

DEVELOPMENT AND INITIAL PSYCHOMETRIC EVALUATION OF ACADEMIC BUOYANCY INSTRUMENTS FOR FINAL YEAR STUDENTS

Retno Fajarwati^{1*}, Wardhani Utami Dewi², Binti Isrofin³, Muhammad Naim Almarham⁴

University of Muhammadiyah Metro^{1*,2,4}

State University of Semarang³

) Corresponding author, e-mail : retno2wati@ummetro.ac.id^{1}, wardhaniutamidewi@ummetro.ac.id²,
bintiisrofin@mail.unnes.ac.id³, muhammadnaimalmarham@gmail.com⁴

ABSTRACT

Undertaking an undergraduate thesis is a demanding academic phase frequently accompanied by stress and anxiety, underscoring the importance of academic buoyancy, the capacity to deal with everyday academic setbacks. This preliminary study aimed to develop an academic buoyancy instrument for final-year students based on the 5C framework (confidence, coordination, control, composure, and commitment) and to conduct an initial psychometric evaluation through expert judgment, item-total correlation analysis, and internal consistency estimation. Following Azwar's scale development stages, an initial pool of 25 Likert-type items was reviewed by two experts; Content validity was rated highly feasible (subject expert 96%, language expert 86%; mean 91%). The instrument was administered to 104 students writing or about to write their theses. Item-total correlations ranged from 0.103 to 0.495; 24 items met the criteria ($p < 0.05$) and one item (i3) was removed. The final 24 item set yielded a Cronbach's alpha of 0.742, adequate for an early stage instrument and a basis for further validation rather than high-stakes individual decisions.

Keywords

academic buoyancy, instrument development, content validity, item analysis, internal consistency

ABSTRAK

Menyusun skripsi sarjana merupakan tahap akademik yang menantang dan sering kali disertai dengan stres serta kecemasan, sehingga menekankan pentingnya ketahanan akademik, yaitu kemampuan untuk menghadapi rintangan akademik sehari-hari. Studi pendahuluan ini bertujuan untuk mengembangkan instrumen ketahanan akademik bagi mahasiswa tingkat akhir berdasarkan kerangka kerja 5C (keyakinan diri, koordinasi, kendali, ketenangan, dan komitmen) serta melakukan evaluasi psikometrik awal melalui penilaian ahli, analisis korelasi item-total, dan estimasi konsistensi internal. Mengikuti tahapan pengembangan skala yang dikemukakan oleh Azwar, kumpulan awal yang terdiri dari 25 item tipe Likert ditinjau oleh dua ahli; validitas isi dinilai sangat layak (ahli bidang 96%, ahli bahasa 86%; rata-rata 91%). Instrumen tersebut diberikan kepada 104 mahasiswa yang sedang atau akan menyusun skripsi mereka. Korelasi item-total berkisar antara 0,103 hingga 0,495; 24 item memenuhi kriteria ($p < 0,05$) dan satu item (i3) dihilangkan. Kumpulan 24 item akhir menghasilkan nilai Cronbach's alpha sebesar 0,742, yang memadai untuk instrumen pada tahap awal dan dapat dijadikan dasar untuk validasi lebih lanjut, bukan untuk pengambilan keputusan individu yang berisiko tinggi.

Keywords

kemampuan akademik, pengembangan instrumen, validitas isi, analisis item, konsistensi internal

Cara mengutip: Fajarwati, R., Dewi, W. U., Isrofin, B., & Almarham, M. N. (2026). A Preliminary Study on the Development and Validation of an Academic Buoyancy Instrument for Final Year Students. *Nusantara of Research : Jurnal Hasil-Hasil Penelitian Universitas Nusantara PGRI Kediri*, 13(2), 141-149. <https://doi.org/10.29407/nor.v13i2.28517>

INTRODUCTION

The preparation of final assignments is a challenging academic phase for students and is often associated with increased academic pressure, stress, anxiety, and procrastination. A number of studies show that the demands of independent research, uncertainty of results, time constraints, and interaction with supervisors can trigger significant psychological distress in final year students (Peluso et al., 2011; Soysa & Wilcomb, 2015). Barry et al. (2018) found that students who were working on a thesis/thesis reported higher academic stress and anxiety compared to students at the previous stage of study. If left untreated, this distress can reduce academic motivation and engagement and slow down the completion of studies (Sverdlik et al., 2018; Corner et al., 2017).

