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Relationship Between Learners' Social Interaction and Science Achievement: Its Implications on Junior High School Science Curriculum

Roanne Leanel Jaboneta Sarabia
Jaro National High School, Philippines
rhoane.jaboneta23@gmail.com

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ABSTRACT

This study aimed to identify the relationship of learners' social interaction and science achievement among the junior high school learners in single-gender and co-educational type of school. Through mixed-method approach, the study collected data from 30 Grade 9 students, evenly divided across single-gender and co-education. Results revealed significant differences in both social interaction and science achievement across school types, with single-gender learners exhibiting higher levels of science achievement. There was no significant relationship found between academic achievement and social interaction. Qualitative data underscored the significance of gender-based interactions on both science achievement and social interactions. The findings have significant implications for the development of an inclusive science curriculum that enhances both science and social outcomes, promoting equitable learning opportunities for all learners.

Keywords: *Social interaction, Science achievement, Science curriculum*

INTRODUCTION

Schools provide the skills and knowledge necessary for social and cognitive development, engage learners in ongoing interactions with their peers, which shape learners emotionally and socially, and allow learners to socialize using the existing norms and values of their communities, cultures, and of larger society. According to John Dewey (1922 as cited by Celestine Laure, 2019), the school is specifically designed to foster the learners' mental and moral dispositions. Science achievement equips learners for the challenges and opportunities ahead, as evidenced by the positive impact of science-based interventions, such as reducing smoking rates, on societal outcomes (Edify World, 2022).

In most schools in the world, co-education has been the norm. Co-education refers to an educational system where both male and female students attend the same institutions. Its advantages include fostering mutual respect between genders, enhancing socialization skills, and preparing students for real-world scenarios. However, a downside of co-education is the potential for gender bias and distractions (*Co-Education History*, 2023*)*. Thus, since the sole motivation of facilitators is to maximize academic achievement and cognitive development, establishments of single-gender education become an option to teach learners the necessary skills and knowledge.

Single-sex education allows students to learn in an environment free from distractions, emphasizing academic performance over social interaction. Single-sex education refers to an educational setup where only one gender is admitted. For instance, there are girls' schools where boys are not enrolled, and vice versa. Some educational institutions have separate boys' and girls' schools located in different areas, aiming

to provide a conducive learning environment for both students and teachers (Falcons School, 2021). Research has shown that single-gender schools improve academic performance, attendance, disciplinary problems, and positive attitudes. Bauzie (2014) claimed that since the learners have great academic performance, this would lead to higher career aspirations. However, some researchers argue that single-sex schools negatively impact social growth and may promote sexism, while coeducational schools promote interpersonal skills and prepare learners for a diverse society (Saunders, 2017).

Despite the respective advantages and disadvantages of single-gender education and co-educational schools in promoting scientific achievement and social interactions in their learners, a research gap remains as to the lack of literature exploring which type of schools has a better effect on these variables, especially in the local context. In this aspect, the research aimed to investigate the relationship between the junior high school learners' social interaction and science achievement in single-gender education and co-educational schools, along with the implications on the junior high science curriculum. Specifically, this research aimed to investigate the performance and responses of Grade 9 learners in single-gender education and co-education schools.

By shedding light on the link between these variables, the research aspired to offer valuable insights for curriculum developers, educators, and policymakers. The findings are anticipated to influence the development of evidence-based strategies for optimizing the junior high school curriculum, especially in scientific context. This may lead to inclusive learning environments and the promotion of equitable educational outcomes.

METHODS

Research Method

The research method utilized in the study was mixed-method research using questionnaire.

By combining the strengths of quantitative and qualitative methods, mixed methods research aims to provide a more holistic understanding than what can be achieved through standalone quantitative or qualitative studies. This approach is commonly employed in the behavioral, health, and social sciences, particularly in multidisciplinary settings or when dealing with complex situational or societal research. The combination of quantitative data, which involves numerical analysis, and qualitative data, which explores experiences and perceptions, allows researchers to gain a more in-depth view of the topic (George, 2023).

Research Design

The study used a correlational research design. In a correlational research design, the focus is on examining relationships between variables without the researcher intervening or influencing them deliberately. A correlation indicates the degree and direction of the relationship between two or more variables. This direction can either be positive or negative, showing the trend of the association (Bhandari, 2023). For the qualitative part, the respondents provided a response to two open-ended questions after they have finished the quantitative part of the survey.

Participants of the Study

The participants of the study were the 30 respondents taken from Grade 9 learners in one of the single-gender schools (school for boys) and one of the private schools for co-education, who are actively enrolled in their respective schools for school year 2024-2025.

Sampling Design

Purposive sampling design was used in the study. This type of sampling relies on the judgment of the researcher in identifying the individuals who can provide the most suitable information to reach the

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study's objectives and best answer the research questions. The respondents will be selected on purpose in this type of sampling, ensuring a high-quality sample (Nikolopoulou, 2023).

Research Instrument

The research instrument utilized in the study was a researcher-made questionnaire.

