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Developing Strategies to Improve Students' Performance in The Module "Introduction to Classroom Research" At A University of Technology

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ABSTRACT
Introduction to Classroom Research (ICR) is a fundamental module that fourth-year Bachelor of Education (B-Ed) students must pass to obtain their teaching qualification. Over the last three years, the module recorded considerably poor student performance. This paper explores the reasons for students' poor performance in the module and further suggests improvements. Pedagogical Content Knowledge was used as the theoretical framework that underpinned this study. Twenty student teachers and four lecturers were purposefully selected as participants in this study at a university of technology. Semi-structured interviews were used to generate data from the participants. The study found that B-Ed students had a negative attitude towards this module and were challenged by the concepts they were introduced to for the first time at fourth-year level. Furthermore, this study found that lecturers do not use innovative teaching methods to enhance understanding or cater to diverse student needs regarding learning styles. The study's conclusions suggest that student teachers do not set high standards for themselves in this module and that lecturers do not use innovative teaching methods that inspire students. Based on these conclusions, it is recommended that innovative teaching methods be used to accommodate diverse student needs and that artificial intelligence tools be integrated to enhance student understanding and improve their performance. It is further recommended that concepts about this module be gradually introduced as early as the first year of study.

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INTRODUCTION

One of the most important modules that fourth-year Bachelor of Education (B-Ed) students must pass to obtain their teaching qualification is *Introduction to Classroom Research* (ICR). Over the last three years, one of the Universities of Technology (UoT) recorded alarmingly high failure rates in this module. Despite numerous departmental efforts to adjust teaching methodologies, student performance has remained stagnant. In 2023 alone, 766 students were enrolled in the module; only 660 qualified to write the final examination, and 262 students (40%) failed the module, while 103 required reassessment and 59 could not graduate because of this single course. This trend has raised critical questions about the module's design, instructional approaches, and

students' engagement with its content. The ICR module is pivotal because it lays the foundation for prospective teachers to develop the research and reflective skills essential for professional growth and lifelong learning.

The challenges in ICR mirror those observed in other difficult academic domains. Mazana, Montero, and Casmir (2020) reveal that only a few students succeed in Mathematics, with many perceiving it as overly difficult due to a lack of self-confidence and inadequate study strategies. Similarly, Sokkhey and Okazaki (2019) found that even with consistent attendance and independent study, most students continued to struggle in Mathematics. In broader STEM fields, Ting et al. (2022) observed that students often struggled to comprehend abstract concepts until active learning pedagogies and practical application methods were implemented, leading to improved outcomes. However, Mansour et al. (2024) noted a continued decline in STEM performance despite ongoing institutional efforts. Their findings emphasized the importance of intrinsic motivation and confidence in student success, suggesting that learners with a positive attitude toward STEM generally outperformed those who lacked interest. In contrast, Ndiku and Kaluyu (2020) criticized teacher-centered approaches in STEM education for promoting surface learning and recommended learner-centered instruction integrated with ICT.

While these studies are informative, they primarily focus on general subjects like Mathematics or STEM and not on education-specific research modules such as ICR. Few, if any, studies examine why student teachers at a UoT struggle with understanding research concepts and methodologies fundamental to classroom-based inquiries. The need for teachers to develop robust inquiry skills has long been recognized. According to Bidokht and Assareh (2011), the rapid growth of knowledge and technology requires educators to remain adaptive, making lifelong learning imperative. Dhaliwal (2015) describes lifelong learning as learning pursued across a lifetime, and Botes and Goede (2014) argue that aspiring lifelong learners require rigorous academic preparation to develop scholarly independence. The ICR module is designed to initiate this transformation by helping students become reflective practitioners and capable researchers in their future classrooms.

Taranto and Buchanan (2020) assert that today's self-directed, tech-savvy learners necessitate continuous teacher development to remain relevant and responsive. The COVID-19 pandemic further emphasized the urgency for educators to adapt to digital platforms (Atchoarena, 2021). Hursen and Gunduz (2014) emphasize that teachers must enhance their ability to source, analyze, and integrate scholarly materials into their practice. Vlasenko et al. (2020) reinforce this by asserting that teachers' roles extend beyond instruction and assessment to include action research addressing diverse learning needs. Tomlinson (2022) similarly supports differentiated teaching informed by teachers' understanding of learner diversity—insights that are best derived through classroom-based research.

The importance of equipping future teachers with research skills is underscored by South Africa's Education White Paper 6 (2011), which advocates for inclusive education and the ability of teachers to identify and respond to learning barriers. Masuku and Masuku (2023) echo this, affirming that all children—regardless of ability—are entitled to quality education. Jacobs and Govender (2020) add that inclusive education requires teaching to be adapted for diverse learner needs, necessitating targeted research and evidence-based approaches. In line with this, Korhonen et al. (2017) emphasize that the South African teacher education system aims to develop independent teachers with strong research and reflective competencies. Therefore, performance in ICR is not just academic—it represents a teacher's preparedness to investigate and resolve classroom challenges.

In light of 21st-century learning demands, Kahl (2010) and Munastiwi (2021) highlight equipping teachers with problem-solving and critical thinking skills. Yanuarto (2020) outlines classroom challenges such as lack of creativity, low self-esteem, and behavioral issues, each requiring targeted action research for resolution. As emphasized in MRTEQ (2018), newly qualified teachers must demonstrate effective classroom management skills across varied educational contexts. Tripathi (2022) underscores the role of action research in diagnosing and resolving behavioral and classroom management issues through iterative cycles of reflection

and implementation. Babadjanova (2020) characterizes teaching as a complex exercise requiring proactive discipline strategies informed by research and classroom dynamics.