One of the psychological constructs that is relevant to students' ability to manage daily academic stress is *academic buoyancy*. Martin and Marsh (2008) define it as the capacity to face and rise from routine and normative academic difficulties, such as unsatisfactory grades, increased task demands, or critical feedback. This construct differs from academic resilience which emphasizes the handling of severe and prolonged difficulties. Martin et al. (2010) developed the 5C framework, namely *confidence*, *coordination*, *control*, *composure*, and *commitment*, as the main factors that support *academic buoyancy*. These dimensions have been associated with motivation, self-regulation, engagement, and achievement in various educational contexts (Collie et al., 2017; Martin et al., 2013; Gao, 2025).

Recent studies reinforce the role of *academic buoyancy* in supporting academic learning and well-being. Gao (2025) reported a positive relationship with EFL learner achievement mediated by learning expectations and enjoyment; Chen and Zhang (2025) attribute it to *the self-regulated learning* of doctoral students through a research style that encourages creativity; Dang and Middlemiss (2025) examine its relationship with fear of failure; Yau et al. (2025) identify gender differences through meta-analysis; and Lu et al. (2025) and Chen et al. (2025) associate it with learning satisfaction and adaptability; while Namaziandost and Çelik (2025) link it to academic engagement and achievement.

Although this evidence continues to grow, *academic buoyancy* instruments developed contextually for final year students in Indonesia are still rarely used. In Indonesia, Sitompul (2021) tested the reliability and validity of *academic buoyancy constructs* in 1,352 junior and senior high school students in Bandung using an adaptation of *the Academic Buoyancy Scale* from Martin and Marsh (2008). The results showed that the four-point scale was valid and reliable, with a *standardized loading factor* value of 0.647–0.843, *construct reliability* of 0.823, and *variance extracted* of 0.54. However, the study still focuses on school-level students, using unidimensional instruments, and has not specifically measured the dynamics of *academic buoyancy* in final year students who face typical pressure in completing final projects. Thus, the existing instruments are generally still short and global, such as *the four-point Academic Buoyancy Scale* (Martin & Marsh, 2008) and the adaptation of *the Motivation and Engagement Scale*, and were developed mainly for school-age samples in Western contexts as well as school students in Indonesia. Such instruments generate one overarching *buoyancy* score instead of five different 5C dimensions, and are not designed to capture

the specific stressors of independent final project work, such as supervisor feedback, repetitive revisions, graduation uncertainty, time pressures, as well as prolonged self-regulation demands.

The five dimensions of 5C are particularly relevant to the final project phase. *Confidence* is related to confidence in the ability to complete a thesis; *coordination* related to planning research stages and time management on long projects; *control* is related to the perception that the effort itself affects academic results despite the revision; *Composure* is concerned with managing anxiety during exams and feedback; and *commitment* is concerned with persistence in the face of recurring obstacles. Because the final assignment is long, self-contained, and feedback-intensive, a multidimensional measure aligned with these demands is more informative than a single global score.

Thus, this research is positioned as the initial stage of instrument development, focusing on the preparation of the items and checking the validity of the initial items and internal reliability, rather than on testing a comprehensive measurement model (Azwar, 2012). Specifically, the objectives of the research, which were deliberately narrowed to align with the data and methods, were to: (1) compile *academic buoyancy items* that are relevant to the context of the final project; (2) obtain an expert assessment of the validity of the content; (3) check the item-total correlation of items; (4) estimating the internal consistency of the instrument; and (5) describe the initial profile of *the student's academic buoyancy*. The results are intended as an initial empirical basis for subsequent validation (e.g., exploratory and confirmatory factor analysis), not to support high-risk individual decisions.

