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Academic anxiety among first-year biology education students in basic biology courses in Papua

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ABSTRACT

Academic anxiety is a significant concern among first-year university students, yet its dimensional profile among biology education students in Papua remains empirically undocumented. This study aimed to describe the level and dimensional patterns of academic anxiety among first-year Biology Education students in the context of their Basic Biology course in Papua. A quantitative descriptive survey design was employed. The samples consisted of second-semester Biology Education students at a state university in Papua Province during the 2023/2024 academic year ($n = 33$), selected through total sampling. Data were drawn from the anxiety dimension of an instrument adapted from the Learning Stress Perception scale (LSP), comprising 11 items on an 8-point Likert scale, with established content validity and internal consistency (Cronbach's $\alpha = 0.70$). Anxiety levels were categorized using the Mean \pm 1SD normative criterion ($M = 4.37$, $SD = 1.54$). Results indicated that the majority of students (69.7%) fell within the moderate anxiety category, with equal proportions classified as low (15.2%) and high (15.2%) anxiety. Across the four dimensions examined, exam anxiety recorded the highest mean, followed by academic and future failure anxiety, learning anxiety, and personal anxiety, with all dimensions falling within the moderate range. These findings contribute preliminary empirical evidence on academic anxiety among first-year biology education students in a geographically underrepresented higher education context in Eastern Indonesia, though they should be interpreted cautiously given the descriptive design and limited sample size.



INTRODUCTION

First-year students experience significant changes at the beginning of their studies at university, particularly in the learning process, which shifts from active teacher guidance in secondary school to independent learning in higher education (García-Martínez et al., 2021; Thompson et al., 2021; Tuero et al., 2024). According to several studies, this transition is often associated with psychological pressure on first-year students, including academic demands, stress, time management difficulties, anxiety, and depression (Beiter et al., 2015; Thompson et al., 2021). The first year of university is therefore a critical transition period that requires special attention, and for students in science education programs, this pressure is potentially more intense given the distinctive characteristics of their curriculum.

Based on preliminary studies conducted at several universities in Indonesia, students in science education programs complete 22–24 credit hours (SKS) and take an average of 6–8 subjects per semester. In the first year, three subjects with both theoretical and practical components are studied in the same semester: Basic Biology, Basic Physics, and Basic Chemistry. The simultaneous demands of theory and laboratory work across several science disciplines have been empirically linked to high levels of anxiety in first-year science students (England et al., 2019b; Macher et al., 2013), indicating that the structure of science education programs' curricula has the potential to create additional psychological pressure at a time when students are still in the early stages of transitioning to university life.

This issue may not receive adequate attention, given that learning at the university level is more focused on content mastery than on monitoring students' psychological state. In cognitive terms, psychological pressure in learning has been linked to deficits in memory retrieval and updating, and has been shown to hinder knowledge transfer and reduce cognitive flexibility in problem solving (Vogel & Schwabe, 2016), a mechanism highly relevant to basic science courses that require both conceptual understanding and procedural skills. If not identified and addressed, this condition can directly impact learning outcomes; students with higher levels of anxiety tend to achieve lower academic performance (Deasy et al., 2016; Lin & Huang, 2014; Vitasari et al., 2010), and in the most severe cases, may lead students to drop out of their program of study.

Anxiety is generally defined as an emotional state characterized by feelings of tension, worry, and apprehension that arise in response to perceived threats, whether real or imagined, accompanied by activation of the autonomic nervous system (Spielberger et al., 1983). In an academic context, anxiety takes a more specific form. Cassady (2010), defines academic anxiety as a unifying formulation encompassing the various forms of anxiety that students experience during the learning process, including test anxiety, anxiety toward specific subjects, and general evaluative pressure. Among the various psychological pressures experienced by first-year students, academic anxiety is the condition that manifests earliest compared to depression or general stress (Haruna et al., 2025). If left unidentified and unaddressed at an early stage, anxiety has the potential to develop into more serious psychological distress, making it an early warning signal that is most readily detectable in an academic context (Cassady et al., 2019). While stress, depression, and anxiety often occur simultaneously, academic anxiety is often the first condition that students can recognize themselves because of its direct link to concrete learning situations (Cassady et al., 2019; Liu et al., 2023). In an educational context, academic anxiety manifests across various domains, including test anxiety, statistics anxiety, and social anxiety, each with consequences for academic performance (Kusumastuti, 2020).