Moreover, Ichsan et al. (2020) argue that education must equip teachers with skills to confront novel challenges. This includes assessing learners reliably and meaningfully—using Higher Order Thinking (HOT) strategies as outlined by Sagala and Andriani (2019), who categorize HOT into problem-solving, creative and critical thinking, and decision-making. Such pedagogical responsibilities demand that student teachers master the principles of classroom research to fulfill the expectations of a modern educational system. Despite abundant research on student performance in general education and STEM, little attention has been given to student teachers' specific challenges in modules like ICR. Most existing studies neither explore the dual perspective of students and lecturers nor focus on the UoT context, where the ICR module directly impacts graduation rates. This gap in empirical literature highlights the necessity of investigating stakeholders' experiences involved in ICR instruction and learning.

This study, therefore, seeks to examine the perceptions of both student teachers and lecturers to uncover the root causes behind the high failure rates in the ICR module at a UoT. Through qualitative inquiry, the study also aims to identify teaching strategies and institutional support mechanisms that could improve student performance and lecturer effectiveness. By focusing specifically on a critical but understudied module in teacher education, this research contributes new insights into curriculum and instructional reform in higher education. It also emphasizes the urgency of preparing future teachers to meet the demands of inclusive, diverse, and technology-driven classrooms and thrive as lifelong learners and reflective practitioners in their profession.

Research Aim and Questions

This study aims to investigate the underlying causes of poor student performance in the module *Introduction to Classroom Research (ICR)* by exploring the perceptions of both student teachers and lecturers. Through this exploration, the study also seeks to develop strategic recommendations to curb the high failure rate, improve student academic success, and enhance lecturer teaching practices in the module. To address this aim, the following open-ended research questions were posed for two participant groups:

Questions for student teachers:

1. Can you describe your attitude/approach/mindset towards the module ICR at the beginning of the year?
2. In your experience with this module, what aspects would you say were most challenging to understand?
3. How would you assess the teaching methods used by your lecturer in this module?
4. What changes or improvements would you suggest for this module to help students perform better?

Questions for lecturers:

1. What teaching strategies or methods have you employed in this module, and how do you believe they impact student understanding?
2. How well would you say students are engaging with the course content and other materials?
3. Do you use Artificial Intelligence tools in your lectures to enhance your students' understanding of the research process and concepts, and if so, how?

By addressing these questions, this research contributes to the knowledge on teacher preparation by identifying factors that hinder student success in foundational research modules and proposing actionable strategies to address these challenges in higher education settings.

METHODS

Research paradigm

Sprake and Palmer (2022) assert that the research paradigm comprises beliefs that guide action. The identified research problem stated in 1.1 above was the departure point to determine this study's paradigmatic framework and proposed research design and methodology. Žukauskas, Vveinhardt, and Andriukaitienė (2018)

assert that a paradigm is a particular set of logical reasoning that maps out and steers the process of conducting research and thus dictates the methods of collecting information or data. This study followed the interpretivist paradigm, which, according to Sprake and Palmer (2022), allows the researcher to become aware of, and describe or interpret meanings connected to human perceptions and experiences. Pervin and Mokhtar (2022) further opine that the interpretivist paradigm is characterized by the notion that people's opinions, perceptions, ideas, and ways of thinking can be understood by researching their daily experiences. The interpretivist paradigm was best suited for this study because I was interested in examining and understanding students' and lecturers' perceptions and experiences about students' poor performance in the module IER41ES. I relied on their ideas and thoughts around how the module was taught and what they thought lacked in the teaching.

Research design

A qualitative intrinsic case study research design was used to answer the research questions regarding students' poor performance. Hammarberg, Kirkman, and de Lacey (2016) assert that qualitative research methods are suitable and fitting when truthful and authentic information is required to answer the research question. Students, particularly those who failed the module ICR in the previous year, and lecturers who taught the module, were expected to provide authentic and truthful information about the students' poor performance. Suresh (2015) further reports that a case study involves thoroughly observing any social phenomenon, be it an individual, a process, a project, a family unit, an ethnic group, or an institution. A descriptive case study research approach, which, in the view of Priya (2021), provides an in-depth description of any occurrence, circumstance, situation, or reality, was adopted in this study. The social phenomenon investigated in this study was an in-depth examination and description of perceptions of student teachers and lecturers on the students' performance in the ICR module.

Sampling

A sample of twenty student teachers who failed the module the previous year and four lecturers who taught the module were selected to participate in this study. This was a purposive sampling as the participants were chosen by their information-rich status. According to Campbell, Greenwood, Prior, Shearer, Walkem, Young, Bywaters, and Walker (2020), purposive sampling is used when the researcher seeks to select participants rich with information in the phenomenon being investigated. Obilor (2023) further posits that purposive sampling is recommended in cases where the researcher needs an in-depth understanding of a particular phenomenon. The twenty students who previously failed the module and the four lecturers who taught the module were thus deemed the best-fitted participants to shed light on students' poor performance in the module ICR. This is because lecturers and students are directly involved in the teaching and learning the module in question.

Data collection

Data were collected using semi-structured open-ended interviews, which, according to Magaldi and Berler (2020), follow a set of pre-determined questions that are fixated on a particular topic to provide a broad structure. Furthermore, semi-structured open-ended interview questions make way for discovery and allow for the emergence of new questions as the discussion unfolds. An interview schedule comprising six key questions, three for students and three for lecturers, was formulated and used in this study. Adeoye-Olatunde and Olenik (2021) think that a semi-structured interview is beneficial because it allows the conversation to remain focused, but allows the researcher to explore relevant topics that may arise during the interview. Even though the interview questions in this study were pre-determined, I was still flexible enough to address other pertinent issues that arose during my conversations with the lecturers and students. Desmet, Brijs, Vanderdonck, Tops, Simoens, and Huys (2024) posit that open-ended questions are not generated with a set of possible answers that are designed to coerce the participants in a desired direction but allow them to express their own truthful and authentic views and perceptions. The students and lecturers who participated in this study could freely

express their genuine and uncoerced perceptions about the students' poor performance in the ICR module. I took notes during the interviews, and all the data I collected was anonymous.

