

The Relationship Between Peer Groups and the Learning Independence of Biology Education Students

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ABSTRACT

Purpose of the study: This research aims to determine the relationship between peer groups and the learning independence of biology education students.

Methodology: This type of research is quantitative with a correlation method. The population of this study was Biology Education Students, totaling 263 people with a sample size of 132 people. Sampling was carried out using Simple Random Sampling. The data collection techniques used are the learning independence scale and the peer group scale. The data analysis technique is descriptive statistical analysis and inferential statistical analysis with product moment correlation techniques.

Main Findings: The research results based on descriptive statistical analysis show that independence in learning is in the low category with an average value of 88.56 and the peer group is in the medium category with an average value of 87. Meanwhile, the results of inferential statistical analysis show that r_{count} is greater than r_{table} or $0.27 \geq 0.24$, H_0 is rejected and H_1 is accepted, meaning that there is a relationship between the peer group and the learning independence of students. Where is the sig value. 2-tailed is $0.00 \leq 0.05$.

Novelty/Originality of this study: This research contributes to explaining the social aspects of independent learning that are often overlooked in previous literature. While much research has explored internal factors that influence learning independence, the emphasis on the role of peer groups as external agents influencing students' motivation, mindset, and learning styles, is an innovative focus point. This enriches our insight into how social interaction with fellow students can have a significant influence on the level of learning independence of Biology Education students.

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1. INTRODUCTION

Education is all the efforts of adults in association with children to lead their physical and spiritual development towards maturity [1], [2]. From the above formulation it is clear that real education applies in interactions between adults and children. Education is indeed found in the interactions between adults and children [3], [4]. Interaction between adults and adults is not called educational interaction (pedagogical association) because in this association the adult accepts and is responsible for the influences contained in that association.

Learning is a process of effort carried out to obtain a new change in behavior as a whole [5]–[7]. Learning is a cognitive process that is influenced by several factors such as individual circumstances, previous knowledge,

attitudes, individual views, content, and method of presentation. One of the individual factors that influences learning is independence in learning. Independent learning is learning independently, not depending on other people, students are required to have their own activeness and initiative in learning [8], [9]. Independence, like other psychological conditions, can develop well if given the opportunity to develop through continuous practice and carried out from an early age. This training can take the form of giving tasks without assistance. Student independence in learning is one of the important factors that must be considered to achieve good learning outcomes.

Student independence in learning is something that is very important and needs to be developed in students as individuals who are positioned as students. By fostering independence in students, students can do everything according to their abilities. Students who have high learning independence will try to complete the exercises or assignments given by the teacher with their abilities, whereas students who have low learning independence will depend on other people [10]–[12]. If a student experiences stress in their life, their intelligence gradually decreases. Learning independence is influenced by several factors including family environment and peer environment.

A peer group is defined as a group of people of more or less the same age who think and act together [13], [14]. Peer group acceptance is related to social acceptance, which is a child's ability to accept so that the child is respected by other group members as a useful social partner. This ability includes the child's ability to accept other people. Acceptance of a peer group means being chosen as a friend for an activity in a group, where someone is a member [15], [16]. This is an index of success that children use to play a role in social groups and shows the degree to which other group members like working together or playing with them.

Based on initial observations of Biology Education Department students, researchers got a picture of students who experienced problems in independent learning. Those who should dominate learning activities by actively asking questions and input are actually only passive in attending lectures and only act as recipients of learning material. Biology Education Department students are still used to being busy so they no longer hear lecturers when teaching. Things they keep busy with include chatting with friends and playing on their cellphones when the lecturer is explaining. Some students don't use their free time to visit the library when they don't have lectures scheduled, they prefer to hang out with their peers.

The results of observations carried out on Biology Education Department students, furthermore, the researchers obtained an overview of the division of study groups in class, showing that there are still many students who tend to choose group friends for the reason that they do not want to be separated from their peers, because they are already dependent on each other for no reason get to know his new group of friends. When someone has a peer group of friends, it is difficult for them to be independent in doing various things, this happens because they are used to always being with their peer group, either in terms of learning or other activities outside of lectures.