The diversity of these domains indicates that academic anxiety is multidimensional and context-specific; however, its expression in science education programs, particularly in first-year foundational science courses, has not been widely studied compared to other academic contexts. University students represent a vulnerable population susceptible to anxiety triggered by academic stressors; one study reported that nearly a quarter of this population experiences anxiety at a level that affects their academic functioning (Cao et al., 2020). These findings

collectively demonstrate that academic anxiety is not merely a personal disposition, but a phenomenon shaped by context, particularly evident in science education settings where cognitive and affective demands converge (Agustiani & Savira, 2022).

Despite growing attention to the psychological well-being of students in higher education, academic anxiety among first-year students in biology education programs remains underexplored. Studies in this area have generally focused on students at large institutions in Indonesia (Agustiani & Savira, 2022; Kusumastuti, 2020), while the context of Papua has not been adequately represented in the empirical literature. Furthermore, although anxiety in the general student population has been well documented (Cao *et al.*, 2020). Its specific dimensional expression in foundational science courses, particularly Basic Biology, which requires simultaneous theoretical and practical engagement in the first semester, has not been systematically described.

Anxiety that develops at the beginning of a student's studies can accumulate and interfere with future academic success, making it both practically and academically urgent to understand its patterns and dimensions at this stage. Based on the identified research gap, this study aims to describe the level and dimensional patterns of academic anxiety among first-year biology education students in the context of the Basic Biology course at a university in Papua. Given that natural science, biology, chemistry, and physics education programs share a similar first-year curriculum structure, namely a combination of theory and practical work across disciplines within the same semester, findings from the biology education context may offer preliminary insights relevant to other programs within the science education cluster.

METHODS

Research Design

This study employed a quantitative descriptive survey design to describe the academic anxiety of first-year biology education students in the context of the Basic Biology course. This approach provides a description of the distribution of anxiety using frequency, percentage, mean, and standard deviation (Creswell & Creswell, 2017).

Participants

This study was conducted at a state university in Papua Province offering a Biology Education program. A convenience sampling approach was used to select the study site, as the university was accessible to the researcher. Given the small and manageable population size at the selected institution ($n = 33$), total sampling was then applied, with all registered second-semester Biology Education students in the 2023/2024 academic year included as participants (Fraenkel & Wallen, 1990). Although Basic Biology is offered in the first semester, data were collected in the second semester to ensure that all participants had completed the course and could reflect on their actual learning experiences rather than anticipated ones. All participants were informed that participation was voluntary and that they could withdraw at any time without academic consequences, and written informed consent was obtained prior to data collection. The sample comprised 20 female (60.6%) and 13 male (39.4%) students. In terms of ethnic background, the majority were Papuan students (84.8%, $n = 28$), while the remainder were non-Papuan students (15.2%, $n = 5$).

Instruments

Data were collected using an instrument developed through adaptation of the Learning Stress Perception (LSP) scale (Bedewy & Gabriel, 2015) to the context of the Basic Biology course. The adaptation process involved content validation by two experts in biology education and cognitive psychology. The original LSP scale reported acceptable internal consistency (Cronbach's $\alpha = 0.70$). This study used only the 11-item anxiety dimension of the adapted instrument, administered on

an 8-point Likert scale (1 = strongly disagree; 8 = strongly agree). An even-numbered scale was used to eliminate neutral responses and encourage definitive positions (Chyung et al., 2017), while an eight-point scale provided sufficient response granularity to capture nuanced variation in anxiety levels, consistent with evidence that scales with more than four response categories yield superior psychometric properties in terms of reliability, validity, and discriminating power (Preston & Colman, 2000). The 11 items were grouped into four thematic dimensions based on the consistency of item constructs and their alignment with anxiety dimensions identified in prior research on academic anxiety: (1) exam anxiety, referring to worry and apprehension surrounding examinations and academic assessments; (2) learning anxiety, pertaining to difficulties and discomfort experienced during the learning process; (3), academic and future failure, reflecting concerns about future academic and professional outcomes; and (4) personal anxiety, capturing perceived demands from lecturers and family members.

Procedure

This study conducted a secondary analysis of data from a parent study examining learning stress among biology education students in Papua (Rahmadana et al., 2026). The original data were collected during the second semester of the 2023/2024 academic year. The questionnaire was distributed and completed online via Google Form (Vasanth Raju & Harinarayana, 2016). The present analysis focused specifically on the anxiety dimension from the participating sample ($n = 33$).

Data Analysis

Data analysis focused exclusively on the anxiety dimension extracted from the parent dataset. For each respondent, an overall anxiety score was calculated as the mean of the 11 anxiety items (range: 1–8). Descriptive statistics, including frequency, percentage, mean, and standard deviation, were computed to characterize the distribution of anxiety levels. Anxiety levels were categorized into three groups — low anxiety, Moderate anxiety, and high anxiety — using a distribution-based classification approach. Categorization was based on the mean and standard deviation of respondents' overall scores ($M = 4.37$, $SD = 1.54$), where the SD represents variability in respondent mean scores rather than item-level variability. The Mean \pm 1SD criterion was applied, following recommendations for categorical grouping in educational measurement (Cohen et al., 2021; Saifuddin, 2012). This approach enables classification relative to the sample's central tendency and variability. The resulting classification thresholds are presented in Table 1.

