

Learning Motivation Levels among Biology Education Undergraduates in a Laboratory Techniques Course

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ABSTRAK

Penelitian ini bertujuan untuk mengetahui tingkat motivasi belajar mahasiswa pada mata kuliah Teknik Laboratorium di Jurusan Pendidikan Biologi angkatan 2021 - 2023, mengingat mata kuliah ini menuntut kesiapan mental, ketelitian, dan keterampilan praktikum yang tinggi. Penelitian ini menggunakan pendekatan kuantitatif dengan metode deskriptif. Populasi penelitian terdiri atas seluruh mahasiswa aktif Jurusan Pendidikan Biologi angkatan 2021 - 2023 yang berjumlah 93 orang, dengan pengambilan sampel menggunakan teknik non-probability sampling. Pengumpulan data dilakukan menggunakan kuesioner motivasi belajar berskala Likert yang telah divalidasi melalui penilaian ahli. Data dianalisis menggunakan teknik analisis deskriptif untuk menggambarkan tingkat motivasi belajar mahasiswa. Hasil penelitian menunjukkan bahwa motivasi belajar mahasiswa pada mata kuliah Teknik Laboratorium berada pada kategori sedang, dengan persentase sebesar 63% dan skor rata-rata 4,285. Temuan ini menunjukkan bahwa motivasi belajar mahasiswa cukup baik, namun masih memerlukan penguatan. Implikasi penelitian ini diharapkan dapat menjadi bahan pertimbangan bagi dosen dalam merancang strategi pembelajaran yang lebih efektif untuk meningkatkan motivasi belajar mahasiswa.

ABSTRACT

This study aims to determine the level of student learning motivation in the Laboratory Engineering course in the Biology Education Department, 2021-2023 intake. This study uses a quantitative approach with descriptive methods. The study population consisted of all 121 active students in the Biology Education Department, 2021-2023 intake. Data collection was conducted using a learning motivation questionnaire specifically designed for the Laboratory Engineering course. The data obtained were then analyzed using descriptive analysis techniques to describe the overall level of learning motivation. The results show that student learning motivation in the Laboratory Engineering course is in the moderate category, with a percentage of 63% and an average score of 4.285. This finding indicates that most students have sufficient learning motivation, but still need reinforcement to optimally improve their learning motivation. The implications of this study are expected to encourage students to balance learning motivation with effective learning strategies, good time management, and discipline in participating in the learning process in lectures.

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Introduction

Education is a fundamental means of preparing individuals to navigate the complexities of life by equipping them with essential knowledge and skills. Both formal and non-formal education are intentionally designed to establish conducive learning environments that enable learners to develop their potential optimally across multiple dimensions, including spirituality, self-regulation, personality, intellectual capacity, moral character, and practical skills (Zulfa & Pramono, 2017). The effectiveness of this educational process is commonly reflected in students' learning outcomes, which are influenced by a range of internal and external factors. Among these factors, learning motivation plays a particularly important role in determining students' engagement and academic achievement.

Learning motivation refers to the psychological drive within students that promotes active engagement in the learning process and determines the persistence and direction of their learning activities. Previous studies have demonstrated that learning motivation plays a significant role in academic achievement, as it encourages learners to participate actively, sustain their efforts, and take responsibility for their learning (Lutfiah, 2020; Kasari & Sawitri, 2020). Low academic achievement is therefore not always attributable to limited cognitive ability; rather, it may also result from insufficient intrinsic motivation among students (Emda, 2018).

At the higher education level, students' learning motivation plays a crucial role in determining the quality of the learning process, particularly in courses that require active engagement and practical skills. Highly motivated students tend to demonstrate greater enthusiasm, active participation, and a stronger ability to comprehend and apply course content, whereas students with lower levels of motivation are more likely to remain passive during learning activities (Ainurrohmah & Handayani, 2020). Appropriate learning motivation also contributes to creating a more conducive learning environment, fostering effective communication between lecturers and students, and enhancing students' creativity and self-confidence (Sobandi, 2017).

The Laboratory Techniques course in the Biology Education Department is characterized by learning activities that require a high level of student motivation, given the demands for practical laboratory skills, precision, and psychological readiness.

