

Influence of the Peer Group on the Academic Achievement of Tertiary Institution Students in Elementary Mathematics: An Analysis of Socio-Psychological Factors

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ABSTRACT

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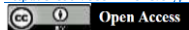
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This study evaluates the influence of peer groups on the achievement of tertiary institution students in elementary mathematics from a socio-psychological perspective. Although mathematics is a fundamental discipline that develops an individual's cognitive and scientific thinking abilities, students' academic outcomes are frequently subject to fluctuations under the pressure of their social environment, specifically their circle of friends. The study was conducted utilizing a descriptive survey design. It encompassed 400 students selected through simple and proportionate stratified random sampling from two tertiary institutions located in Ogun State: Tai Solarin University of Education (TASUED) and Olabisi Onabanjo University (OOU). A specifically designed questionnaire and a mathematics achievement test with a proven reliability coefficient of 0.87 were utilized for data collection. When the acquired results were analyzed using the Chi-square statistical tool, it was proven that the peer group exerts a significant influence on academic achievement in elementary mathematics ($p=0.05$). Furthermore, significant statistical differences were identified between male and female peer influence, as well as between the achievements of students under positive versus negative peer influence. The author concludes that social adjustment and intragroup values play a decisive role in improving students' performance indicators. Consequently, it is recommended that parents and educational professionals adopt a strategic approach to cultivating healthy social competition and a positive peer environment among students.

Keywords: peer influence, academic achievement, tertiary education, elementary mathematics, social adjustment, gender differences

Introduction

Elementary mathematics involves human endeavors and serves as an abstract representational system that helps to develop the scientific, logical, and abstract thinking abilities of an individual. The teaching of mathematics in tertiary institutions aims not only to build professional competence but also to expand a student's analytical potential. However, in recent years, across many higher education institutions, particularly among non-science faculty students, significant shortcomings have been observed in achieving the fundamental objectives set for learning mathematics. As a researcher, I must note that the roots of this decline are not solely connected to a poor foundation from secondary school or teaching methodologies, but are directly related to the student's social ecosystem, specifically the continuous psychological influence of the peer group. An analysis of the literature indicates that a peer group is an informal institution of individuals who are equal in some ways and share similar characteristics, such as age, social status, and interests. This group becomes a dominant force in shaping the student's beliefs, behaviors, and, most importantly, their attitude toward education and academic achievement. During adolescence and youth, students distance themselves from parental supervision to a certain extent, beginning to search for their social identity precisely within their circle of friends, seeking freedom from home to be loyal to the group. In this process, the need for "group acceptance" and "approval" can override academic responsibilities. Studies confirm that the peer group establishes

its own standards, values, and norms for the group. If intellectual labor is not valued within the group culture, or if a disregard for the subject is encouraged, the student is forced to artificially lower their performance, skip classes, or become a victim of conformity. The indirect negative influence is so covert that the student, without any overt coercion, succumbs to "mass backwardness" simply to avoid standing out from the group, feeling an unspoken pressure because they might feel it is not "cool" if they do not do what others are doing. On the other hand, positive peer pressure has an entirely opposite, constructive character. In a positive environment, students are encouraged to engage in collaborative research, form reading groups, use libraries effectively, and actively participate in classroom discussions. Such groups offer a considerable degree of emotional security to their members, helping in the intellectual development of the students and providing them with the courage to express themselves. Group dynamics are also invaluable in gender socialization processes, where the approaches of males and females toward exact sciences are shaped differently depending on the amount of pressure. Unfortunately, to date, the scope of this socio-psychological phenomenon and its decisive importance in academic achievement have not been studied with sufficient empirical evidence in the tertiary education system. The general purpose of this study is precisely to fill this gap, thoroughly investigating the positive and negative influences of the peer group on academic results in elementary mathematics, as well as the variations across gender lines in Ogun State, Nigeria.