Data analysis

Thematic analysis, which was used in this study according to Naeem, Ozuem, Howell, and Ranfagni (2023), comprises thick descriptions of data involving identifying emerging patterns within the data. As I went through the responses of students and lecturers in this study, I could identify some common keywords from which I interpreted meanings and then categorised the responses into themes. For example, responses from students who felt that the lecturers' teaching methods were not accommodating to their learning styles and needs were clustered together for reporting purposes, and the reactions from lecturers who thought they were not equipped enough to integrate AI in their teaching were also clustered together and reported as such.

Ethical considerations

"Anonymity is an important ethical procedure, and every researcher is expected to ensure that his or her research participants are protected" (Moosa, 2013). The lecturers and students who participated in this study were guaranteed confidentiality and anonymity. Hoft (2021) asserts that confidentiality and anonymity refer to protecting the participants' privacy. The participants' responses or information they provide may not be linked to them as their identities may never be revealed anywhere in the study, and this guarantee allowed for honesty and the provision of accurate information on their part. For this reason, the students and lecturers who participated in this study freely and fully committed to providing honest and accurate information about their views and perceptions about the poor performance of students in module ICR. Furthermore, the aim of this study and how it would be disseminated were openly disclosed to the students and lecturers (participants). The participants thus granted their informed consent to participate in the study. Klykken (2022) describes informed consent as a research practice in which prospective participants in a study are provided with a thorough explanation of the purpose of the study, possible risks and benefits, and where and how the researcher plans to use the collected data. It was explained to the lecturers that the primary aim of this study was to explore measures to improve students' performance in the ICR module, and that there were no risks or potential dangers for them due to participating in this study.

RESULTS AND DISCUSSION

Result

This study sought to investigate the perceptions of student teachers and lecturers regarding student teachers' poor performance in the module Introduction to Classroom Research, aiming to suggest or recommend strategies to improve this situation.

Student teachers' mindset/attitude and approach towards ICR (Q1)

One of the key areas explored in this study was how student teachers approached the *Introduction to Classroom Research (ICR)* module at the beginning of the academic year. Their mindset and initial expectations offer valuable insight into the emotional and cognitive barriers that might affect their learning trajectory. Interviews revealed a strong sense of fear, anxiety, and a minimum-target mentality, with many students approaching the module with the sole aim of passing with the bare minimum of 50%. This finding suggests that emotional readiness and preconceived narratives about the module significantly shape students' engagement levels from the outset.

Table 1. Student Teachers' Perceptions and Attitudes toward ICR at the Beginning of the Year

Emerging Sub-theme	Description	Illustrative Quotations

Fear and Anxiety	Students expressed stress or dread about the module before or early in the semester.	*"I was so nervous about this module because I already knew a few students were repeating it." "This got me quite anxious about this module."*
Negative Peer Influence	Perceptions were shaped by stories from friends or older students who struggled with the module.	*"My friend told me about this lady who repeated the module three times."*
Discouraging Messaging from Lecturers	Lecturers' early warnings about difficulty reinforced fear and uncertainty.	*"During orientation... the lecturer told us that ICR was complicated… I was so worried…"*
Minimal Target Setting (Pass)	Many students adopted a mindset aimed only at the pass mark.	*"My approach was to fight to get just 50 percent and put this thing behind me."*
Determined Compliance	A few students adopted a responsible approach and planned to attend classes and try their best.	*"I decided to attend classes and do my best to pass because I want to graduate in record time."*

The table above reveals the emotional burden that accompanies the ICR module for many student teachers. A prevailing theme was fear and anxiety, often fueled by negative peer influence and discouraging framing by lecturers during orientation. These psychosocial factors appear to shape an anticipatory avoidance behavior, lowering the standards students set for themselves. The widespread tendency to aim merely for the 50% pass mark indicates a performance orientation rather than a learning orientation, which undermines deep engagement and intellectual curiosity. While a few students demonstrated intrinsic motivation and a desire to perform well, their voices were in the minority. These findings suggest that students will likely continue approaching ICR with trepidation without early reframing of the module's value and support systems to normalize research learning curves. The data underscore the importance of redefining the narrative around ICR in peer culture and lecturer messaging to shift students' psychological disposition from avoidance to active engagement.

Regarding the most challenging aspects to understand (Q2)

Student teachers were asked to reflect on the most challenging components of the ICR module. Their responses revealed persistent conceptual difficulties across foundational aspects of educational research. The most notable areas of struggle included understanding academic writing conventions, differentiating between everyday and scholarly meanings of key terms, and developing components such as problem statements, theoretical frameworks, and data analysis procedures. These challenges were further exacerbated by late introducing research concepts within their academic journey.