Preliminary findings from interviews with students enrolled in the Biology Education Department, Faculty of Education and Teacher Training, Universitas Islam Negeri (UIN) Alauddin Makassar, from the 2021–2023 cohorts revealed variations in students' learning motivation and its association with their academic achievement in the Laboratory Techniques course. The interviews were conducted on August 15, 2023, involving representatives from each cohort. All participants were asked the same set of questions concerning the sources of their learning motivation and the perceived relationship between their motivation and the learning outcomes they achieved.

The interview findings revealed variations in learning motivation across student cohorts. Students from the 2021 cohort reported that their learning motivation was primarily driven by parental support, which contributed positively to satisfactory academic achievement in the Laboratory Techniques course. Students from the 2022 cohort indicated that their motivation was influenced by both parental support and peers; however, internal factors led to a decline in motivation, which was subsequently associated with lower academic performance in the course. Meanwhile, students from the 2023 cohort reported that their learning motivation tended to fluctuate, although their academic performance in the Laboratory Techniques course remained relatively good.

The variation in students' learning motivation indicates that motivation plays an important role in supporting their academic achievement in the Laboratory Techniques course. Therefore, a more systematic investigation is needed to determine students' levels of learning motivation as a basis for understanding the current learning conditions and for formulating appropriate strategies to enhance the quality of competency attainment in the course.

Motivation refers to an internal drive that stimulates individuals to take action toward achieving specific goals, as reflected in changes in energy, the emergence of affective responses, and goal-directed reactions (Muhammad, 2016). In the context of learning, academic motivation plays a crucial role in determining the extent of students' engagement and the persistence of their learning efforts. Students with high levels of learning motivation tend to demonstrate sustained and consistent engagement throughout the learning process, whereas low learning motivation may hinder optimal academic achievement.

This study aims to determine the level of students' learning motivation in the Laboratory Techniques course. Theoretically, the study is expected to deepen understanding of the relationship between learning motivation and academic achievement. Practically, the findings may help first-year students better understand the role of motivation in shaping their learning outcomes. In addition, the results are expected to provide an empirical basis for future research and to enrich the scientific literature concerning the relationship between learning motivation and academic achievement among students in the Biology Education Study Program.

Methodology

This study employed a descriptive quantitative approach to examine the level of students' learning motivation in the Laboratory Techniques course offered by the Biology Education Study Program, Faculty of Tarbiyah and Teacher Training, Universitas Islam Negeri Alauddin Makassar. The descriptive quantitative approach was used to provide an objective representation of students' learning motivation based on numerical data, without introducing any treatment or manipulation of the research variables (Budiarti & Muhammad, 2013).

This study was conducted at Universitas Islam Negeri (UIN) Alauddin Makassar, located at Jl. H.M. Yasin Limpo No. 36, Romangpolong, Somba Opu District, Gowa Regency, South Sulawesi, Indonesia, specifically within the Biology Education Study Program, Faculty of Tarbiyah and Teacher Training.

The population of this study comprised all students enrolled in the Biology Education Study Program from the 2021–2023 cohorts at the Faculty of Education and Teacher Training, Universitas Islam Negeri (UIN) Alauddin Makassar, totaling 121 students.

The study sample consisted of 93 university students selected through a non-probability sampling approach using quota sampling. Participants were selected non-randomly by considering the cohort-based strata within the study population. The sample comprised 31 students from the 2021 cohort, 25 from the 2022 cohort, and 37 from the 2023 cohort, thereby ensuring that each cohort was represented in accordance with the proportional distribution and characteristics of the study population.

Data were collected using a Google Forms-based questionnaire consisting of 15 items rated on a four-point Likert scale: Strongly Agree, Agree, Disagree, and Strongly Disagree, as presented in the table below.

Table 1
Questionnaire Scoring Criteria

Response Option	Statement	
	Positive	Negative
Strongly Agree	4	1
Agree	3	2
Disagree	2	3
Strongly Disagree	1	4

The learning motivation questionnaire was developed based on a review of relevant theoretical perspectives on learning motivation and was adapted to the specific characteristics of the Laboratory Techniques course. The indicators of learning motivation employed in this study are presented in the table below.

