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Exploring Strategies to Enhance Psychology Students' Learning Motivation in Statistics Course: A Qualitative Study at Airlangga University

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Abstract

This study explored strategies to enhance learning motivation among psychology students in the Statistics course at Airlangga University. Many students initially perceived statistics as a difficult and irrelevant subject, often causing anxiety and disengagement. Using a qualitative case study approach, data were gathered from five students through semi-structured interviews and were analyzed thematically. The findings revealed five central themes: students' negative initial perceptions of statistics, the importance of connecting statistical concepts to real-world psychological practice, the role of peer and lecturer support in maintaining emotional engagement, the effectiveness of interactive and visual learning methods, and the use of personal strategies such as self-reflection and goal setting. These results underscore the importance of fostering autonomy, competence, and social relatedness in academic settings, suggesting that motivational challenges in complex courses such as Statistics can be addressed through humanistic and contextually relevant learning strategies.

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INTRODUCTION

Learning motivation is a crucial factor influencing students' academic success in higher education. Within this context, students are expected to engage in self-directed learning, effectively manage their time, set academic goals, and develop efficient learning strategies (Schunk, Meece, & Pintrich, 2014). However, not all students possess adequate learning motivation, particularly in courses that are perceived as challenging and complex.

One such course that often poses difficulties for Psychology students is Statistics, as it is perceived as unfriendly, intimidating, boring, and useless (Ulpah, 2009). This course plays a vital role in equipping students with essential data analysis skills necessary for psychological research. Nonetheless, many students view Statistics as difficult and irrelevant to psychological

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practice, and it often evokes anxiety and negative attitudes towards learning (Abbiati et al., 2021; Broers & Imbos, 2005). These perceptions contribute to low learning motivation and reduced student engagement in the classroom (Kaufmann et al., 2022).

According to Self-Determination Theory (Deci & Ryan, 1985; Ryan & Deci, 2000), one source of motivation originates from within the individual, known as intrinsic motivation. Intrinsic motivation arises from within the individual due to personal interest or the meaningfulness of the material. This theory emphasizes the importance of three basic psychological needs: autonomy, competence, and relatedness. When these needs are fulfilled, intrinsic motivation can develop optimally.

Furthermore, learning motivation is closely linked to self-efficacy, which is defined as an individual's belief in their capability to accomplish specific tasks (Bandura, 1997). Students with high self-efficacy tend to demonstrate greater persistence, employ more effective learning strategies, and show resilience in the face of academic challenges (Komarraju & Nadler, 2013).

In the context of learning statistics, research indicates that negative perceptions of the material's complexity, anxiety toward numbers and formulas, and a lack of perceived relevance to professional practice are primary obstacles to motivation (Onwuegbuzie & Wilson, 2003; Malik, 2015). Students from social science backgrounds, such as Psychology, often exhibit higher levels of statistical anxiety due to limited experience with mathematics and quantitative methods (Paechter et al., 2017).

Several approaches have been developed to overcome these challenges. Active learning, inquiry-based instruction, and gamification have been shown to increase student engagement and motivation (Buckley & Doyle, 2016; Perdana & Ramadhona, 2021). Contextualized teaching strategies that link statistical concepts to psychology case studies or practical applications also help students recognize the value of the material (Hsu, 2005; Vittengl & Vittengl, 2022).

Motivation theories also highlight the significance of expectancy-value theory (Wigfield & Eccles, 2000), which posits that motivation arises from two main factors: expectation of success and perceived value of the task. Students who doubt their ability to succeed in statistics and do not see its importance for their future tend to exhibit low motivation.

Based on this overview, an in-depth exploration of strategies to enhance Psychology students' motivation in Statistics courses is needed. A qualitative approach is appropriate for investigating students' experiences, perceptions, and expectations in a contextualized manner. This study aims to develop a deeper understanding of the dynamics of learning motivation and the strategies deemed effective by the students themselves.