Table 1

The anxiety level classification criteria.

Anxiety level	Score criterion	Score range
Low anxiety	$x < M - 1SD$	$x < 2.82$
Moderate anxiety	$M - 1SD \leq x \leq M + 1SD$	$2.82 \leq x \leq 5.91$
High anxiety	$x > M + 1SD$	$x > 5.91$

Note: M = Mean (4.37), SD = Standard Deviation (1.54). Threshold values were derived from unrounded statistics ($M = 4.3664$, $SD = 1.5432$) and rounded independently to two decimal places.

Based on these thresholds, individual mean scores below 2.82 indicated low anxiety, scores between 2.82 and 5.91 indicated Moderate anxiety, and scores above 5.91 indicated high anxiety. Each respondent was assigned to one category based on their individual mean score.

RESULTS AND DISCUSSION

Questionnaire results from 33 respondents showed that 15.2% were in the high anxiety category, 69.7 % were in the Moderate anxiety category, 15.2% in the low anxiety category (Table 2).

Table 2

The summary of anxiety level distribution.

Category	Range	f	Percentage
Low anxiety	$x < 2.82$	5	15.2%
Moderate anxiety	2.82 – 5.91	23	69.7%
High anxiety	$x > 5.91$	5	15.2%
Total		33	100%

The majority of students (69.7%) fell within the Moderate anxiety category. Equal proportions were classified as low anxiety (15.2%) and high anxiety (15.2%). All students reported some degree of anxiety, with no student scoring below the low anxiety threshold. Table 3 presents the mean score for each questionnaire item. All survey items fell within the Moderate anxiety category (M range: 3.73–5.03). Items P2 and P10, which measure exam-related anxiety, yielded the highest mean scores (M = 4.94 and M = 5.03, respectively). Anxiety toward specific biology topics (P6) recorded the third-highest mean score (M = 4.73) (Table 3).

Table 3

The mean scores and anxiety categories of each survey item.

	Statement Item	Average Score	SD	Anxiety Category
1	I am afraid of failing/not passing the basic biology course.	4.27	2.34	Moderate anxiety
2	I feel that my weakness is worrying too much about the exam.	4.94	2.37	Moderate anxiety
3	Even though I passed the basic biology course, I was still worried about my future career.	4.48	2.39	Moderate anxiety
4	I feel anxious when learning basic biology.	3.73	1.84	Moderate anxiety
5	I feel better not asking questions even if I haven't understood the material being taught.	4.15	2.36	Moderate anxiety
6	I feel anxious about certain biology materials	4.73	2.08	Moderate anxiety
7	The lecturers criticized my performance and assignments in lectures.	3.94	2.33	Moderate anxiety
8	The lecturers have unrealistic expectations of me.	4.03	2.21	Moderate anxiety
9	My family has unrealistic expectations of me.	4.27	2.64	Moderate anxiety
10	The exam was very stressful for me.	5.03	2.32	Moderate anxiety
11	I feel that I experienced stress at the beginning of my studies	4.45	2.24	Moderate anxiety
	Overall	4.37	2.26	Moderate anxiety

Note: SD values represent the standard deviation of individual item scores across respondents (n = 33). Overall mean and SD are calculated as the unweighted average of the 11 item-level statistics.

All items recorded mean scores within the Moderate anxiety range. Exam-related items (P2, P10) showed higher mean scores compared to general learning anxiety items (P4). The eleven items were theoretically grouped into four dimensions of anxiety based on thematic focus. The eleven items grouped into four dimensions of academic anxiety are presented in Table 4.

Table 4

Grouping of survey items by academic anxiety dimension.

Dimension	Item	Mean	SD
Exam anxiety	P2, P10	4.98	2.02
Academic and future failure anxiety	P1, P3	4.38	1.80
Learning anxiety	P4, P6, P11	4.30	1.48
Personal anxiety	P5, P7, P8, P9	4.10	1.79
Overall		4.37	1.75

Note: Dimension means represent the average of item means within each dimension. SD values reflect variability in respondent-level dimension scores across the sample ($n = 33$). The overall SD (1.75) represents the weighted average of dimension-level standard deviations, weighted by the number of items per dimension.