Table 2
Blueprint of the Learning Motivation Instrument

No	Aspect	Indicator	Item Number		Number of Items
			positive	Negative	
1.	Intrinsic Motivation	- Desire and determination to achieve success	1,2	3	3
		- Drive and need for learning	4, 5	6	3
		- Expectations and aspirations for the future	7, 8	9	3
	Extrinsic Motivation	- Engaging learning activities	10	11	2

- A conducive learning environment	12, 13	14, 15	4
Total	15		

The questionnaire was distributed proportionally among students from the 2021–2023 cohorts based on the predetermined sample size for each cohort, thereby ensuring adequate representation of respondents across all cohorts.

In addition, document analysis was employed to obtain supporting data on student enrollment and academic achievement in the Laboratory Techniques course among Biology Education students from the 2021–2023 cohorts. These documentary data served as supplementary evidence to strengthen the analysis of students' learning motivation and to provide contextual information regarding their academic achievement.

The questionnaire instrument was validated through expert judgment involving two validators, Ummul Hasanah, S.Pd., M.Pd., and Zulkarnaim, S.Si., M.Kes., to establish the content validity of the instrument (Zahrani, 2018). The criteria used to interpret the validity results are presented in Table 3.

Table 2

Interpretation of Validity Scores

Validity Score Range	Interpretation Criteria
3.26 - 4.00	Highly Valid
2.51 - 3.25	Moderately Valid
1.76 - 2.50	Less Valid
1.00 - 1.75	Invalid

Data were analyzed descriptively to provide a comprehensive overview of students' learning motivation without making inferences or generalizations beyond the observed data (Pebriani, 2018). Questionnaire responses were analyzed to determine students' levels of learning motivation based on their total response scores. The motivation scores were subsequently classified into high, moderate, and low categories using the mean and standard deviation (SD) as the basis for score interpretation. This classification provided a systematic and objective description of students' learning motivation in the Laboratory Techniques course.

Results and Discussion

Based on the results of the data analysis, most students in the Biology Education Department from the 2021–2023 cohorts were classified as having a moderate level of learning motivation (63%), followed by those in the low (19%) and high (17%) categories. These findings indicate that the majority of students demonstrate an adequate level of learning motivation; however, their motivation has not yet reached an optimal level in engaging with the Laboratory Techniques course. This condition suggests that there remains considerable scope for

strengthening students' learning motivation to support more effective attainment of practical laboratory competencies. To facilitate the interpretation of the findings, the distribution of students' learning motivation scores is presented in the form of a histogram, allowing the overall distribution and tendency of motivation levels to be visually examined, as illustrated in Figure 1.

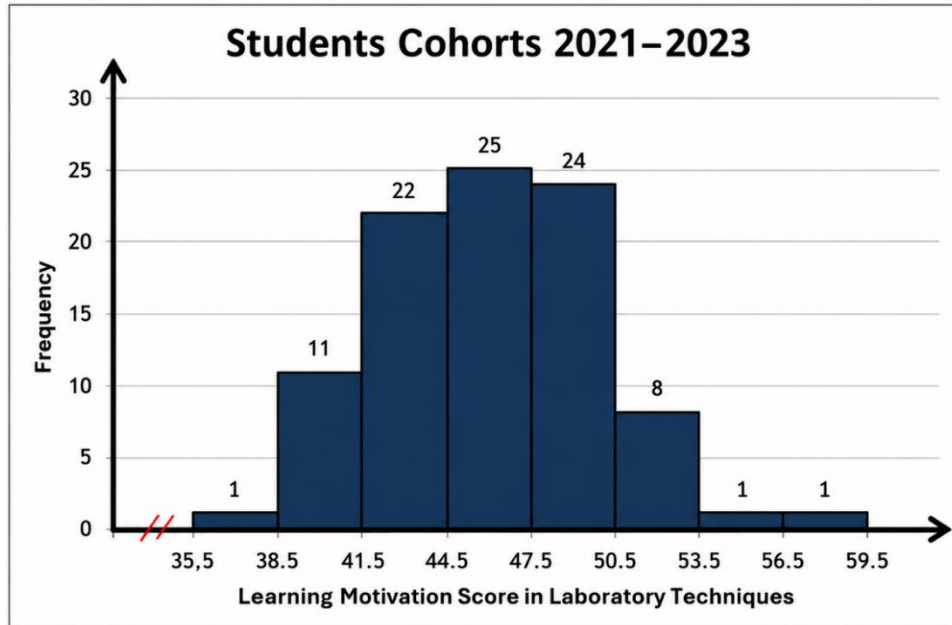


Figure 1. Frequency Distribution Histogram of Learning Motivation among the 2021–2023 Cohorts

Descriptive analysis of the questionnaire data indicated that students' learning motivation scores ranged from 36 to 59, with a mean score of 46.07 and a standard deviation of 3.90, as presented in Figure 1.