Table 2. Student Teachers' Conceptual Challenges in the ICR Module

Emerging Sub-theme	Description	Illustrative Quotations
Misunderstanding of Problem Statement	Difficulty in formulating precise research problem statements.	*"It took me a while to fully understand the meaning of a 'problem statement'…" "I thought I just had to mention the problem…"*
Confusion Over Theoretical Frameworks and Paradigms	Students struggled to grasp abstract concepts central to educational research.	*"I still do not fully grasp the concept of 'theoretical framework,' let alone the 'paradigm.'"*
Lack of Clarity on Research Action	Students are unsure how to conceptualize or implement 'action' within the research process.	*"I cannot confidently say that I understand what it is to take action, in the research process."*

Difficulty in Data Analysis	Limited comprehension of how to analyse qualitative or quantitative data.	*"For me, data analysis was quite complex to understand."*
Underdeveloped Academic Writing Skills	I'm having trouble transitioning from general essay writing to structured scientific writing.	*"I found writing a comprehensive introduction and background very difficult."*
Late Exposure to Research Concepts	Students indicated these complex ideas should have been taught earlier in their degree.	*"It would have helped if some concepts in this module were introduced to us from first or even third year level…"*

The data in Table 2 reveal that student teachers encountered cognitive dissonance when asked to engage with academic concepts that appeared familiar in everyday language but were more abstract and technical in academic usage. This includes *problem statement*, *theoretical framework*, and *paradigm*—core pillars in research methodology that demand abstract thinking and disciplinary literacy. A critical point emerging from the findings is the epistemological gap between generalist writing habits and the demands of scientific inquiry. Students accustomed to narrative or expository essay formats struggled with structured, evidence-based writing, such as formulating coherent backgrounds, constructing arguments, and aligning problem statements with research aims. Furthermore, the timing of research instruction appears to contribute to students' confusion significantly. Several participants explicitly stated that earlier exposure to basic research terminology in prior years would have lessened the conceptual overload experienced in their final year. This underscores the need for spiral curriculum design, in which research concepts are introduced progressively and increasingly complex over the academic program. These findings highlight a mismatch between students' academic preparedness and the ICR module's complexity, calling for reconsideration of how, when, and to what depth research concepts are introduced across the teacher education curriculum.

Student teachers on lecturers' teaching methods and how they felt about the teaching methods (Q3)

To gain insight into the effectiveness of instructional practices in the *Introduction to Classroom Research (ICR)* module, student teachers were asked to describe the methods employed by their lecturers and how they impacted their learning experience. Universally, participants identified slide-show presentations and the question-and-answer format as the primary teaching approach. However, the perceptions associated with this approach were overwhelmingly negative, with students describing their learning environment as repetitive, monotonous, and disengaging.

Table 3. Student Teachers' Perceptions of Lecturers' Teaching Methods in ICR

Emerging Sub-theme	Description	Illustrative Quotations
Overreliance on Slide Presentations	Lecturers consistently used PowerPoint slides to deliver content.	"Without fail, my lecturer used slide presentations to explain new concepts..."
Monotony and Lack of Variety	Instructional delivery lacked creativity or variation.	"I felt that lack of variety was not working for me." "She repetitively explained content from her slides…"
Disengagement and Loss of Motivation	Students reported diminished interest and excitement toward the module.	"I lost the excitement and drive to attend class…"
Passive Learning Environment	Learners felt they had limited opportunities to engage actively.	"All I get to do is listen, make some notes, and ask questions…"

Negative Emotional Reactions	Teaching style evoked boredom and disinterest.	"I stopped attending classes because I felt unstimulated." "It became quite monotonous and boring."

As illustrated in Table 3, the student responses point to a significant misalignment between instructional practices and learner engagement needs. The lecturers' overreliance on slide presentations and minimal variation in pedagogy fostered a passive learning environment that failed to stimulate intellectual curiosity or sustain motivation. The language students use—*boring*, *unstimulating*, *monotonous*—strongly indicates that the current teaching practices may not be suitable for fostering deep engagement with complex research concepts. Students expressed a desire for more interactive, learner-centered teaching, suggesting that the content delivery methods did not align with their preferred learning styles, particularly for a research-intensive subject. This aligns with existing research on active learning, emphasizing that students learn more effectively when actively constructing knowledge rather than passively receiving it. The theme of disengagement due to predictability is also worth noting. When students anticipate the same routine in every class session, their intrinsic motivation deteriorates, sometimes leading to non-attendance. Given that the ICR module demands conceptual rigor and applied thinking, the lack of experiential learning opportunities, such as project-based tasks, peer collaboration, or simulated research exercises, represents a critical instructional gap. These findings call for an instructional redesign incorporating pedagogical diversity, participatory learning, and the strategic use of technology, including AI tools, to make complex content more accessible and engaging.

Students suggested changes and improvements (Q4)

When invited to share their views on how the Introduction to Classroom Research (ICR) module could be improved, student teachers offered constructive and forward-thinking suggestions that reflected their pedagogical needs and personal strategies for success. Their responses clustered around three core recommendations: (1) the need for diverse and interactive teaching methods, (2) promotion of learner agency and mindset shift, and (3) integration of digital tools such as AI to aid conceptual understanding.

Table 4. Student Teachers' Recommendations for Improving ICR

Emerging Sub-theme	Description	Illustrative Quotations
Diversification of Teaching Strategies	Strong appeal for varied, interactive, and student-centered pedagogy.	*"I would strongly suggest that lecturers diversify their teaching methods…"* *"I don't learn much when I am not actively involved…"*
Cultivating a Positive Attitude and Responsibility	Students emphasized mindset, effort, and taking ownership of learning.	*"I would encourage students to have a more positive attitude…"* *"Go the extra mile and not rely solely on lecturers."*
Use of Guest Lecturers and Alternative Voices	Desire for fresh perspectives and broader exposure.	*"Maybe lecturers should think of inviting guest lecturers at times…"*
Leveraging Artificial Intelligence Tools	Recognition of AI tools (e.g., ChatGPT) as aids for comprehension and self-study.	*"Lecturers could help students explore AI tools…"* *"I would encourage students to use ChatGPT…"*