Table 4 shows that exam anxiety recorded the highest mean score ($M = 4.98$) despite comprising only two items. Personal anxiety, which included four items, recorded the lowest mean score among the dimensions ($M = 4.10$). This study examined the academic anxiety profile of first-year biology education students in the context of Basic Biology instruction at a university in Papua. The findings indicate that academic anxiety was distributed across the entire sample, with the majority of respondents (69.7%) falling within the Moderate anxiety category, while equal proportions were recorded in the low anxiety (15.2%) and high anxiety (15.2%) categories. This pattern suggests individual variation in academic anxiety experiences among students in this sample. At the item level, four items recorded the highest mean scores: "The exam was very stressful for me" (P10, $M = 5.03$), "I feel that my weakness is worrying too much about the exam" (P2, $M = 4.94$), "I feel anxious about certain biology materials" (P6, $M = 4.73$), and "Even though I passed the Basic Biology course, I was still worried about my future career" (P3, $M = 4.48$). Items related to examinations and specific biology content recorded the highest mean scores, indicating that these domains were relatively more prominent in the anxiety profile of this sample compared to other domains.

When items were grouped into four theoretical dimensions, exam anxiety recorded the highest mean ($M = 4.98$), followed by academic and future failure anxiety ($M = 4.38$), learning anxiety ($M = 4.30$), and personal anxiety ($M = 4.10$). Although all dimensions fell within the Moderate anxiety range, differences in mean scores across dimensions suggest that evaluation-related anxiety was relatively higher than interpersonal anxiety in this context. Standard deviation values at the dimension level ranged from 1.48 to 2.02, with exam anxiety recording the highest variability ($SD = 2.02$) and learning anxiety recording the lowest ($SD = 1.48$). This pattern suggests that experiences of examination-related anxiety varied more widely across students than anxiety in the learning context, although further interpretation requires a more comprehensive research design.

The distribution of students across the low (15.2%), moderate (69.7%), and high (15.2%) anxiety categories indicates individual variation in anxiety experiences. These findings suggest that while Moderate anxiety appears normative among first-year biology education students in this sample, evaluation-related concerns were the most prominent domain in the overall anxiety profile.

Exam Anxiety

Exam anxiety is defined as intense fear or worry experienced before and during examinations (Jirjees et al., 2024). The present study found that exam-related items (P2, P10) recorded the highest mean scores among all survey items ($M = 4.94$ and $M = 5.03$, respectively), with exam anxiety emerging as the most intense dimension overall ($M = 4.98$). Although these scores remained within the Moderate anxiety category, their values approached the upper boundary of this range, suggesting that assessment situations represented the most prominent concern within this sample.

These findings are consistent with broader evidence indicating that exam anxiety is prevalent among university students (Jirjees et al., 2024; Kassaw et al., 2024). The prominence of exam-related items in the present study is consistent with patterns reported in introductory biology contexts, where test anxiety has been identified as the most elevated anxiety type among enrolled students (England et al., 2019). Prior research has documented negative associations between academic anxiety and academic achievement (Aristawati et al., 2020; Awadalla et al., 2024), although this relationship is not always straightforward. England et al., (2019) found that test anxiety among introductory biology students was not predictive of final course grades, suggesting that contextual factors may mediate this relationship. Previous studies have also reported that exam anxiety tends to be more prominent among female students, first-year students, and students with lower grade point averages (Jirjees et al., 2024; Kassaw et al., 2024), although demographic analyses were not conducted in the present study. While moderate levels of anxiety may facilitate academic performance by enhancing motivation (Hooda & Saini, 2017; Putwain & Daly, 2014), excessive anxiety can interfere with concentration and academic achievement (Aristawati et al., 2020).

Both exam-related items recorded substantial standard deviations (P2: $SD = 2.37$; P10: $SD = 2.32$), reflecting considerable individual variation in exam anxiety experiences within this sample. This is consistent with evidence that test anxiety varies substantially among university students (von der Embse et al., 2018). The heterogeneity observed in this sample suggests that exam anxiety was not experienced uniformly, although the specific factors contributing to this variation were not examined in the present study.

Academic and Future Failure Anxiety

The academic and future failure anxiety dimension, comprising items P1 and P3, recorded a mean score of 4.38, making it the second-highest anxiety dimension after exam anxiety. Item P1 ("I am afraid of failing/not passing the Basic Biology course") recorded a mean of 4.27, while item P3 ("Even though I passed the Basic Biology course, I was still worried about my future career") recorded a mean of 4.48. Both items fell within the Moderate anxiety category (P1: $SD = 2.34$; P3: $SD = 2.39$).