METHODS

Research Design

This research is an instrument development research with a quantitative approach, which is explicitly positioned as a preliminary study (initial trial), not a final validation. The procedure follows the stages of development of the psychological scale of Azwar (2012): (1) theoretical and empirical analysis; (2) the formulation of constructs, dimensions, and indicators; (3) writing of items; (4) expert assessment; (5) field trials; and (6) analysis of item validity and internal reliability. This study reported stages 1 to 6. The study was discontinued at Stage 6 because, with a single *sample convenience*, the top priority was to filter the grain and establish initial reliability before deploying resources for the analysis of large sampled factors; the dimensional structure and validity of the construct were provided for the planned follow-up study.

Participants

Participants totaled 104 students who are or will prepare their final projects at one of the private universities in Lampung province. The samples in this study were taken using *the purposive random sampling technique*. Inclusion criteria: (1) being in the final stage of study according to the curriculum of the study program; and (2) be willing to participate voluntarily.

Instruments

The instrument developed was in the form of *an academic buoyancy scale* with a closed format using a four-point Likert response (1 = very inappropriate to 4 = very appropriate). *Academic*

buoyancy is operationalized into the five 5C dimensions (Martin & Marsh, 2008; Martin et al., 2010): *Confidence*, confidence in the ability to complete final projects; *Coordination*, time management, planning, and organization of work; *Control*, the belief that one's own efforts affect academic results; *Composure*, the management of negative emotions (anxiety, panic, worry) during the process; and *Commitment*, persistence and consistency in the face of obstacles. The initial instrument consists of 25 statements representing the five dimensions, combining *favorable* and *unfavorable items*. The grid that maps the items to dimensions is presented in Table 1.

Table 1. Academic Buoyancy Instrument Grid (initial 25 items)

Dimension (5C)	Behavioral indicators	Favorable Outcome	Unfavorable score	Quantity
Confidence	Students' confidence in their competence to overcome academic tasks and challenges	1, 2, 3	4, 5	5
Coordination	Ability to organize and plan academic study/assignments effectively	6, 7, 10	8, 9	5
Commitment	Diligence and responsibility to complete academic assignments despite obstacles	11, 12, 13	14, 15	5
Composure	Ability to manage anxiety and stay calm in the face of academic pressure	16, 17, 18	19, 20	5
Control	Self-control and uncertain situations and confidence to overcome academic barriers	21, 22, 24	23, 25	5
Quantity		15	10	25

Example of a *favorable item*: "I continue to try even though the results of the final project guidance are still a lot of improvements" (*Commitment*). Example of an *unfavorable item* (reverse score): "I delayed completing a final project if I encountered a problem" (*Commitment*).

Expert Assessment and Item Revision

Before the field trial, the items undergo expert assessment to determine the validity of the content. Two experts evaluated the instrument, namely material/content experts and linguists. Each expert assessed ten criteria that included the suitability of the item with the indicator, the clarity and absence of double meaning, the suitability of the language with the respondent, the suitability with the spelling rules, the representativeness of the respondent's condition, the adequacy of the number of items, and the clarity of the instructions, on a five-point scale (1 = very less to 5 = very good). The percentage score is calculated as the total acquisition divided by the maximum score (50) and is interpreted using the standard eligibility criteria (81-100% = very feasible; 61-80% = feasible; 41-60% = moderately feasible; 21-40% = less feasible; 0-20% = not feasible); The results are presented in Table 2.

Both experts rated the instrument as very feasible (subject matter experts = 96%, linguists = 86%; average = 91%). Expert comments are used to revise the wording of items and remove items that are deemed less representative.