The suggestions from student teachers, as presented in Table 4, underscore a progressive learning disposition and a clear awareness of the structural and individual factors contributing to poor performance in ICR. The call for diverse and engaging teaching strategies reveals a dissatisfaction with traditional didactic

methods. It aligns with research that advocates for active learning environments to foster a more profound understanding of abstract and complex material. Notably, students acknowledged their role in the learning process, suggesting that success in the module also depends on self-motivation and initiative. This perspective reflects an emergent understanding of learner autonomy, a critical attribute for lifelong learners, particularly in professional fields like education. Another important insight was the student-driven endorsement of AI tools, particularly ChatGPT, to enhance their understanding of research concepts. This marks a shift in learner behavior and preference, demonstrating how students increasingly seek on-demand, personalized support to complement traditional instruction. Their recommendation that lecturers assist in guiding the responsible use of such tools indicates a desire for structured digital literacy integration within the curriculum. In sum, these recommendations suggest that improving ICR outcomes will require a multidimensional approach—pedagogical innovation, mindset transformation, and strategic incorporation of technology—to create a learning environment that is relevant, inclusive, and empowering for student teachers.

Lecturers on the teaching methods they use (Q1)

To understand the pedagogical approaches adopted in the *Introduction to Classroom Research (ICR)* module, lecturers were asked to describe their methods and the rationale behind their choices. The responses revealed a consistent preference for traditional delivery formats, primarily centered on PowerPoint slide presentations and question-and-answer (Q&A) sessions, with some efforts made to encourage group discussions and self-study. However, the responses also uncovered challenges in sustaining student engagement and a lack of instructional diversity, which may contribute to teachers' poor performance and attendance patterns.

Table 5. Teaching Methods Employed by ICR Lecturers

Emerging Sub-theme	Description	Illustrative Quotations
Use of Slide Presentations as Primary Tool	PowerPoint slides dominate content delivery in the module.	*"I use PowerPoint slides to introduce and explain the content…"* *"I use my slides and make time for Q&A…"*
Minimal Interactivity with Q&A Format	Question-and-answer sessions supplement lectures but remain limited in scope.	*"I mostly use the question-and-answer method through slide presentations…"*
Decline in Engagement with Alternative Methods	Attempts to diversify were met with poor student reception.	*"Students did not like that method… they did not like to read the slides to each other."*
Encouragement of Self-Directed Study	Lecturers promote consultation of textbooks and open-door support.	*"I ask my students to consult the textbook or readers to expand on what we cover…"* *"My door is always open…"*
Supplementary Class Activities	Occasional classwork is used to assess comprehension post-unit.	*"I try to keep things interesting by giving them classwork after we have completed a unit…"*

As reflected in Table 5, lecturers' instructional choices for teaching ICR lean heavily toward didactic teaching styles, with PowerPoint presentations as the primary delivery mode. While this approach may facilitate content coverage, especially in a concept-heavy and theoretical module, it appears to fall short in engaging learners meaningfully, particularly those who prefer active and experiential learning. Integrating Q&A segments and class discussions indicates an intent to incorporate interactivity. However, lecturers acknowledged that student participation remains limited, suggesting a disconnect between the mode of delivery and learner motivation. Notably, one lecturer attempted a peer-led reading strategy to increase student involvement. This

effort, however, was quickly abandoned due to a sharp decline in attendance, highlighting resistance to non-traditional formats when not properly scaffolded or incentivized. Self-directed reading assignments and office consultations reflect a belief in student autonomy and support, but they also suggest that structured in-class engagement opportunities are insufficient. Additionally, efforts to include classroom activities for feedback loops were inconsistently applied, and even when they occurred, the impact on long-term engagement remained unclear due to declining attendance. These insights indicate the need for a more structured blend of traditional and active learning strategies. Techniques such as problem-based learning, flipped classrooms, or blended approaches with technology integration may be more effective in bridging the current gap between teaching efforts and learning outcomes. More importantly, understanding the motivational dynamics of students is crucial in reshaping these pedagogical practices toward achieving better engagement and performance in ICR.

Lecturers assess how well students engage with the course content and other materials (Q2)

To gain insight into how student teachers interact with the course materials in Introduction to Classroom Research (ICR), lecturers were asked to assess the extent of students' engagement both during and outside of lectures. The responses revealed a consistent concern among lecturers regarding superficial engagement, with most students failing to interact deeply with the learning content. Although a small group of students were consistently described as engaged and proactive, most were characterized by passivity, minimal participation, and lack of independent academic effort.

Table 6. Lecturers' Observations on Student Engagement with ICR Content

Emerging Sub-theme	Description	Illustrative Quotations
Low Overall Engagement	Most students are not actively involved or interacting with the course content.	*"One can safely conclude that they do not engage enough with the content…"* *"Most of them are not eager to interact."*
Presence of a Small Active Group	A few students consistently participate and engage with the material.	*"There is always that handful of students who will answer and ask questions in class…"*
Classroom Interaction as a Proxy	Engagement is primarily judged through participation during lectures.	*"You will see those who engage with the content by their interaction and involvement during lectures…"*
Limited Insight into Out-of-Class Activity	Lecturers rely on in-class behavior and test performance to infer outside engagement.	*"It is not easy to tell if they do so in their own time, but judging from their performance…"*

Table 6 shows that lecturers largely perceive student engagement with ICR content as insufficient, both in the classroom and private study. The absence of widespread enthusiasm or intellectual curiosity among student teachers poses a serious concern for a module that requires critical thinking, independent reading, and reflection, such as ICR. A recurring theme is that only a small group of students—referred to as "usual suspects" by one lecturer—display meaningful engagement, consistently asking questions and participating in class discussions. These students were perceived as actively involved with the course content beyond lectures. However, their limited number suggests that most students do not exhibit similar levels of academic initiative. Furthermore, lecturers primarily base their evaluations on observable classroom behaviors and assessment performance, which may not capture the full extent of student effort. Nevertheless, the correlation between passive classroom behavior and poor test results reinforces the conclusion that students are under-engaging with the material. The lack of sufficient engagement can be attributed to several interconnected factors: uninspiring teaching methods, student anxiety or disinterest, and possibly a lack of foundational understanding

of research concepts, as highlighted in earlier themes. These findings suggest that content delivery and assessment structures may need re-evaluation to encourage deeper engagement, including strategies like interactive learning tasks, collaborative projects, or integrated digital tools to stimulate autonomous exploration.