METHOD

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This study employs a qualitative approach using an intrinsic case study design aimed at thoroughly exploring strategies to enhance students' learning motivation within the specific context of the Statistics course in the Psychology Department at Airlangga University. This design was chosen because of its focus on the contextual understanding of students' experiences, perceptions, and needs during the learning process (Creswell & Poth, 2018).

The participants in this study were active undergraduate psychology students at Airlangga University who had either completed or were currently enrolled in the Statistics course. Purposive sampling was utilized with the following criteria: 1) active students from the 2023–2025 cohorts, 2) those who completed or were taking the Statistics course at the time, and 3) willingness to participate in interviews and share their learning experiences. The number of participants was determined based on the principle of data saturation, whereby data collection ceased once no new information emerged (Guest, Bunce, & Johnson, 2006).

Data were collected through semi-structured interviews, supported by non-participant classroom observations (when feasible) and documentation review (such as syllabi, lecture materials, or student notes). The interviews focused on students' perceptions regarding their experiences learning statistics, motivational barriers, effective learning strategies, and expectations for instructional methods. The interview questions were developed based on Self-Determination Theory (Deci & Ryan, 1985) and Expectancy-Value Theory (Wigfield & Eccles, 2000).

Data analysis followed a thematic analysis approach as outlined by Braun and Clarke (2006), involving the steps of transcribing the interview data, thoroughly reading and familiarizing with the data, manually coding to identify meaningful patterns, grouping codes into main themes, revising and refining themes, and composing a thematic narrative aligned with the research focus. Data validity was enhanced through source triangulation, member checking, and researcher reflexivity to ensure a credible and meaningful interpretation.

This study was conducted in accordance with ethical research principles, including obtaining informed consent from each participant, ensuring confidentiality of identities and personal data, and respecting the participants' right to withdraw from the study at any time without any consequences.

RESULTS AND DISCUSSION

This study involved five Psychology students at Airlangga University who had completed the Statistics course. Through semi-structured interviews and thematic analysis, five main themes emerged, representing students' perceptions, experiences, and strategies for enhancing learning motivation in the Statistics course.

1. Negative Perceptions of Statistics as a "Number-Heavy" Course

All participants initially expressed negative impressions of statistics, perceiving it as a cognitive burden filled with numbers, formulas, and technical terms considered misaligned with their primary interest in psychology.

"...I felt statistics was not for Psychology students. It was full of numbers and formulas, so I was already intimidated before attending class." - Participant 1

"...Honestly, I panicked when I saw the syllabus. It felt like I was going to study Mathematics, not Psychology." - Participant 2

"...When I heard the word 'statistics,' I immediately recalled a bad experience in high school. So anxiety came first." - Participant 3

"...The material seemed complicated and impractical. It felt like learning something far removed from real Psychology." - Participant 4

"...I felt mentally unprepared. Even before the lectures began, I felt left behind." - Participant 5

All participants described having an initially negative perception of statistics, largely due to its association with mathematics, numbers, and complex formulas. This finding aligns with the concepts of statistics anxiety (Onwuegbuzie & Wilson, 2003) and math anxiety (Ashcraft, 2002), both of which explain that anxiety toward numerical information can reduce learning readiness and hinder cognitive processes such as conceptual understanding and problem-solving.

2. Need for Contextualization and Practical Relevance

Four out of five participants reported a shift toward a more positive perception when statistical material was linked to psychological practice, such as assessment, intervention evaluation, and quantitative research. This connection raised their awareness of the importance of statistics in professional development.

"...When the lecturer explained the relation of statistics to assessment or intervention evaluation, I began to understand its importance and felt more motivated." - Participant 4

"...My lecturer related the material to thesis writing, which helped me appreciate it more." - Participant 1

"...I only realized the importance of statistics when I started preparing my research proposal." - Participant 2

"...While doing a project that required SPSS, I began to see the usefulness of the material." - Participant 3

Four out of five participants demonstrated increased motivation when lecturers connected statistical material to psychological practice, such as assessment, intervention evaluation, thesis preparation, or the use of SPSS. This finding supports the Expectancy-Value

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Theory (Wigfield & Eccles, 2000), particularly the components of attainment value and utility value. When students perceive statistics as a skill relevant to their future careers and research activities, the perceived value of the task increases, thereby strengthening their learning motivation.