Methodology

In order to empirically test the scientific hypotheses formulated for this research, a quantitative approach based on a descriptive survey design was employed. The target population for the study comprised students from all tertiary institutions located in Ogun State, Nigeria. Specifically, Tai Solarin University of Education (TASUED) and Olabisi Onabanjo University (OOU) were selected as the accessible population. To ensure representativeness, a sample size of 400 students (200 from each institution) was randomly selected by the researcher using simple and proportionate stratified random sampling techniques. A strict gender balance was maintained among the participants, comprising both males and females. For data collection, a comprehensive, self-designed questionnaire consisting of three sections (A, B, and C) was utilized. Section A elicited the demographic characteristics of the participating respondents. Section B contained statements structured on a five-point Likert scale model (Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree), aimed at assessing the students' attitudes toward peer pressure and their social adjustment. Section C consisted of 10 standardized multiple-choice questions extracted from the 2014 UTME mathematics examination, serving to objectively measure the students' mathematical academic achievements. The validity of the research instrument was confirmed through constructive suggestions and corrections from experts in the field of measurement and evaluation. To verify the reliability of the achievement test contained in section C, a test-retest technique was applied involving twenty students from TASUED over an interval of fourteen days. The Pearson Product Moment Correlation Coefficient yielded a reliability value of 0.87, guaranteeing a high level of dependability and appropriateness for the instrument. Out of the 410 questionnaires initially administered to account for attrition, 405 were properly filled, and consequently, 400 were ultimately used for data analysis. All acquired numerical data and the formulated hypotheses were analyzed using the Chi-square (χ^2) statistical tool at a 0.05 level of significance to test whether the relationships between expected and actual values were statistically significant.

Results and discussion

The statistical analysis of the data obtained within the framework of the study demonstrated that the influence of the peer group on academic processes in tertiary institutions is not random, but rather

an important sociological phenomenon elevated to a regular pattern. During the testing of the first hypothesis, based on the Chi-square analysis results (X^2 calculated = 465.004 > critical value = 8.666; $df=16$, $p=0.05$), the formulated null hypothesis was decisively rejected, while the alternative hypothesis was accepted. These figures empirically confirm that there is a significant influence of the peer group on the achievement of students in elementary mathematics in tertiary institutions. The results obtained regarding the second hypothesis (X^2 calculated = 331.738 > critical value = 8.383; $df=16$, $p=0.05$) also hold unique scientific significance, demonstrating that social pressure mechanisms operate differently within male and female peer groups. The analysis of the third hypothesis (X^2 calculated = 381.980 > critical value = 7.176; $df=16$, $p=0.05$) clarified that there is a stark and statistically highly significant difference between the achievements of students under positive and negative spheres of influence. These findings buttress the work of Ryan (2012), Ungar (2014), and Ayodele (2016) that shows how important peer pressure is in students' achievements. The main point to be discussed is that group culture often becomes more important to the student than the formal rules of the educational institution. Students seek psychological refuge among their peers; formation of a peer group may occur when frustration sets in as a result of an inability to comprehend what is being taught or conflicts with family members. If the group to which a student belongs considers opposing the rules (e.g., absenteeism or persistent lateness) as a mark of prestige, the student distances themselves from the subject under overt or indirect negative peer pressure. Fearing ridicule or losing their friends, they deliberately lower their intellectual potential. Conversely, in positive groups where a purposeful and academic competitive environment is formed, the positivity empowers the student to excel. The sense of conformity pushes the student to work on themselves, solve complex problems together, and take on specific tasks such as leadership roles. Specifically, analyses within gender contexts showed that peer groups serve as a venue for teaching members gender roles, indicating that each social group defines its own educational standards and cultural expectations for its internal members. Most of the deviant behaviors displayed by students result from wanting to live up to the group's expectations. In conclusion, the process of teaching mathematics is not a purely cognitive act but a socialization process that occurs within strict socio-psychological rules. To improve the quality of education, the social ecosystem of students must first be made healthier.

Conclusion

As a researcher, based on the evidence and statistical analyses obtained, it can be concluded that the role of the peer group is one of the most powerful social factors determining academic success in the tertiary education system. It has been conclusively proven that difficulties and achievements in mastering elementary mathematics are directly and inextricably linked to the values and social norms of the micro-group to which the student belongs. Gender-specific socialization within the group, as well as positive and negative conformity, have the power to entirely change a student's attitude toward education. Therefore, students often practice the behaviors of their peer mates rather than those advocated by their parents, making it imperative for parents to watch out for the types of company their children keep. This issue cannot be resolved solely within the framework of teaching methodology in university classrooms. Parents and educational institution staff must approach the process comprehensively. It is important for parents to be actively involved in their children's lives, to be able to get a sense of how their son or daughter is spending their time, and to keep communication lines open. Educational psychologists and pedagogues, in turn, need to realize that both positive and negative peer influence is inevitable in the school setting. They should focus on creating and promoting classrooms of acceptance and appreciation for diversity. Since peer groups are not a fad but are around to stay, the primary task should be to direct their energy not into negative channels, but toward intellectual development and social responsibility by praising positive choices.

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