Lecturers on whether they integrate artificial intelligence (AI) to enhance their teaching and bolster students' understanding of the research process. (Q3)

To explore the extent to which lecturers leverage technological advancements in the teaching of *Introduction to Classroom Research (ICR)*, they were asked whether they had incorporated artificial intelligence (AI) tools—particularly platforms like ChatGPT—into their instructional strategies. The responses revealed minimal usage, with only one lecturer reporting occasional application. Most lecturers expressed uncertainty, lack of familiarity, or skepticism toward the pedagogical use of AI tools in this context.

Table 7. Lecturers' Use and Perceptions of AI Integration in ICR Teaching

Emerging Sub-theme	Description	Illustrative Quotations
Occasional AI Use by One Lecturer	A single lecturer has tested ChatGPT to simplify explanations of research concepts.	*"I occasionally consult ChatGPT to get different interpretations and simpler explanations…"*
Lack of Knowledge or Confidence	Several lecturers said they did not know how to integrate AI tools effectively.	*"I am not even sure how I would do that. I guess I still need to be equipped in that department."*
Skepticism and Concerns about Misuse	Some lecturers believe AI tools promote plagiarism or unauthentic student work.	*"I knew that the work was not their own… For this reason, I do not even entertain the use of ChatGPT."*
Absence of Formal Training	A lack of institutional or professional development support hinders AI integration.	*"I have not used any AI tool… I am still trying to figure out how to integrate ChatGPT, for example."*

Table 7 reflects that AI integration in ICR teaching is nascent, with only one out of four lecturers having tentatively used ChatGPT to enrich their explanations of complex research concepts. This limited use points to a promising yet underutilized avenue for enhancing student comprehension in a conceptually dense module such as ICR. A significant barrier identified is a lack of digital pedagogical preparedness. Most lecturers acknowledged unfamiliarity with AI tools, expressing hesitation or needing professional development before implementation. This highlights a skills gap that could be addressed through targeted institutional support and training workshops focused on AI literacy for educators. Additionally, one lecturer raised ethical concerns, particularly about academic integrity and students' misuse of generative AI. Their skepticism stemmed from detecting what they believed to be AI-generated content in student proposals. This signals the need for clear policy guidelines on ethical AI use and student training on academic honesty when utilizing such tools. These findings suggest that while AI presents opportunities for enhancing concept delivery and individual support, its effective deployment requires institutional support, structured capacity building, and pedagogical reorientation. Equipping lecturers with the technical skills and ethical frameworks to utilize AI meaningfully will be critical in advancing teaching quality and student learning outcomes in research-based modules.

Discussion of results

The findings of this study reveal a multifaceted landscape of perceptions and challenges encountered by both student teachers and lecturers in the Introduction to Classroom Research (ICR) module. A prominent theme that emerged is the emotional and psychological disposition that shapes students' initial engagement. Numerous studies have highlighted the critical role of academic emotions—such as anxiety, boredom, and curiosity—in influencing motivation, engagement, and learning outcomes, especially in cognitively demanding

modules (Dietrich et al., 2022; Pekrun & Linnenbrink-Garcia, 2012; Tan et al., 2021). Many student teachers entered the ICR module apprehensive, shaped by negative peer narratives and reinforced by lecturers' warnings during orientation. These emotions reflect affective components that influence students' self-regulation, academic orientation, and persistence (Zaky, 2019; Wu et al., 2019). The result is a dominant "performance" rather than "mastery" mindset, where students aim to merely pass the module instead of engaging meaningfully with its content. This fixed mindset is reminiscent of the Pygmalion effect and stereotype threat phenomena in higher education (Cassidy et al., 2021; Hjertø et al., 2014), where expectations and social narratives significantly influence academic behavior and achievement.

Beyond affective factors, cognitive challenges further compound the student learning experience. Many reported struggles with research-specific terminology, academic writing, and abstract theoretical constructs—such as paradigms and frameworks—signifying a mismatch between prior academic preparation and the demands of the ICR module. Van Merriënboer and De Bruin (2013) argue that when introduced without adequate scaffolding, abstract concepts can create high cognitive loads that hinder comprehension. This issue is not isolated. Krause (2001) documented similar student disorientation during narrative-based to evidence-based academic writing transitions. The timing of the ICR module—offered late in the program—exacerbates these challenges, introducing advanced research content before students have developed the necessary academic literacies (Hashim, 2021).

This misalignment speaks to a broader structural issue within the teacher education curriculum. Bannister-Tyrrell et al. (2018) emphasized the lack of systematically embedded research components across initial teacher education programs, leaving students unprepared for research-intensive modules. A more effective model would adopt vertical curriculum alignment, where research competencies are developed progressively over time (Han, 2021; Thake, 2025). Such an approach ensures conceptual continuity and cumulative skill development, fostering students' readiness to engage with research at deeper levels.

From a pedagogical standpoint, student and lecturer narratives indicate an urgent need for instructional reform. Predominantly lecture-based methods and passive Q&A formats have contributed to disengagement, mirroring Busa and Chung's (2024) findings that teacher-centered pedagogies can suppress active participation in higher education. Students described classes as monotonous, echoing Niederhauser et al.'s (1999) concerns that passive content delivery undermines higher-order thinking and engagement. Though some lecturers encouraged dialogue and maintained open-door policies, students reported persistent disengagement, suggesting that such strategies may be inconsistently implemented (Olafson & Quinn, 2003).