This finding is further reinforced by the Situated Learning Theory (Lave & Wenger, 1991), which emphasizes that learning becomes more meaningful when embedded within real-world contexts. When students understand how data analysis is applied in psychological practice, they no longer view statistics as an isolated course but as a professional competence.

3. Importance of Social Support and Emotional Connection

All participants emphasized the crucial role of social support from peers and lecturers in their learning. A supportive classroom atmosphere, opportunities to ask questions without fear, and study groups were key factors in maintaining students' motivation.

"...I felt not alone when studying with friends. Even when it was difficult, I kept going because I felt supported." — Participant 2

"...Our lecturer was very patient and open, which made me comfortable learning." - Participant 3

"...When I didn't understand, my friends helped explain. That was very emotionally helpful." - Participant 4

"...We encouraged each other and sometimes studied together while chatting. It made Statistics feel lighter." — Participant 1

"...Studying alone stressed me out, but with support from friends and lecturers, I felt more confident." - Participant 5

All participants emphasized that support from peers and lecturers plays a crucial role in enhancing their learning motivation. This aligns with Self-Determination Theory (Ryan & Deci, 2000), particularly the need for relatedness, where feeling safe to ask questions, discuss, and learn collaboratively helps students shift from external to more internalized motivation.

Moreover, Social Cognitive Theory (Bandura, 1997) explains that self-efficacy can be strengthened through verbal encouragement and observing peers'success. Chew and Dillon (2014) likewise found that peer support significantly reduces anxiety and enhances students' confidence in Statistics courses.

4. Effectiveness of Interactive and Visual Learning Methods

Four participants appreciated active and visual learning strategies such as data simulations, interactive graphs, SPSS use, and case studies, which enhanced conceptual understanding and engagement.

"Simulations with real data helped more than just formulas. I felt more capable." - Participant 3

"...I grasped the material better through graphs and data visualization." - Participant 2

"...Mini projects using real psychology data made me more enthusiastic." - Participant 5

"...Explanations with real examples were more effective than lengthy theory." - Participant 1

Four participants indicated that project-based instruction, data visualization, simulations, graphs, and case examples were more effective than theoretical explanations. This aligns with constructivist learning approaches, which emphasize the importance of hands-on experience and meaning-making through interaction with the material.

According to Paivio's Dual Coding Theory (1986), information presented through both verbal and visual channels is easier to understand and retain. Data visualizations and graphical representations support this principle by enhancing the comprehension of abstract concepts. Furthermore, Active Learning Theory (Prince, 2004) highlights that strategies such as mini-projects, the use of statistical software, and case-based discussions can strengthen student engagement and foster a stronger sense of competence in the subject.

5. Personal Strategies and Self-Reflection

All participants demonstrated personal initiative in overcoming learning difficulties, such as creating visual summaries, watching tutorial videos, setting daily goals, and rewriting lecturer explanations.

"...I made a personal study contract: master data distribution this week. It helped me focus and feel capable." - Participant 5

"...I like watching YouTube for alternative explanations. That really helps." - Participant 3

"...I created my own mind maps after class. It helped me remember longer." - Participant 1

"...I rewrote the lecturer's notes in my own words in my notebook to understand better." - Participant 4

"...After each class, I immediately evaluated which parts I understood and which I didn't." - Participant 2

These strategies reflected the importance of goal-setting, metacognitive approaches, and self-directed learning in sustaining motivation (Li & Nietfeld, 2007; Tahir et al., 2021).

The findings of this study indicated that Psychology students' learning motivation in the Statistics course was influenced by a combination of cognitive, affective, and social factors, as well as learning strategies. The results both confirm and extend existing understandings derived from motivation theories, particularly Self-Determination Theory (Deci & Ryan, 1985; Ryan & Deci, 2000) and Expectancy-Value Theory (Wigfield & Eccles, 2000).