Previous research related to student learning independence has been conducted by Aslamiyah et al., [17] which states that students are proven to have positive learning independence, students are not dependent on others, they tend to be more independent in everything. Therefore, this study will examine whether there is a relationship between peer groups and the learning independence of Biology Education students. Research on the relationship between peer groups and the learning independence of Biology Education students is important because the social environment, especially peers, has a significant role in shaping students' learning behavior and attitudes. Peer groups can be a source of motivation, emotional support, and positive learning behavior models, so that they can influence students' learning independence. On the other hand, less supportive interactions also have the potential to inhibit the development of learning independence. The novelty of this study lies in further exploration of how peer groups play a role in shaping students' learning independence in the field of biology education. Based on the background described above, this study aims to determine the relationship between peer groups and learning independence of biology education students.

2. RESEARCH METHOD

2.1. Types of Research

This type of research is quantitative with a correlation method where this research aims to determine the relationship and level of relationship between two or more variables without any attempt to influence these variables so that there is no variable manipulation [18]–[20]. The hypothesis tested is the relationship between learning independence and peer groups. This research uses a correlational design.

2.2. Population and Research Sample

The population in this study were biology education students at Alauddin State Islamic University, Makassar, consisting of three classes totaling 263 people. In this study, researchers took a sample of 50% of the population of 263 people. So, the total research sample is 131.5 rounded up to 132 samples as respondents and will be taken from three generations of Biology Education Department students, Alauddin State Islamic University, Makassar.

2.3. Data Collection Technique

Data collection techniques in this study used scales and documentation. This scale is used to reveal data on student learning independence with indicators of responsibility, perseverance, initiative, self-control and self-stability. Likewise, peer groups with indicators of first impressions, reputation, self-appearance, social behavior, maturity, personality traits, social status, place of residence. This scale consists of 77 questions for independence, 40 questions, peer groups, 37 questions. Documentation is a way to obtain data by conducting or reviewing written sources. This method is used to collect and obtain data from the Biology Education Department, Faculty of Tarbiyah and Teacher Training, Alauddin State Islamic University, Makassar, which will be used as a basis for conducting research in the form of the number of students and other supporting data.

2.4. Research Instruments

The instruments in this research are the learning independence scale and the peer group scale. The instruments used have been tested for validity and reliability. The instrument has been declared valid. The results of the peer group scale reliability test using the Cronbach's Alpha technique obtained a reliability coefficient of 0.760. and the results of the Learning Independence scale reliability test using the Cronbach's Alpha technique obtained a reliability coefficient of 0.885. This means that the research instrument is reliable. Below is a grid of instruments which can be seen in the following table:

Table 1. Instrument Grid

Variable	Aspect	Number of Questions
Learning independence	Responsibility	40
	Persistent	
	Initiative	
	Self-control	
Peer Group Acceptance	Self-determination	37
	First impression	
	Reputation	
	Personal appearance	
	Social behavior	
	Maturity	
	Personality traits	
	Social status	
	Residence	

The statement scale scores used in this study consist of a scale of 1 to 4 which can be seen in Table 2.

Table 2. Statement Scale Score

Answer	Value
Very Appropriate	4
Appropriate	3
Not Appropriate	2
Very Inappropriate	1

2.5 Data Analysis Techniques

Data obtained from the sample will be used to test the hypothesis. Therefore the data needs to be analyzed. The data analysis techniques used are descriptive analysis techniques and inferential statistical analysis. Inferential statistics were used to test the research hypothesis with Pearson Product Moment Correlation analysis. Previously, normality tests and data linearity tests will be carried out. Data normality test can also use Kolmogrov-Smirnov statistical test with the help of SPSS for windows release Version 16.0. If the significance value > 0.05 then the data in the study is normally distributed. Data linearity test can also use Anova table statistical test with the help of SPSS for windows release Version 16.0. If the significance value > 0.05 then the data meets the linearity requirements.

Inferential analysis is used to test the correlation between the variables used, namely the relationship between peer groups (variable X) and the learning independence of Biology Education Department students (variable Y) using the Product Moment correlation formula.

$$r_{XY} = \frac{N \sum XY - (\sum X)(\sum Y)}{\sqrt{\{N \sum X^2 - (\sum X)^2\} \{N \sum Y^2 - (\sum Y)^2\}}} \dots\dots\dots(1)$$

Information:

- r_{XY} = Correlation coefficient between variables X and Y
- N = Population number/Number of respondents
- $\sum XY$ = The sum of all scores of variable X with variable Y, after first being adjusted for accuracy.
- $\sum X^2$ = The sum of all scores for variable X, after first being squared.
- $\sum Y^2$ = The sum of all scores for variable Y, after first being squared.
- $(\sum X)^2$ = The sum of all scores of variable X, then squared.
- $(\sum Y)^2$ = The sum of all scores of variable Y, then squared.