Alternative instructional methods—such as case studies, inquiry-based projects, and collaborative research simulations—may better serve the objectives of the ICR module. Hepner and Carlson (2018) found that active learning significantly enhances research competence, while Grabinger and Dunlap (2002) highlighted problem-based learning as a key driver of critical thinking. Garrison, Anderson, and Archer (1999) further contend that critical inquiry within learning communities promotes deeper comprehension, especially in abstract academic domains. As such, instructional redesign should aim to cultivate curiosity, inquiry, and knowledge construction—principles essential for navigating the conceptual rigor of research (Gildersleeve et al., 2010).

Another crucial insight pertains to the divergence between teaching intentions and student reception. Lecturers reported using examples and classwork to improve accessibility, yet low attendance and disengagement often undermined these efforts. This mismatch reflects the classic misalignment between teaching and learning styles, as Ford and Chen (2001) observed. Even in rural learning ecologies, similar mismatches have been shown to negatively impact student outcomes (Letele, Alexander, & Swanepoel, 2013). Sagy, Hod, and Kali (2019) argue that mismatches may stem from conceptual differences in assumptions about teaching itself, not just instructional strategies.

Furthermore, lecturers encouraged self-directed learning, yet many students lacked the confidence or metacognitive tools to navigate this independently. Balwant (2018) emphasizes that disengagement is not merely a behavioral deficit but a multifaceted response to pedagogical incongruence. Lawson and Lawson (2020) further frame disengagement as a systemic issue, requiring holistic solutions rather than piecemeal interventions. Promoting autonomy is insufficient without equipping students with strategies to read critically, construct arguments, and manage complex tasks.

To address this, pedagogical alignment must be prioritized. Cowan, George, and Pinheiro-Torres (2004) argue for synergy between curriculum, instruction, and assessment practices. Tang (2023) advocates for student-centered approaches that move beyond tokenism by incorporating scaffolding, feedback, and structured autonomy. Sherwani and Singh (2015) remind us that students' perceptions of teaching quality directly shape their engagement and performance, underlining the necessity of responsive, adaptive pedagogy.

A particularly noteworthy development emerging from the data is the increasing recognition of artificial intelligence (AI) tools—especially ChatGPT—among students and a minority of lecturers. Students highlighted AI's potential in clarifying abstract research concepts and viewed these tools as supplementary aids (Burkhard, 2022; Kumar & Raman, 2022). These findings align with research that AI can personalize learning and support self-directed study in higher education (Dempere et al., 2023; Rasul et al., 2023). However, most lecturers remained skeptical, expressing concerns over academic dishonesty and overreliance on generative tools (Balalle & Pannilage, 2025; Mutanga et al., 2024). This apprehension reflects broader institutional tensions regarding digital competence and academic integrity (Shakib Kotamjani et al., 2023; Vargas-Murillo et al., 2023).

Despite these concerns, a few lecturers acknowledged the pedagogical potential of ChatGPT in deepening understanding and improving conceptual delivery. Airaj (2024) emphasizes the importance of using AI ethically and strategically, especially for abstract and theoretical learning. Kirkwood and Price (2014) caution that the true benefit of technology-enhanced learning depends on how well the tools are integrated into pedagogical frameworks. Kayal (2024) argues that meaningful AI integration requires a transformative framework rooted in ethical guidance, digital literacy, and educational purpose.

Institutions must develop policies and training programs to guide ethical and pedagogically informed AI use. Without such infrastructure, the risk of misuse or underutilization remains high. Spante et al. (2018) and Kayal (2024) call for comprehensive capacity-building efforts that empower educators and students alike to leverage AI effectively and responsibly. In summary, the findings suggest that underperformance in the ICR module is not solely a reflection of student deficiencies but a result of interlocking emotional, cognitive, pedagogical, and structural factors. Addressing these challenges requires a systemic, multidimensional strategy that cultivates positive academic mindsets, redesigns curriculum trajectories, diversifies teaching approaches, and meaningfully incorporates digital tools like AI. Such a holistic transformation promises to produce future educators who are proficient in educational research and reflective, confident, and critically engaged in their professional learning.

This study is not without limitations. First, the sample was restricted to a single university and one module (ICR), limiting the generalizability of the findings across disciplines and institutional contexts. Second, while student and lecturer perceptions were explored qualitatively, the study did not examine actual learning outcomes or performance metrics associated with AI use. Future research could adopt a mixed-methods design to measure the impact of AI tools on student learning gains in modules requiring abstract reasoning or research literacy. Longitudinal studies could also assess how lecturers' attitudes toward AI evolve with increased exposure and training. Furthermore, comparative studies across faculties and institutions may offer a more nuanced understanding of the enablers and barriers to AI integration in higher education.