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1. Negative Perceptions as Initial Learning Barriers

The finding that students formed negative perceptions even before the course began highlights that learning barriers often emerge long before formal instruction occurs. These perceptions may stem from prior academic struggles, stereotypes that statistics is inherently difficult, or social narratives from peers and seniors, all of which contribute to anticipatory anxiety. According to Bandura (1997), low self-efficacy shapes how individuals interpret academic challenges, often leading to avoidance tendencies, procrastination, and cognitive overload, even before the actual learning process begins. In this context, statistics anxiety acts as an "emotional filter" that suppresses cognitive readiness and limits students' ability to engage meaningfully with new materials.

Onwuegbuzie and Wilson (2003) emphasized that statistics anxiety includes not only fear of numbers or formulas but also a combination of cognitive, affective, and behavioral reactions that hinder learning engagement. Pekrun's Control-Value Theory further explains that negative achievement emotions, such as fear of failure or anxiety, undermine attentional resources, distort cognitive processing, and obstruct the development of intrinsic motivation. Thus, students' initial negative attitudes are not simply a matter of preference or disinterest but reflect a deeper interconnection of emotional dispositions, self-beliefs, and prior learning experiences that shape early cognitive readiness.

2. Practical Relevance as a Motivational Trigger

As students began to understand the importance of Statistics in psychological research and practice, their learning motivation increased, reflecting the process of value internalization described in Self-Determination Theory. Initially, students may approach Statistics merely as a mandatory course; however, recognizing its role in psychological assessment, intervention evaluation, evidence-based practice, and thesis development gradually shifts their motivation toward more internalized forms, such as identified regulation.

This finding aligns with Expectancy-Value Theory (Wigfield & Eccles, 2000), which posits that motivation is shaped by the subjective value assigned to tasks. By linking statistical content to real-world applications, students become more cognitively and affectively connected to the material, perceiving Statistics not as an abstract numerical subject but as an essential component of their emerging professional identity. This process is also consistent with the Situated Learning Theory (Lave & Wenger, 1991), which emphasizes that learning becomes more meaningful when embedded in authentic professional contexts. Consequently, recognizing the practical relevance of Statistics enhances both utility and attainment values, fostering deeper and more sustained engagement and supporting long-term motivational development.

3. Social Connection and Supportive Classroom Climate

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All participants emphasized the importance of social support from both lecturers and peers in building learning resilience, highlighting that learning is inherently social and emotional, rather than purely cognitive. This emphasis aligns with the relatedness component of Self-Determination Theory, which refers to the fundamental need for safe and supportive social connections (Ryan & Deci, 2000). When students experience positive interactions with lecturers, such as supportive attitudes, constructive feedback, and openness to questions, they feel safe to take academic risks, including asking questions, engaging in discussions, or admitting mistakes. Therefore, a supportive classroom atmosphere creates the psychological safety necessary for intrinsic motivation to develop and be sustained.

Reeve (2009) noted that autonomy-supportive teaching enhances student engagement, strengthens perceived competence, and reduces academic anxiety. Social Cognitive Theory further explains that observing peers successfully complete statistical tasks provides vicarious experiences that enhance self-efficacy. Collaborative activities, peer explanations, and study groups help reduce anxiety and increase confidence. Thus, a supportive classroom climate not only complements cognitive processes but also actively shapes students' emotional readiness and motivational capacity to engage with challenging material, forming a crucial foundation for long-term learning motivation.

4. Role of Interactive and Visual Teaching Strategies

Active, project-based, and contextual learning strategies such as real-data simulations, graphical presentations, and case studies effectively enhanced student engagement, supporting previous research that interactive teaching methods fulfill the need for competence and strengthen students' confidence in mastering statistical materials (Deci & Ryan, 1985). Students' preferences for simulations, SPSS practice, and data visualization further highlighted the importance of experiential and multimodal learning. According to the Dual Coding Theory (Paivio, 1986), integrating verbal explanations with visual representations creates stronger mental models, enabling a clearer understanding of abstract statistical concepts.