The following guidelines can be used to interpret the correlation coefficient:

Coefficient Interval	Relationship Level
0.000 – 0.199	Very Low
0.200 – 0.399	Low
0.400 – 0.599	Medium
0.600 – 0.799	Strong
0.800 – 1.000	Very Strong

The magnitude of the correlation produced by the formula above only applies to the sample studied. Whether the correlation coefficient can be generalized or not, its significance must be tested using the following formula:

$$t_{count} = \frac{r \sqrt{n-2}}{\sqrt{1-r^2}} \dots\dots\dots(2)$$

Information:

- t = Correlation coefficient value
- r = Correlation value
- n = Number of Samples

3. RESULTS AND DISCUSSION

3.1. Results

Based on the results of research conducted at tarbiyah and teacher training faculties, especially biology education students, the following data were obtained:

Table 4. Mean and Empirical Standard Deviation of Learning Independence

Statistics	Statistical Score
Sample	66
Lowest score	76
Highest score	108
Average	88.56
Standard deviation	5.11

The empirical mean and standard deviation table shows that the description of learning independence for students in the Department of Biology Education, Faculty of Tarbiyah and Teacher Training, Alauddin State Islamic University, Makassar obtained through the scale instrument shows that the highest score is 108 and the lowest score is 76. The average score obtained is 88.56. The standard deviation is 5.11.

Table 5. Categorization of Learning Independence

Interval	Frequency	Percentage	Information
$X \leq 95$	45	68%	Low
$95 < X \leq 105$	19	29%	Currently
$X \geq 105$	2	3%	Tall
Amount	66	100%	

Based on the table above, it is found that the picture of student learning independence is that 19 students with a percentage of 29% are in the medium category and 2 students with a percentage of 3% are in the high category. Data from the frequency distribution table of learning independence among students in the Department

of Biology Education, Tarbiyah and Teacher Training Faculty, Alauddin State Islamic University, Makassar shows that the tendency for learning independence is centered on the low category. Thus, it can be concluded that the learning independence scores for all subjects in this study are in the low category.

Based on research conducted on students of the Department of Biology Education, Alauddin State Islamic University, Makassar with a sample size of 66 students taken at random. So these data can then be processed using descriptive statistics.

Table 6. Mean and Standard Deviation of Empirical Peer Group

Statistics	Statistical Score
Sample	66
Lowest score	56
Highest score	119
Average	87
Standard deviation	4

The empirical mean and standard deviation table shows that the description of the peer group of students from the Department of Biology Education, Faculty of Tarbiyah and Teacher Training, Alauddin State Islamic University, Makassar obtained through the scale instrument shows that the highest score is 119 and the lowest score is 56. The average score obtained is 87. The standard deviation is 4.

Table 7. Peer Group Categorization

Interval	Frequency	Percentage	Information
$X \leq 82$	20	30%	Low
$82 < X \leq 101$	32	49%	Currently
$X \geq 101$	14	21%	Tall
Amount	66	100%	

Based on the table above, it is found that the description of the student peer group is that there are 32 students with a percentage of 49% in the medium category and 14 students with a percentage of 21% in the high category. Data from the frequency distribution table of learning independence among students in the Department of Biology Education, Faculty of Tarbiyah and Teacher Training, Alauddin State Islamic University, Makassar shows that the peer group tendency is centered in the medium category, thus it can be concluded that the peer group scores for all subjects of this research are in the medium category.

After conducting research and managing the data, researchers carry out a normality test to find out whether the data is normally distributed or not normally distributed so that researchers can use parametric or non-parametric statistical methods. From the results of data processing using SPSS 16.0. Researchers obtained normally distributed distribution data, namely:

Table 8. Normality Test Results

Variable	Significant	Information
Learning independence	$0,242 > 0,050$	Normal
Peer group acceptance	$0,185 > 0,050$	Normal

The linear test in this research was carried out using analysis of variance. The rule used is if $\text{sig} < \alpha$ (0.05), and $F_{\text{count}} < F_{\text{table}}$, then the relationship between the two variables is linear [21], [22]. The conclusion of the linearity test results can be seen in the table below:

Table 9. Linearity Test Results

Correlation	F	Sig.	Information
XY	1,833	0,000	Linear

Based on the table above, the results of the linearity test obtained a sig value. $0.000 < \alpha$ (0.05) and F_{count} value $1.833 < F_{\text{table}} 2.78$ which means the data is linear.

$$r_{XY} = \frac{N \sum XY - (\sum X)(\sum Y)}{\sqrt{\{N \sum X^2 - (\sum X)^2\} \{N \sum Y^2 - (\sum Y)^2\}}}$$

$$r_{XY} = \frac{66 (464805) - (6128)(5728)}{\sqrt{\{66 (532825) - (6128)^2\} \{66 (394641) - (5728)^2\}}}$$

$$r_{XY} = \frac{306771 - 351011}{\sqrt{\{351664 - 375523\}\{260463 - 328099\}}}$$

$$r_{XY} = \frac{44240}{\sqrt{(23859)(67636)}}$$

$$r_{XY} = \frac{44240}{161372}$$

$$r_{XY} = 0.27$$

From the results of the product moment correlation calculation, it was obtained that r_{xy} was 0.27. From this figure, there was a significant relationship between learning independence and the peer group of students in the Department of Biology Education, Alauddin State Islamic University, Makassar.

Based on the calculation above, $\alpha = 0.05$ and $n = 66$. $Dk = n - 2 = 66 - 2 = 64$ so that $r_{table} = 0.24$ is obtained, it turns out that r_{xy} is greater than r_{table} $0.27 > 0.24$. Calculating significance with the t_{count} formula.

$$t_{count} = \frac{r \sqrt{n-2}}{\sqrt{1-r^2}}$$

$$t_{count} = \frac{0.603 \sqrt{66-2}}{\sqrt{1-0.603^2}}$$

$$t_{count} = \frac{0.603 \sqrt{64}}{\sqrt{1-0.36}}$$

$$t_{count} = \frac{0.603 \times 8}{0.64}$$

$$t_{count} = \frac{4.824}{0.64}$$

$$t_{count} = 7.53$$

The t_{count} result was greater than t_{table} or $7.53 \geq 1.67$, H_0 was rejected and H_1 was accepted, meaning that there was a relationship between learning independence and the peer group of students in the Department of Biology Education, Faculty of Tarbiyah and Teacher Training, Alauddin State Islamic University, Makassar.

3.2. Discussion

Based on the results of the analysis using SPSS 16.0, it is known that the learning independence score category for students in the Department of Biology Education, Faculty of Tarbiyah and Teacher Training, Alauddin State Islamic University, Makassar is more in the low category. It can be seen that 45 respondents (68%) had scores in the low learning independence category, 19 respondents (29%) had scores in the medium learning independence category, 2 respondents (3%) had scores in the high learning independence category. These results show that the majority of biology education students have low learning independence.

The results of the average comparison show that the empirical average ($x = 88.56$) is higher than the hypothetical average ($\mu = 100$). This shows that the picture of independence in learning biology education is high. The results of the standard deviation comparison show that the empirical standard deviation ($s = 5.11$) is higher than the hypothetical standard deviation ($\sigma = 5.3$). Based on observations, researchers get a picture of students who experience problems in learning independence. Those who should dominate learning activities by actively asking questions and input are actually only passive in attending lectures and purely only act as recipients of learning materials.

Based on the results of the analysis using SPSS 16.0, it is known that the peer group score category for students from the Department of Biology Education, Faculty of Tarbiyah and Teacher Training, Alauddin State Islamic University, Makassar is more in the medium category. It can be seen that 20 respondents (30%) have a score in the low peer group category, 32 respondents (49%) have a score in the medium peer group category, 14 respondents (21%) have a score in the high peer group category. These results show that the majority of Biology Education Department students have a moderate peer group.

The results of the average comparison show that the empirical average ($x = 87$) is lower than the hypothetical average ($\mu = 92$). This shows that the picture of the biology education peer group is low. The results

of the standard deviation comparison show that the empirical standard deviation ($s = 4$) is higher than the hypothetical standard deviation ($\sigma = 10$). The results of the researcher's observations provide a picture of the division of study groups in the class, showing that there are still many students who tend to choose group friends because they do not want to be separated from their peers.