Furthermore, students' learning motivation scores were classified into three levels—high, moderate, and low—using the mean and standard deviation (SD) as the basis for categorization. The high category was assigned to scores exceeding one standard deviation above the mean ($X > \text{Mean} + 1 \text{ SD}$), whereas the moderate category included scores falling between one standard deviation below and one standard deviation above the mean ($\text{Mean} - 1 \text{ SD} < X < \text{Mean} + 1 \text{ SD}$). Scores below one standard deviation from the mean ($X < \text{Mean} - 1 \text{ SD}$) were classified as low. These classification criteria were adopted from the categorization procedure employed in a previous study (Nurcahya, 2021).

Table 3

Categorization of Learning Motivation among the 2021–2023 Cohorts

Criterion	Interval	Category	F	Percentage (%)
$X > \text{Mean} + 1 \text{ SD}$	$X > 50$	High	16	17%
$\text{Mean} - 1 \text{ SD} < X < \text{Mean} + 1 \text{ SD}$	$43 < X < 49$	Moderate	59	63%
$X < \text{Mean} - 1 \text{ SD}$	$X < 42$	Low	18	19%
Total			93	100%

Based on the data intervals presented in Table 4, the majority of students (63%) were classified as having a moderate level of motivation, while 19% exhibited low motivation and 17% demonstrated high motivation. These findings indicate that most students possess a reasonably adequate level of learning motivation. Nevertheless, a smaller proportion of students may require additional support and encouragement to strengthen their engagement and maintain consistent participation throughout the learning process in the Laboratory Techniques course.

Students in the moderate motivation category (63%) demonstrated a reasonably good ability to participate in lectures; however, they were not yet fully consistent in maintaining learning focus and completing assigned tasks. This condition suggests that students possessed an adequate level of motivation to engage in learning activities, although their learning behavior remained susceptible to influences from factors outside the instructional process. These findings reinforce the conceptualization of learning motivation as a combination of internal and external drives that shape individuals' learning behaviors (Uno, 2011). Furthermore, the results reflect a pattern commonly reported in studies of university students' learning motivation, particularly in courses that require a balance between conceptual understanding and practical skills.

Students with low levels of learning motivation, accounting for 19% of the total sample, tended to demonstrate limited engagement in the Laboratory Techniques course. This condition was reflected in behaviors such as postponing or neglecting the completion of assignments, paying insufficient attention to course content, and inconsistently fulfilling academic responsibilities both inside and outside the classroom. These findings suggest that low learning motivation may reduce students' concentration and hinder the achievement of intended learning outcomes. Therefore, instructional strategies that effectively enhance students' learning motivation are needed to strengthen their academic engagement and improve learning outcomes in the Laboratory Techniques course.

Students with a high level of learning motivation, representing 17% of the sample, consistently demonstrated strong concentration on learning materials and were not easily distracted during the learning process. They tended to prioritize academic assignments and made sustained efforts to complete them within the designated deadlines. This relatively high level of motivation indicates that these students exhibited greater discipline and consistency in their learning activities. This finding is consistent with Muhammedi et al. (2017), who emphasized that

motivation serves as a primary driving force underlying learning activities and directing learners toward the achievement of expected educational goals.

Students categorized as having high learning motivation generally demonstrate strong enthusiasm for learning, a willingness to engage deeply with the subject matter, and an awareness of the importance of academic achievement. This finding is consistent with Need for Achievement theory as discussed by Pang and Schultheiss (2005), which posits that individuals with a strong achievement motive tend to pursue clearly defined goals, embrace challenging tasks, and demonstrate a high degree of self-direction throughout the learning process.