Through strategies such as data simulations, case studies, and problem-based projects, students could manipulate real or simulated datasets, fostering deeper comprehension and reinforcing their sense of capability. Active Learning Theory (Prince, 2004) also posits that active engagement promotes deeper cognitive processing and reduces misconceptions that commonly arise in passive learning environments. Prior research by Buckley and Doyle (2016) and Hsu (2005) demonstrated that interactive and visual approaches not only make learning more enjoyable and meaningful but also reduce statistics anxiety and increase student motivation. Thus, these teaching strategies are not merely engaging but are both theoretically

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grounded and empirically validated as effective methods for strengthening students' statistical competence and confidence.

5. Reflection and Self-Directed Learning Strategies

Findings related to learning reflection and personal study strategies revealed that students actively set goals and regulated their own learning to support academic success. This aligns with Li and Nietfeld's (2007) research, which emphasized that metacognitive awareness and specific goal-setting help students manage their learning strategies and evaluate their progress. These behaviors reflect the fulfillment of autonomy and the sense of control over one's learning process, as described in the Self-Determination Theory.

Students' use of goal setting, mind mapping, reviewing notes, and watching tutorial videos further demonstrates the central role of metacognition in sustaining learning motivation. According to Zimmerman's Self-Regulated Learning framework (2000), learners who engage in planning, monitoring, and evaluating their study processes are better able to regulate their effort and maintain motivation when facing challenging academic tasks. Such self-regulatory behaviors give students a stronger sense of ownership over their learning journeys, thereby reinforcing the autonomy component of SDT.

Li and Nietfeld (2007) also argue that metacognitive awareness strengthens academic resilience by helping students identify misunderstandings early and apply appropriate strategies. In this study, self-directed learning strategies, such as reviewing materials independently, using visual organizers, and seeking online explanations, served as protective mechanisms against anxiety, confusion, and cognitive overload. These strategies enable students to navigate complex statistical concepts, preserve their motivation, and continue progressing toward deeper learning despite initial difficulties.

CONCLUSION

This study aimed to explore strategies for enhancing learning motivation among psychology students at Airlangga University in the Statistics course through a qualitative case study approach. Based on interviews with five students and thematic analysis, five main themes emerged that represented the dynamics of their motivation. First, students tended to hold initial negative perceptions of Statistics, viewing it as a difficult, abstract, and irrelevant course for psychological practice. This generated academic anxiety and hindered their learning readiness. Second, the practical relevance of statistical material was crucial in fostering motivation. When students recognized that statistics is directly related to research, assessment, and psychological practice, their subjective value of the material increased, significantly boosting their motivation.

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Third, social support and a supportive classroom atmosphere were shown to be highly important factors. Positive relationships with lecturers and peers create a sense of safety and enhance emotional engagement in learning. Fourth, interactive and visual teaching strategies, such as data simulations, graphs, and case studies, improved students' understanding and self-efficacy, especially for those who previously felt less confident with numerical content. Fifth, independent and reflective learning strategies, such as goal-setting, creating visual notes, and self-evaluation, helped students develop autonomy and responsibility for their own learning process. Overall, this study confirms that students' motivation in challenging courses such as Statistics can be significantly enhanced through strategies that fulfill basic psychological needs: autonomy, competence, and relatedness. These findings reinforced the relevance of Self-Determination and Expectancy-Value theories as foundations for designing humanistic and contextualized learning in higher education.

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Author Contribution Statement

All authors contributed collaboratively to this study. The first author was primarily responsible for conceptualizing the study, data collection, data analysis, and drafting the manuscript. The second author supervised the research process and provided critical guidance through regular discussions, as well as substantial input in reviewing and refining the manuscript. All authors have read and approved the final version of the manuscript.

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