Anxiety related to course failure among first-year students can be understood in the context of the transition from secondary school to higher education, where greater academic independence, different assessment mechanisms, and heavier workloads may give rise to self-doubt regarding one's academic capabilities, as first-year students are particularly vulnerable to academic anxiety during this transition (Haruna et al., 2025; Ruiz-camacho & Gozalo, 2025). The moderate level of career anxiety reflected in P3 ($M = 4.48$) suggests that professional concerns emerge relatively early in students' academic trajectories, consistent with studies documenting career-related anxiety among university students (Karpika & Segel, 2021; Ladejo, 2023; Maharani et al., 2021). Labour market uncertainty, where higher education credentials do not always guarantee expected employment outcomes, may further compound this anxiety (Hossain et al., 2018; Krajnakova et al., 2020). Academic stress left unaddressed in the early stages of study has also been associated with declining academic achievement and motivation over time (Pascoe et al., 2020)

The substantial standard deviations recorded for both items (P1: SD = 2.34; P3: SD = 2.39) reflect considerable individual variation in the experience of academic and future failure anxiety among students in this sample. This heterogeneity suggests that students did not experience anxiety related to academic outcomes and career prospects uniformly, although the specific factors contributing to this variation were not examined in the present study.

Learning Anxiety

The learning anxiety dimension comprised three items: P4 ("I feel anxious when studying Basic Biology"), P6 ("I feel anxious about certain biology materials"), and P11 ("I feel that I experienced stress at the beginning of my studies"). This dimension recorded a mean score of 4.30. Item P4 recorded a mean of 3.73, item P6 recorded a mean of 4.73, and item P11 recorded a mean of 4.45. All three items fell within the Moderate anxiety category (P4: SD = 1.84; P6: SD = 2.08; P11: SD = 2.24).

The difference between P4 (M = 3.73) and P6 (M = 4.73) is noteworthy, with anxiety toward specific biology materials considerably higher than anxiety toward biology learning in general. This pattern suggests that anxiety in this sample may be content-specific rather than reflecting a general aversion to the biology discipline as a whole. These findings are consistent with research indicating that science-related anxiety tends to be domain-specific, varying not only across science subdisciplines such as biology, chemistry, and physics (Megreya & Emadi, 2024), but also across topics within the same discipline, where certain biology topics have been documented to generate higher levels of anxiety than others, such as variation and evolution, which are historically regarded as subjects feared by learners (Onowugbeda et al., 2023). Science anxiety is broadly recognised as a significant phenomenon in the context of STEM education (Khafizova, 2024).

Item P11 recorded a mean of 4.45 with the highest standard deviation among the three items in this dimension (SD = 2.24), reflecting considerable variability in how students experienced stress at the beginning of their university studies. Research has documented that anxiety levels among first-year students vary substantially from the outset, with some students already presenting significant anxiety symptoms upon entering university (Duffy et al., 2020). This heterogeneity suggests that students in this sample did not experience early academic stress uniformly, although the specific contributing factors were not examined in the present study. This pattern overall suggests that learning anxiety in this sample was more content-specific than reflective of a general aversion to the biology discipline.

Personal Anxiety

The personal anxiety dimension comprised four items: P5 ("I feel it is better not to ask questions even if I have not understood the material being taught"), P7 ("Lecturers criticise my performance and assignments in lectures"), P8 ("Lecturers have unrealistic expectations of me"), and P9 ("My family has unrealistic expectations of me"). This dimension recorded a mean score of 4.10, the lowest among the four anxiety dimensions. Item means ranged from 3.94 (P7) to 4.27 (P9), with all items falling within the Moderate anxiety category.

Within this dimension, family expectations (P9, M = 4.27) had the highest mean and standard deviation among all survey items (SD = 2.64), indicating substantial individual variability in family-related anxiety. Transitioning to university requires students to adapt to a novel academic and social environment while simultaneously managing family expectations regarding academic performance, which for some students may constitute an additional source of evaluative pressure (Ladejo, 2023). Family-related demands concerning academic major choices and career prospects have been associated with future anxiety among university students, with family pressure contributing to feelings of anxiety when such expectations are perceived as difficult to meet (Karpika & Segel, 2021; Maharani et al., 2021). The relatively high score for reluctance to ask questions (P5, M = 4.15, SD = 2.36) is consistent with classroom participation anxiety documented in science education contexts, where students have been reported to experience anxiety when

expected to answer questions in front of instructors or peers (England et al., 2019). Lecturer-related items recorded the lowest means within this dimension (P7: $M = 3.94$, $SD = 2.33$; P8: $M = 4.03$, $SD = 2.21$). All items in this dimension recorded standard deviations exceeding 2.2, reflecting considerable variability across the sample.