Nevertheless, although the score was relatively high, it had not yet reached the “very high” category, suggesting that some students were not fully engaged in the learning process. This suboptimal level of learning motivation may be associated with several factors, including limited laboratory facilities, insufficient variation in instructional methods, and a relatively monotonous learning environment. Previous research has similarly demonstrated that a supportive learning environment contributes significantly to enhancing university students’ learning motivation (Kurniawati, 2020).

The findings of this study highlight the need for further efforts to enhance students’ learning motivation, particularly in the Laboratory Techniques course. In instructional contexts, contextualized and student-centered approaches have been theoretically and empirically recognized as effective in promoting students’ motivation and engagement in learning. Previous research has also demonstrated that the implementation of active and practice-oriented learning methods in laboratory settings can foster students’ interest and encourage greater participation in the learning process (Sari, Hafiza, & Aulia, 2024). Therefore, the present findings may serve as an empirical basis for the development and implementation of innovative instructional strategies aimed at strengthening students’ learning motivation.

Overall, the findings of this study indicate that the learning motivation of students in the Biology Education Department falls within the moderate category. This suggests that the students possess an adequate foundation of learning motivation; however, substantial room for improvement remains to achieve a more optimal level of motivation.

These findings indicate that most students demonstrate a moderate level of learning readiness for participating in laboratory-based practical activities. However, this level of readiness has not yet reached an optimal condition. Therefore, further efforts are needed to enhance the learning environment and implement more adaptive pedagogical approaches to strengthen students’ learning motivation and improve the overall quality of the learning experience.

Conclusion

The findings revealed that students from the 2021–2023 cohorts of the Biology Education Department demonstrated a mean learning motivation score of 46.07 in the Laboratory Techniques course. Based on the established classification criteria, 63% of the students were categorized as having a moderate level of learning motivation, 17% as having high motivation, and 19% as having low motivation.

The predominance of students in the moderate-motivation category indicates that most students possessed an adequate level of motivation to engage in learning activities, although this level had not yet reached its optimal potential. This finding suggests that further improvement is needed, particularly among students with moderate and low levels of motivation, to strengthen their engagement, persistence, and consistency in the learning process.

Students' learning motivation may be influenced by various factors, including perceived competence, self-confidence, interest, and intellectual ability. Students who perceive themselves as competent and demonstrate a strong interest in the subject matter are generally more likely to actively seek relevant information, comprehend instructional guidance, and complete academic tasks effectively. In contrast, students with moderate or low levels of motivation may require additional academic support and appropriate instructional interventions to enhance their engagement and participation in learning activities.

Accordingly, fostering a supportive learning environment, implementing active learning strategies, and adopting adaptive pedagogical approaches are essential for strengthening students' learning motivation. Such efforts are particularly important in practice-oriented courses, such as Laboratory Techniques, where sustained engagement, active participation, and consistent involvement are crucial to achieving meaningful learning outcomes.

References

- Ainurrohman, F & Handayani, R. (2020). The Influence of Motivation, Learning Discipline, Teacher Competence And Parental Support on Academic Achievement of Students (Study on Gama English Course Sukoharjo). *International Journal of Economics, Business and Accounting Research (IJEBAR)*, 4(4), 1320-1332. <https://jurnal.stie-aas.ac.id/index.php/IJEBAR>
- Budiarti, L. & Muhammad, H.N. (2013). Upaya Guru Dalam Meningkatkan Minat Belajar Di Dalam Pembelajaran Pendidikan Jasmani Melalui Permainan di Sekolah Dasar (Study Pada Kelas III SDN Sawotratap I). *Jurnal Pendidikan*, 1(3), 600-603. <http://ejournal.unesa.ac.id/index.php/jurnal-pendidikan-jasmani/issue/archive>
- Emda, A. (2018). Kedudukan Motivasi Belajar Siswa Dalam Pembelajaran. *Lantanida Journal*, 5(2), 172. <https://doi.org/10.22373/lj.v5i2.2838>
- Feri, K. E. (2020). Pengimplementasi E-Modul Etnokonstruktivisme Terhadap Motivasi Belajar Peserta Didik Kelas V Sekolah Dasar. *Jurnal Penelitian Ilmu Pendidikan*, 13(1), 10-21. <http://journal.uny.ac.id/index.php/jpip>