Table 2. Expert Assessment of Content Validity

Validator	Average score	Percentage	Categories
Material Expert	4,80	96%	Highly feasible
Linguist	4,30	86%	Highly feasible
Average	4,55	91%	Highly feasible

Data Analysis Techniques

The analysis was carried out with SPSS. The quality of the items was checked using a *corrected item-total correlation* between each item and the total score. In addition to the statistical significance ($p < 0.05$), which is easily achieved at $n = 104$, the magnitude and substantive meaning of each coefficient and the impact of the item deletion on reliability are also considered; Items with a *corrected item-total correlation* below about 0.20 and weak conceptual contributions are marked for deletion. Internal consistency was estimated with *Cronbach's alpha*, with an $\alpha \geq 0.60$ considered adequate for early-stage instruments (Azwar, 2012), and *mean inter-item correlation* was also reported. For the descriptive profile, the mean (M) and the standard deviation (SD) the total score was calculated, and the respondents were grouped using the normative scheme of $M \pm 1.5$ SD (Table 3).

Table 3. Academic Buoyancy Score Categorization Criteria

Score range	Categories
$X \geq M + 1.5$ SD	Very High
$M \leq X < M + 1.5$ SD	Height
$M - 1.5$ SD $\leq X < M$	Low
$X < M - 1.5$ SD	Very Low

RESULTS

Validity of Items

The initial twenty-five items were examined through item-total correlation. The coefficient ranges from 0.103 to 0.495. A total of 24 items showed a positive and statistically significant correlation ($p < 0.05$) so that they were maintained, with a coefficient between 0.262 and 0.495. One item, i3, had a low and insignificant coefficient ($r = 0.103$, $p = 0.296$) so it was deleted. A set of 24 preserved items is used throughout subsequent analyses. Results at the item level are presented in Table 4.

Table 4. Item-Total Correlation Results (25 items tested)

Item	Corrected item-total correlation	Sig. (p)	Remarks
i1	0,324	0,000	Valid
i2	0,319	0,000	Valid
i3	0,103	0,296	Invalid (deleted)
i4	0,349	0,000	Valid
i5	0,353	0,000	Valid
i6	0,276	0,000	Valid
i7	0,441	0,000	Valid
i8	0,262	0,000	Valid
i9	0,303	0,000	Valid
i10	0,382	0,000	Valid
i11	0,449	0,000	Valid

i12	0,495	0,000	Valid
i13	0,394	0,000	Valid
i14	0,405	0,000	Valid
i15	0,386	0,000	Valid
i16	0,470	0,000	Valid
i17	0,462	0,000	Valid
i18	0,478	0,000	Valid
i19	0,424	0,000	Valid
i20	0,435	0,000	Valid
i21	0,351	0,000	Valid
i22	0,399	0,000	Valid
i23	0,375	0,000	Valid
i24	0,322	0,000	Valid
i25	0,423	0,000	Valid

Internal Reliability

For the 25-point set, *Cronbach's alpha* was 0.736, which indicates adequate internal consistency for early-stage instruments (Azwar, 2012). After i3 is removed, the final 24-grain scale yields an alpha of 0.742 with a *mean inter-item correlation* of 0.386. Consistent with the preliminary scope of this study, such a level of reliability was interpreted as adequate for the use of the original study, not as evidence of strong and well-established psychometric qualities. The results are summarized in Table 5.

Table 5. Internal Reliability (Cronbach's Alpha)

Stages	Cronbach's alpha	Mean inter-item r	Number of Points
Initial group	0,736	0,375	25
Final batch (i3 deleted)	0,742	0,386	24

Initial Profile of Student Academic Buoyancy

The total score ranged from 52 to 100 ($M = 69.21$; $SD = 6.80$). The application of the $M \pm 1.5 SD$ resulted in a cut-off point of around 59 and 79, which corresponded to a score range of ≤ 58 (Very Low), 59-69 (Low), 70-79 (High), and ≥ 80 (Very High). The distribution of respondents between categories is presented in Table 6.

Table 6. Initial Profile of Student Academic Buoyancy (n = 104)

Categories	Score range	Frequency	Percentage (%)
Very High	$X \geq M + 1.5 SD$	3	2,88
Height	$M \leq X < M + 1.5 SD$	45	43,27
Low	$M - 1.5 SD \leq X < M$	53	50,96
Very Low	$X < M - 1.5 SD$	3	2,88
Quantity		104	100,00

Most students are in the Low (50.96%) and High (43.27%) categories, with the Low category being slightly larger, while the Very High (2.88%) and Very Low (2.88%) categories are small. This shows that there is a significant variation in students' ability to manage the demands of the final project.