Personal anxiety recorded the lowest mean score ($M = 4.10$) among all dimensions in this sample. The observed pattern with family expectations recording the highest score, followed by reluctance to ask questions and lecturer-related concerns, suggests that sources of anxiety within this dimension varied, with family-related pressure being the most prominent in this sample.

CONCLUSION

The findings indicate that academic anxiety was predominantly at the moderate level across the sample. Among the four dimensions examined, exam anxiety was the most prominent, followed by academic and future failure anxiety, learning anxiety, and personal anxiety, with all dimensions falling within the moderate range. Career-related anxiety, previously associated mainly with final-year students, was also observed among first-year students, as was anxiety stemming from family expectations. These findings contribute preliminary empirical evidence on academic anxiety in a geographically underrepresented higher education context in Eastern Indonesia, with potential relevance for other science education programs sharing a similar first-year curriculum structure. However, given the descriptive design and limited sample size, findings should be interpreted cautiously.

REFERENCES

- Agustiani, P., & Savira, S. I. (2022). Perbedaan kecemasan akademik ditinjau dari angkatan masuk pada mahasiswa di masa pandemi covid-19. *Jurnal Penelitian*, 9(3), 149–161. <https://doi.org/10.26740/cjpp.v9i3.46601>
- Aristawati, A. R., Pratitis, N., & Ananta, A. (2020). Kecemasan akademik mahasiswa menjelang ujian ditinjau dari jenis kelamin. *Jurnal Penelitian Psikologi*, 1(01), 73–80. <https://jurnal.untagsby.ac.id/index.php/sukma/article/view/3637>
- Awadalla S, Davies EB, Glazebrook C. 2024. The impact of depressive and anxiety symptoms on academic achievement among undergraduate university students: A systematic review. *OBM Neurobiology* 8(4), 1-24. <https://doi.org/10.21926/obm.neurobiol.2404261>
- Bedewy, D., & Gabriel, A. (2015). Examining perceptions of academic stress and its sources among university students: the perception of academic stress scale. *Health Psychology Open*, 2(2). <https://doi.org/10.1177/2055102915596714>
- Beiter, R., Nash, R., McCrady, M., Rhoades, D., Linscomb, M., Clarahan, M., & Sammut, S. (2015). The prevalence and correlates of depression, anxiety, and stress in a sample of college students. *Journal of Affective Disorders*, 173, 90–96. <https://doi.org/10.1016/j.jad.2014.10.054>
- Cao, W., Fang, Z., Hou, G., Han, M., Xu, X., & Dong, J. (2020). The psychological impact of the COVID-19 epidemic on college students in China. *Psychiatry Research*, 287(March), 112934. <https://doi.org/10.1016/j.psychres.2020.112934>
- Cassady, J. C. (2010). *Anxiety in schools: The causes, consequences, and solutions for academic anxieties* (Vol. 2). Peter Lang.
- Cassady, J. C., Pierson, E. E., & Starling, J. M. (2019). Predicting student depression with measures of general and academic anxieties. *Frontiers in Education*. <https://doi.org/10.3389/feduc.2019.00011>
- Chyung, S. Y. (Yonnie), Roberts, K., Swanson, I., & Hankinson, A. (2017). Evidence-Based Survey Design: The Use of a Midpoint on the Likert Scale. *Performance Improvement*, 56(10), 15–23. <https://doi.org/https://doi.org/10.1002/pfi.21727>