- Indah, S. (2018). Motivasi Belajar Mahasiswa Program Studi Manajemen Dalam Penguasaan Keterampilan Berbicara (Speaking) Bahasa Inggris. *Jurnal Manajemen Tools*, 9(1), 41-52. <https://jurnal.pancabudi.ac.id/index.php/JUMANT/article/view/191>
- Joyce S, P. & Schultheiss, O. C. (2005). Assessing Implicit Motives in U.S. College Students: Effects of Picture Type and Position, Gender and Ethnicity, and Cross-Cultural Comparisons. *Journal of Personality Assessment*, 85(3), 280-294. https://doi.org/10.1207/s15327752jpa8503_04
- Kasari, W & Sawitri, D.R. (2020). Hubungan Antara Penyesuaian Diri Dengan Motivasi Belajar Pada Siswa Kelas X Di SMA Negeri 8 Puworejo. *Jurnal EMPATI*, 7(1), 368-372. <https://doi.org/10.14710/empati.2018.20250>
- Lutfiwati, S. (2020). Motivasi Belajar Dan Prestasi Akademik. *Jurnal Kependidikan Islam*, 10(1), 54-63. <https://doi.org/10.24042/alidarah.v10i1.5642>
- Muhammad, M. (2016). Pengaruh Motivasi Dalam Pembelajaran. *Lantanida Journal*, 4(2), 90. <https://doi.org/10.22373/lj.v4i2.1881>
- Muhammedi, Elfidayati, Kamliah, Dahlan, Z., Hanum, L., Harahap, F. A., Albina, M. & Lubis, S. A. (2017). *PSIKOLOGI BELAJAR*. Sumatera Utara. LARISPA Indonesia. <http://repository.uinsu.ac.id/id/eprint/16299>
- Nurchaya, S & Meliana, S.F. Hubungan Antara Perhatian Orang Tua dan Kemandirian Belajar Pada Siswa Kelas IV SDN Pinang Ranti 01. *Jurnal Ilmiah Pendidikan Dasar*, 6(2), 151-160. <https://doi.org/10.23969/jp.v6i2.4580>
- Pebriani, D & Oktarina, N. (2018). Pengaruh Disiplin Fasilitas dan Motivasi Belajar Terhadap Kecepatan Mengetik Manual. *Economic Education Analysis Journal*, 7(2), 568-583. <https://journal.unnes.ac.id/sju/eeaj/article/view/28276>
- Sobandi & Rizki. (2017). Pengaruh Motivasi Belajar Terhadap Hasil Belajar Bahasa Indonesia Pada Siswa Kelas VIII MTS Negeri 1 Padangaran. *Jurnal DIKSATRASIA*. 1(2). 306-310. https://r.search.yahoo.com/_ylt=Awrg4Jd_7HhpL3EC3NpXNyoA;_ylu=Y29sbwNncTEEcG9zAzIEdnRpZAMEc2VjA3Ny/RV=2/RE=1770742143/RO=10/RU=https%3a%2f%2fjurnal.unigal.ac.id%2fdiksatria%2farticle%2fdownload%2f634%2f529/RK=2/RS=kmmf8zrvdqFSKJrmf_yPrxi4Qy0-
- Uno, H. B. (2023). *Teori Motivasi & Pengukuran Analisis Di Bidang Pendidikan*. Jakarta: PT Bumi Aksara. https://www.google.co.id/books/edition/Teori_Motivasi_dan_Pengukurannya/lOqoEA_AAQBAJ?hl=id&gbpv=0
- Zahrani, N. (2018). Uji Validitas Konstruk Pada Instrumen Self-Esteem Inventory Dengan Metode Confirmatory Factor Analysis (CFA). *Jurnal Pengukuran Psikologi dan Pendidikan Indonesia (JP3I)* 5(1). <http://dx.doi.org/10.15408/jp3i.v5i1.9241>
- Zulfa, M & Pramono, H. (2017). Aktivitas Olahraga Pada Masyarakat Pesisir Di Kabupaten Tegal. *Journal of Physical Education, Sport, Health and Recreation*, 6(1), 1613-1620. <http://journal.unnes.ac.id/sju/index.php/peshr>