Based on the peer group data analysis, it was obtained that the r_{count} was greater than r_{table} or $0.27 \geq 0.24$, H_0 was rejected and H_1 was accepted, meaning that there was a relationship between learning independence and the peer group of students in the Department of Biology Education, Faculty of Tarbiyah and Teacher Training, Alauddin State Islamic University, Makassar. Where is the sig value. 2-tailed is $0.00 \leq 0.05$. These findings support the theory which states that highly independent students based on survey results are those who show initiative, independence and perseverance in learning, accept responsibility for learning, treat problems as challenges rather than obstacles, are able to self-discipline and have a high level of curiosity. The results of this research are supported by research conducted by Maghfiraini which shows that there is a significant relationship between peer group interactions and student learning independence. Peer groups know more about the conditions or circumstances of their friends than their parents, it is through friendship that a teenager will feel that he or she is found or needed through other people's responses. When interacting with a peer group, a teenager always feels more confident if he does something together with his friends than if he does it alone.

The peer environment also has a big influence on learning independence because when someone already has a peer group of friends, it will be difficult for them to be independent in doing various things, for example when completing college assignments. In this case, not all peers can have a good influence. Within peers, there are friends who can help motivate them in learning, and there are also those who bring in things that are not good. This is supported by Slameto's theory which states that social friends have a very big influence and enter the child's soul more quickly. So that students can learn, good friends will have a good influence on students, and vice versa. External factors influence independence by providing standards for evaluating behavior.

The relationship between peer groups and student learning independence is an interesting aspect to research in the context of higher education. Interaction with peer groups, or peer groups, can play an important role in forming learning independence. In a campus environment, peer groups can be agents that influence students' thinking patterns, motivation and learning styles. Differences in learning methods, discussions about material, or social support provided by peer groups can shape students' attitudes and confidence to manage their own learning [23]–[25]. The level of student learning independence often reflects the extent to which they are able to manage their time, complete academic tasks, and manage their learning without complete dependence on help from other parties. In this context, interaction with peer groups can help students develop effective learning strategies. Group discussions, information sharing, and mutual guidance that occur among peer group members can increase learning independence by providing resources and new perspectives on how to overcome learning challenges.

However, it should be noted that not all interactions with peer groups will always have a positive impact on learning independence. Too much social interaction without a focus on learning, or being too influenced by group decisions without your own critical thinking, can hinder learning independence. This shows that the quality of interaction and context of the peer group is also an important factor in how it influences student learning independence. Apart from that, learning independence is also closely related to students' intrinsic motivation [26]–[28]. Interaction with a positive peer group, such as support and encouragement for learning, can increase intrinsic motivation which in turn strengthens learning independence. However, less productive or less supportive interactions from peer groups can reduce motivation and, ultimately, can negatively affect student learning independence.

From a personal development perspective, interactions with peer groups can also provide valuable social and cultural experiences for students [29]–[31]. Having good relationships with peer groups not only supports overall personal development but also plays a role in shaping students' academic and social identities. This shows that interaction with peer groups is not only relevant in the context of independent learning but also in students' holistic experience during college. Further research that includes longitudinal studies or more detailed analysis of the most influential types of peer group interactions could provide deeper insight into how these relationships influence students' learning independence. With a deeper understanding, educational institutions can develop more targeted and effective strategies in facilitating student learning independence in the future.

The implications of this study indicate that peer groups have an important influence on the development of learning independence in Biology Education students. The results of this study can be a reference for educators and educational institutions to pay more attention to social dynamics in the learning environment, especially how interactions between peers can be utilized to support learning independence. Educators can develop learning strategies that facilitate healthy group work and collaboration, so that students not only learn from instructors but also from their peers. In addition, educational institutions can integrate social development programs to increase support between students, which can ultimately strengthen their learning independence. These findings can also encourage further research on educational interventions that focus on increasing the role of peers in the learning process.

4. CONCLUSION

Based on the results of the research and data analysis, it can be concluded that as many as 45 people (68%) of students are categorized as having low learning independence, as many as 32 students (49%) are categorized as having moderate peer groups, and there is a relationship between learning independence and peer groups of students in the Biology Education Department, Faculty of Tarbiyah and Teacher Training, Alauddin State Islamic University, Makassar. Based on the research results, it is recommended that educators optimize peer interactions through collaborative activities that can strengthen students' learning independence. In addition, educational institutions are advised to develop mentoring programs or study groups designed to encourage positive social support among students.

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