DISCUSSION

This study developed an *academic buoyancy instrument* for final year students and conducted an initial psychometric evaluation. The instrument showed adequate early-stage characteristics: validity of the content judged to be very feasible by experts, item-total correlation that met the criteria on 24 of the 25 items, and acceptable internal consistency. These results suggest that *academic buoyancy* can be operationalized empirically in the academic and emotional context of a typical final project.

Most of the items met the criteria, which indicates that the 5C-based indicators, namely *confidence*, *coordination*, *control*, *composure*, and *commitment*, are relevant to the students' experience in the final project, in line with Martin and Marsh (2008) and Martin et al. (2010) and recent studies that treat *buoyancy* as a multidimensional construct (Collie et al., 2017; Gao, 2025). The elimination of a single weak item (i3) reflects the refinement prevalent in the early stages of development, when empirically-based item selection precedes more complex factor testing (Retnawati, 2016; Setiana et al., 2023).

An adequate alpha value indicates that the preserved grains tend to measure the same construct. In early-stage research, reliability above the minimum threshold can be accepted as an early indication of feasibility for dynamic and multidimensional constructs (Azwar, 2012; Bisschop, 2007), while further evidence of reliability and validity of the construct remains needed. The results of the profile, with variations concentrated in the High and Low categories, are in line with reports on the magnitude of student *buoyancy* variation in various contexts (Gao, 2025; Chen et al., 2025).

Students with *higher academic buoyancy* show adaptive traits such as confidence, planning, and emotional regulation under pressure, in line with the link between *buoyancy*, self-regulation, and engagement (Lu et al., 2025; Chen & Zhang, 2025). In contrast, students in the Low and Very Low categories are potentially more susceptible to procrastination, anxiety, and decreased motivation, echoing the findings of Dang and Middlemiss (2025) on *buoyancy* and fear of failure. The dimensions of *coordination* and *commitment* are in line with Chen and Zhang (2025) regarding *self-regulated learning*, and these findings open up opportunities for further studies of demographic and contextual moderators (Yau et al., 2025; Chen et al., 2025).

From a practical perspective, this instrument can ultimately help supervisors and guidance and counseling units in identifying students who need additional support. However, because this study is preliminary with one *convenience* sample without exploratory or confirmatory factor analysis, this study has several limitations. The sample is small and non-probability (*convenience*) and comes from a single university, thus limiting generalization. Demographic details are also limited; The final project completion stage is not collected systematically, thus limiting the depiction of sample characteristics. The analysis does not include the analysis of exploratory or confirmatory factors so the dimensional structure has not been tested; The validity of convergence, discriminatory, and criteria was also not checked, and the reliability of *the test-retest* was not assessed. The four-point

response format and the absence of measurement invariance testing also limit the conclusions. Follow-up research with a larger, more diverse, and probability-based sample, more complete demographic reporting, and a thorough program of factor and validity analysis are needed to strengthen the evidence.

CONCLUSIONS AND SUGGESTIONS

This study develops and conducts an initial psychometric evaluation of *academic buoyancy* instruments for final year students based on the 5C framework. Expert assessments supported content validity (91% average), item-total correlation analysis retained 24 of 25 items (i3 removed), and scales showed adequate internal consistency for early-stage measures. The initial profile shows a significant variation in the student's *academic buoyancy* during the final project phase.

Future research should test factor structure through exploratory and confirmatory factor analysis, examine the convergent, discriminatory, and *test-retest* validity and reliability, and replicate research with a larger and diverse sample across multiple institutions. Practically, after further validation, this instrument can assist study programs and guidance and counseling units in designing more targeted academic and psychological assistance; Until then, instruments should have been used for research purposes rather than for high-risk individual decisions.