The questionnaire was employed to measure the participant's level of social interaction skills and science achievement.

The questionnaire contained the checklist of first quarter science grades, followed by a rating-scale checklist on the level of social interaction skills, and lastly, two open-ended questions centering on the students' perceptions on how their school type impacts their level of social skills and science achievement.

Validity of the Research Instrument

The survey questionnaire, designed to record the personal data of the respondents, measured their level of science achievement and social interaction skills, and obtained their insights on how their school type impact these variables, underwent validity testing by a group of at least three educational experts who specialize in the variables to be measured in the study. The researcher used the Eight-Point Criteria for Content Validation by Good and Scates.

Before reviewing the research instrument, the group of experts was briefed on its context, purpose, and target participants. When the panel of experts answered positively the questions in the criteria, then the questionnaire was considered valid. Moreover, the corrections, comments, and suggestions for the improvement of the items of the questionnaire were considered before the final draft was submitted for reliability testing.

Data Gathering Procedures

Before the study was conducted, the researcher had asked permission from the research adviser and the school heads in one of the all-boys schools and in one of the private schools, where the study was conducted. This was done to inform the school administrators as well as the students about the entire process of the research. After determining the participants, the consent letters for the parents and participants were given to inform them about the study and its purpose, assuring them that personal questions would not be asked except for the questions related to the study. The parents and respondents were also be informed that data collected, and results are confidential; the researcher personally collected the data.

As the study employed a mixed-methods approach, utilizing both quantitative and qualitative data collection methods, two types of data gathering procedures were used. Firstly, quantitative data were gathered through survey administration using Parts 1-3 of the survey questionnaire provided in the appendices of the study. The respondents were instructed to write their responses to the questions on a printed paper format, providing structured and quantifiable data for analysis.

For the qualitative aspect, responses to the two open-ended questions comprising Part 4 of the research instrument were collected, focusing on the personal experiences and perceptions of the participants. Subsequently, the recorded data underwent thematic analysis by the researcher. This qualitative analysis aimed to uncover the patterns and insights related to the research problems outlined, offering a more in-depth understanding of the respondents' experiences and perspectives regarding the level of their social interaction and science achievement. The combination of both quantitative and qualitative data provided a comprehensive and multifaceted exploration of the research problem.

Data Analyses

The information gathered from respondents' responses to the survey questionnaire underwent statistical analysis, using the computer with the Statistical Package for Social Sciences (SPSS), focusing on

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non-parametric tests, namely, mean, Mann-Whitney U test, Spearman rank-order correlation, and thematic analysis. These statistical tests aimed to assess the differences between variables without relying solely on descriptive statistics. These non-parametric tests are statistical analysis method that do not necessitate meeting distribution assumptions to be analyzed.

RESULTS AND DISCUSSIONS

The study aimed to identify the relationship of learners' social interaction and science achievement and its implications on junior high science curriculum during the school year 2024–2025.

The study utilized a mixed-methods approach to gather both quantitative and qualitative data, ensuring a comprehensive understanding of the topic.

The respondents of the study were the 30 respondents who are Grade 9 learners – 15 learners from single-gender and 15 learners from coeducation. Purposive sampling was used in the selection of the respondents according to the inclusion criteria.

For the data collection, a researcher-made research instrument was utilized. The research instrument underwent validity and reliability testing by the relevant experts.

The statistical tools used in the study were mean, Mann-Whitney U-test, and Spearman rank-order correlation with a level of significance set at 0.05. All statistical computation were computer-processed using the Statistical Package for the Social Science (SPSS) software.

The findings of the study are as follows:

Based on the quantitative results, it was found that both school types provide a comparable environment for social interaction with only minor differences. The learners' social interaction varies between single-gender and coeducational settings; coeducational learners experienced more varied interactions, while single-gender school had stronger intra-gender relationships. In addition, the learners in single-gender school performed better in science compared to those in coeducational schools. However, the learners' science achievement differed by school type, with single-gender students excelling, possibly due to reduced stereotypes and more supportive environments. The result also suggested there is no significant relationship between the learners' academic achievement and their social interaction levels.

Based on the qualitative result, it was found out that both opposite-gender and same-gender interactions offered complementary benefits, supporting students' academic and social development in science. This underscored the need for curriculum designs that incorporate both interaction types to optimize learning environments, fostering diverse perspectives and peer support in science education.

CONCLUSION

Based on the findings, the following conclusions were drawn:

School type influences social interaction but does not considerably affect the overall level of peer engagement among learners. The school type significantly affects social interaction; Single-gender schools promote stronger same-gender relationships, while coeducational school has more complex gender-based social dynamics.

Single-gender schools provide an academic advantage in science, possibly due to gender-specific learning strategies, whereas coeducational schools may not meet these learning needs as effectively. The difference in science achievement highlights the advantages of single-gender schooling especially for STEM subjects.

Coeducational schools can achieve similar outcomes if gender biases are minimized. Social interaction does not have a significant impact on the learners' academic achievement.

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