- Cohen, R. J., Swerdlik, M. E., & Phillips, S. M. (2021). *Psychological testing and assessment*. McGraw-Hill US Higher Ed USE New York, NY, USA.
- Creswell, J. W., & Creswell, J. D. (2017). *Research design: Qualitative, quantitative, and mixed methods approaches*. Sage publications.
- Deasy, C., Coughlan, B., Pironom, J., Jourdan, D., & Mannix-McNamara, P. (2016). Psychological distress and help seeking amongst higher education students: findings from a mixed method study of undergraduate nursing/midwifery and teacher education students in Ireland. *Irish Educational Studies*, 35(2), 175–194. <https://doi.org/10.1080/03323315.2016.1146157>
- Duffy, A., Keown-Stoneman, C., Goodday, S., Horrocks, J., Lowe, M., King, N., Pickett, W., McNeven, S. H., Cunningham, S., Rivera, D., Bisdounis, L., Bowie, C. R., Harkness, K., & Saunders, K. E. A. (2020). Predictors of mental health and academic outcomes in first-year university students: Identifying prevention and early-intervention targets. *BJPsych Open*, 6(3), e46. <https://doi.org/10.1192/bjo.2020.24>
- England, B. J., Brigati, J. R., Schussler, E. E., & Chen, M. M. (2019b). Student anxiety and perception of difficulty impact performance and persistence in introductory biology courses. *CBE—Life Sciences Education*, 18(2), ar21. <https://doi.org/10.1187/cbe.17-12-0284>
- Fraenkel, J. R., & Wallen, N. E. (1990). *How to design and evaluate research in education*. ERIC.
- García-Martínez, I., Pérez-Navío, E., Pérez-Ferra, M., & Quijano-López, R. (2021). Relationship between emotional intelligence, educational achievement and academic stress of pre-service teachers. *Behavioral Sciences*, 11(7). <https://doi.org/10.3390/bs11070095>
- Gunawan, R., & Hendriani, W. (2019). Psychological well-being pada guru honorer di Indonesia : a literature review. *Psikoislamedia Jurnal Psikologi*, 4(1), 105–113.
- Hammad, M. A. (2016). Future anxiety and its relationship to students ' attitude toward academic specialization. *Journal of Education and Practice*, 7(15), 54–65. <https://eric.ed.gov/?id=EJ1103253>
- Haruna, U., Mohammed, A.-R., & Braimah, M. (2025). Understanding the burden of depression, anxiety and stress among first-year undergraduate students. *BMC Psychiatry*, 25(1), 632. <https://doi.org/10.1186/s12888-025-07069-8>
- Hooda, M., & Saini, A. (2017). Academic anxiety: An overview. *Educational Quest: An Int. J. of Education and Applied Social Science*, 8(3), 807–810. <https://doi.org/10.5958/2230-7311.2017.00139.8>
- Hossain, M. I., Yagamaran, K. S. A. P., Afrin, T., Limon, N., & Karim, A. M. (2018). Factors influencing unemployment among fresh graduates : A case study in Klang Valley , Malaysia. *International Journal of Academic Research in Business and Social Sciences*, 8, 1495-1507. <https://doi.org/10.6007/IJARBS/v8-i9/4859>
- Jirjees, F., Odeh, M., Al-Haddad, A., Ass' ad, R., Hassanin, Y., Al-Obaidi, H., Kharaba, Z., Alfoteih, Y., & Alzoubi, K. H. (2024). Test anxiety and coping strategies among university students an exploratory study in the UAE. *Scientific Reports*, 14(1), 25835. <https://doi.org/10.1038/s41598-024-59739-4>
- Karpika, I. P., & Segel, N. W. W. (2021). Quarter life crisis terhadap mahasiswa studi kasus di fakultas keguruan dan ilmu pendidikan Universitas PGRI Mahadewa Indonesia. *Widyadari*, 22(2), 513–527. <https://doi.org/10.5281/zenodo.5550458>
- Kassaw, C., Demareva, V., Getu, S., Negash, M., & Alemayehu, S. (2024). A psychological reaction of higher education students to the new national exit exam in the case of Dilla University, 2023. *Frontiers in Psychology*, 15, 1431707. <https://doi.org/10.3389/fpsyg.2024.1431707>
- Khafizova, A. A., Zhdanov, S. P., Beltyukova, O. V., Lapidus, N. I., Grebenshchikova, L. Y., & Lushchik, I. V. (2024). A bibliometric analysis covering the relevant literature on science anxiety over two decades. *Eurasia Journal of Mathematics, Science and Technology Education*, 20(3), em2411. <https://doi.org/10.29333/ejmste/14283>
- Krajnakova, E., Pilinkiene, V., & Bulko, P. (2020). Determinants of economic development and employability of higher education institutions graduates. *Engineering Economics* 31(2), 211–