REFERENCES

- Azwar, S. (2012). *Compilation of psychological scales* (Edition 2). Yogyakarta: Student Library.
- Barry, K. M., Woods, M., Warnecke, E., Stirling, C., & Martin, A. J. (2018). Psychological health of doctoral candidates: A systematic review. *Studies in Graduate and Postdoctoral Education*, 9(2), 189-212.
- Bisschop, J. (2007). Reliability methods and standards. *Microelectronics Reliability*, 47(9-11), 1330-1335.
- Chen, M., Liu, S., Wijaya, T. T., & Cao, Y. (2025). Influence of family socioeconomic status on academic buoyancy and adaptability: Mediating effect of parental involvement. *Acta psychologica*, 253, 104753.
- Chen, S., & Zhang, L.-F. (2025). Academic buoyancy and self-regulated learning among doctoral students: The mediating roles of creativity-generating research styles. *Thinking Skills and Creativity*, 58, 101900.
- Collie, R. J., Holliman, A. J., & Martin, A. J. (2017). Adaptability, engagement and academic achievement at university. *Educational Psychology*, 37(5), 632-647.
- Cornér, S., Löfström, E., & Pyhältö, K. (2017). The relationship between doctoral students' perceptions of supervision and burnout. *International Journal of Doctoral Studies*, 12, 91-106.
- Dang, A. H., & Middlemiss, W. (2025). Academic buoyancy and fear of failure differences among university students. *Social Sciences & Humanities Open*, 11, 101184.

- Gao, F. (2025). Academic buoyancy and achievement among EFL learners: The mediating roles of hope and enjoyment. *Acta Psychologica*, 260, 105595.
- Lu, Y., Li, F., Gao, C., Zhu, X., & Lian, L. (2025). Enhancing student satisfaction through academic buoyancy and flow experience. *Acta Psychologica*, 256, 104983.
- Martin, A. J., & Marsh, H. W. (2008). Academic buoyancy: Towards an understanding of students' everyday academic resilience. *Journal of School Psychology*, 46(1), 53-83.
- Martin, A. J., Colmar, S. H., Davey, L. A., & Marsh, H. W. (2010). Longitudinal modelling of academic buoyancy and motivation. *British Journal of Educational Psychology*, 80(3), 473-496.
- Martin, A. J., Ginns, P., Brackett, M. A., Malmberg, L. E., & Hall, J. (2013). Academic buoyancy and psychological risk: Exploring reciprocal relationships. *Learning and Individual Differences*, 27, 128-133.
- Namaziandost, E., & Çelik, B. (2025). Academic buoyancy, engagement, and achievement. *Frontiers in Psychology*, 16, 1357421.
- Peluso, D. L., Carleton, R. N., & Asmundson, G. J. (2011). Depression symptoms in Canadian psychology graduate students. *Canadian Journal of Behavioural Science*, 43(2), 119-127.
- Retnawati, H. (2016). *Quantitative analysis of research instruments*. Yogyakarta: Parama Publishing.
- Setiana, S., Taufik, A., Rusmana, N., & Nurihsan, J. (2023). Development and validation of student social adjustment instruments. *GUIDENA*, 13(4), 1089-1100.
- Sitompul, M. R. (2021). Reliability and validity of construct academic buoyancy in Indonesia. *Humanities*, 5(3), 389-397.
- Soysa, C. K., & Wilcomb, C. J. (2015). Mindfulness, self-compassion, self-efficacy, and gender as predictors of well-being. *Mindfulness*, 6(2), 217-226.
- Sverdlik, A., Hall, N. C., McAlpine, L., & Hubbard, K. (2018). The PhD experience: A review of the factors influencing doctoral students' completion, achievement, and well-being. *International Journal of Doctoral Studies*, 13, 361-388.
- Yau, O. K. T., Martin, A. J., Ginns, P., & Collie, R. J. (2025). Gender differences in academic buoyancy: A meta-analysis. *Learning and Individual Differences*, 121, 102700.