student learning outcomes. However, in students using the snowball throwing learning model, the learning outcomes of students with extroverted personalities are lower than those with introverted personalities.

CONCLUSION

Based on the data obtained and discussion of the results of the research, the following conclusions are presented: (1) There is an influence of inside-outside circle learning model, snowball throwing learning model, on chemistry learning outcomes; (2) There is a difference between students who have an extrovert personality and students who have introverted personalities towards the results of chemistry learning. (3) There is an influence of interaction between the learning model and the student's personality on the results of a chemistry study. (4) The results of the chemistry study of students who are taught using the inside-outside circle learning model are higher than those taught using the snowball throwing learning model in students who have an extroverted personality. (5) The results of the chemistry study of students who are taught using the inside-outside circle learning model are lower than those taught using the snowball throwing learning model in students who have an introverted personality. (6) The chemistry study results of students who have extroverted personalities are higher than students who have introverted personalities in the group of students who are taught using the inside-outside circle learning model. (7) The chemistry study results of students who had extroverted personalities were lower than students who had introverted personalities in the group of students who were taught using snowball throwing learning models.

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