220. DOI: [10.5755/j01.ee.31.2.24751](https://doi.org/10.5755/j01.ee.31.2.24751)
- Kusumastuti, D. (2020). Kecemasan dan prestasi akademik pada mahasiswa. *Analitika*, 12(1), 22–33. <https://doi.org/10.31289/analitika.v12i1.3110>
- Ladejo, J. (2023). A thematic analysis of the reported effect anxiety has on university students. *Education and Urban Society*. <https://doi.org/10.1177/00131245211062512>
- Lin, S.-H., & Huang, Y.-C. (2014). Life stress and academic burnout. *Active Learning in Higher Education*, 15(1), 77–90. <https://doi.org/10.1177/1469787413514651>
- Liu, X., Zhang, Y., Gao, W., & Cao, X. (2023). Developmental trajectories of depression, anxiety, and stress among college students: a piecewise growth mixture model analysis. *Humanities and Social Sciences Communications*. 10, 736. <https://doi.org/10.1057/s41599-023-02252-2>
- Macher, D., Paechter, M., Papousek, I., Ruggeri, K., Freudenthaler, H. H., & Arendasy, M. (2013). Statistics anxiety, state anxiety during an examination, and academic achievement. *The British Journal of Educational Psychology*, 83(Pt 4), 535–549. <https://doi.org/10.1111/j.2044-8279.2012.02081.x>
- Maharani, F. P., Karmiyati, D., & Widyasari, D. C. (2021). Kecemasan masa depan dan sikap mahasiswa terhadap jurusan akademik. *Cognicia*, 9(1), 11–16. <https://doi.org/10.22219/cognicia.v9i1.15292>
- Megreya, A. M., & Emadi, A. A. Al. (2024). The impact of cognitive emotion regulation strategies on math and science anxieties with or without controlling general anxiety. *Scientific Reports*, 1–11. <https://doi.org/10.1038/s41598-024-70705-y>
- Onowugbeda, F. U., Agbanimu, D. O., Okebukola, P. A., Ibukunolu, A. A., Tokunbo Odekeye, O., & Olori, O. E. (2023). Reducing anxiety and promoting meaningful learning of biology concepts through a culturally sensitive and context-specific instructional method. *International Journal of Science Education*, 45(15), 1303–1320. <https://doi.org/10.1080/09500693.2023.2202799>
- Pascoe, M. C., Hetrick, S. E., & Parker, A. G. (2020). The impact of stress on students in secondary school and higher education. *International Journal of Adolescence and Youth*, 25(1), 104–112. <https://doi.org/10.1080/02673843.2019.1596823>
- Preston, C. C., & Colman, A. M. (2000). Optimal number of response categories in rating scales: reliability, validity, discriminating power, and respondent preferences. *Acta Psychologica*, 104(1), 1–15. [https://doi.org/10.1016/S0001-6918\(99\)00050-5](https://doi.org/10.1016/S0001-6918(99)00050-5)
- Putwain, D., & Daly, A. L. (2014). Test anxiety prevalence and gender differences in a sample of English secondary school students. *Educational Studies*, 40(5), 554–570. <https://doi.org/10.1080/03055698.2014.953914>
- Rahmadana, A., Rahmat, A., Rusyati, L., & Cakir, M. (2026). Exploring factors influencing learning stress in basic biology courses: insight from undergraduate students in Papua. *Jurnal IPA & Pembelajaran IPA*, 10(1), 99–115. <https://doi.org/10.24815/jipi.v10i1.427>
- Ruiz-Camacho, C., & Gozalo, M. (2025). Predicting university students' stress responses: the role of academic stressors and sociodemographic variables. *European Journal of Investigation in Health, Psychology and Education*, 15(8), 163. <https://doi.org/10.3390/ejihpe15080163>
- Saifuddin, A. (2012). Penyusunan skala psikologi, Edisi 2. Yogyakarta: Pustaka Pelajar.
- Spielberger, C., Gorsuch, R., Lushene, R., Vagg, P. R., & Jacobs, G. (1983). Manual for the state-trait anxiety inventory (Form Y1 – Y2). In Palo Alto, CA: Consulting Psychologists Press; Vol. IV.
- Thompson, M., & Pawson, C. (2021). Navigating entry into higher education : the transition to independent learning and living independent learning and living. *Journal of Further and Higher Education*, 45(10), 1398–1410. <https://doi.org/10.1080/0309877X.2021.1933400>
- Tuero, E., Bernardo, A. B., Blanco, E., & Vázquez-Merino, D. (2024). University dropout and transfer intention, what is the influence of resilience and social adaptation on the two types of dropout? journal of college student retention: *Research, Theory and Practice*. <https://doi.org/10.1177/15210251241268812>
- Vasantharaju, N., & Harinarayana, N. S. (2016). Online survey tools: A case study of Google Forms. *National conference on scientific, computational & information research trends in engineering*.

- Vitasari, P., Wahab, M. N. A., Othman, A., Herawan, T., & Sinnadurai, S. K. (2010). The relationship between study anxiety and academic performance among engineering students. *Procedia-Social and Behavioral Sciences*, 8, 490-497. <https://doi.org/10.1016/j.sbspro.2010.12.067>
- Vogel, S., & Schwabe, L. (2016). Learning and memory under stress: implications for the classroom. *npj Science of Learning*, 1(1), 1–10. <https://doi.org/10.1038/npjscilearn.2016.11>
- von der Embse, N., Jester, D., Roy, D., & Post, J. (2018). Test anxiety effects, predictors, and correlates: A 30-year meta-analytic review. *Journal of Affective Disorders*, 227, 483–493. <https://doi.org/10.1016/j.jad.2017.11.048>

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