CONCLUSION

This study investigated the persistent issue of poor student performance in the "Introduction to Classroom Research" (ICR) module at a University of Technology, drawing on the perceptions of both student teachers and lecturers. The findings indicate that the underperformance in this foundational module is shaped by an interplay of emotional, cognitive, pedagogical, and institutional factors. Students' initial engagement was often hindered by anxiety, low expectations, and negative peer influence, creating a performance-oriented rather than learning-oriented mindset. Conceptual difficulties further compounded the challenge, especially due to the late introduction of abstract research concepts and the lack of prior academic scaffolding. Additionally, the didactic and monotonous teaching approaches employed by most lecturers failed to meet the diverse learning needs of students, contributing to low motivation and disengagement. While students expressed willingness to take responsibility for their learning, they also articulated a clear need for more interactive, varied, and technologically integrated instructional strategies. However, the study revealed that most lecturers lacked confidence or training in integrating innovative digital tools, such as artificial intelligence (AI), into their pedagogy. This digital and pedagogical gap limits the potential for enhancing conceptual understanding in research-based modules. Theoretically, this study extends the understanding of how affective dispositions, curriculum design, and instructional methods converge to influence research literacy in teacher education. Empirically, it highlights the pressing need for curricular reform that progressively builds research competencies throughout the degree program. Pedagogically, it urges a shift from passive, lecture-based instruction to dynamic, learner-centered, and digitally enriched learning environments. Nevertheless, this study is limited by its narrow institutional scope and reliance on qualitative perceptions without measuring actual performance outcomes post-intervention. Future studies should incorporate mixed-method approaches to assess the effectiveness of AI-enhanced and diversified instructional strategies across multiple institutions and disciplines. Longitudinal designs would also be beneficial in tracking the development of research competencies from early exposure to final-year modules.

REFERENCES

Acee, T. W., Hoff, M. A., Flaggs, D. A., & Sylvester, B. (2023). Time perspective and grade expectations as predictors of student achievement and retention in the first year of community college. *Journal of College Student Retention: Research, Theory & Practice, 24*(4), 924–946. https://doi.org/10.1177/1521025120960676

Adeoye-Olatunde, O. A., & Olenik, N. L. (2021). Research and scholarly methods: Semi-structured interviews. *Journal of the American College of Clinical Pharmacy, 4*(10), 1358–1367. https://doi.org/10.1002/jac5.1441

Airaj, M. (2024). Ethical artificial intelligence for teaching-learning in higher education. *Education and Information Technologies*, *29*(13), 17145-17167. https://doi.org/10.1007/s10639-024-12545-x

Atchoarena, D. (2021). Universities as lifelong learning institutions: A new frontier for higher education? In *The promise of higher education: Essays in honour of 70 years of IAU* (pp. 311–319). https://library.oapen.org/bitstream/handle/20.500.12657/50705/978-3-030?sequence=1#page=295

Baki, M., & Arslan, S. (2017). Effects of mathematics content knowledge on mathematics pedagogical content knowledge. *Journal of Teacher Education and Educators, 6*(1), 53–68. https://dergipark.org.tr/en/download/article-file/646736

Balalle, H., & Pannilage, S. (2025). Reassessing academic integrity in the age of AI: A systematic literature review on AI and academic integrity. *Social Sciences & Humanities Open*, *11*, 101299. https://doi.org/10.1016/j.ssaho.2025.101299

Balwant, P. T. (2018). The meaning of student engagement and disengagement in the classroom context: Lessons from organisational behaviour. *Journal of further and higher education*, *42*(3), 389-401. https://doi.org/10.1080/0309877X.2017.1281887

Bannister-Tyrrell, M., Mavropoulou, S., Jones, M., Bailey, J., & O'Donnell-Ostini, A. (2018). Initial teacher preparation for teaching students with exceptionalities: Pre-service teachers' knowledge and perceived competence. *Australian Journal of Teacher Education (Online)*, *43*(6), 19-34. https://search.informit.org/doi/reader/10.3316/ielapa.689599024301444

Barr, R. B. (1998). Obstacles to implementing the learning paradigm—What it takes to overcome them. *About Campus*, *3*(4), 18-25. https://doi.org/10.1177/1086482298003004

Bidokht, M. H., & Assareh, A. (2011). Life-long learners through problem-based and self directed learning. *Procedia Computer Science, 3*, 1446–1453. https://doi.org/10.1016/j.procs.2011.01.028

Botes, R., & Goede, R. (2014). Bridging the gap for IT students: Action research and design science research as research approaches for life-long learners. In *ISTE International Conference on Mathematics, Science and Technology Education* (p. 330). http://irepo.futminna.edu.ng:8080/jspui/bitstream/123456789/4024/1/OA-Ferreira-iste_past-conf-proceedings_2014.pdf#page=330

Brynjulf Hjertø, K., Merok Paulsen, J., & Petteri Tihveräinen, S. (2014). Social-cognitive outcomes of teachers' engagement in learning communities. *Journal of Educational Administration*, *52*(6), 775-791. https://doi.org/10.1108/JEA-07-2013-0074

Burkhard, M. (2022). Student Perceptions of AI-Powered Writing Tools: Towards Individualized Teaching Strategies. *International association for Development of the Information Society*. https://files.eric.ed.gov/fulltext/ED626893.pdf

Busa, J., & Chung, S. J. (2024). The effects of teacher-centered and student-centered approaches in TOEIC reading instruction. *Education Sciences*, *14*(2), 181. https://doi.org/10.3390/educsci14020181

Campbell, S., Greenwood, M., Prior, S., Shearer, T., Walkem, K., Young, S., ... & Walker, K. (2020). Purposive sampling: Complex or simple? Research case examples. *Journal of Research in Nursing, 25*(8), 652–661. https://doi.org/10.1177/1744987120927206

Cassidy, K. J., Sullivan, M. N., & Radnor, Z. J. (2021). Using insights from (public) services management to improve student engagement in higher education. *Studies in Higher Education*, *46*(6), 1190-1206. https://doi.org/10.1080/03075079.2019.1665010

Cowan, J., George, J. W., & Pinheiro-Torres, A. (2004). Alignment of developments in higher education. *Higher education*, *48*(4), 439-459. https://doi.org/10.1023/B:HIGH.0000046722.64326.dc

Dempere, J., Modugu, K., Hesham, A., & Ramasamy, L. K. (2023, September). The impact of ChatGPT on higher education. In *Frontiers in Education* (Vol. 8, p. 1206936). Frontiers Media SA. https://doi.org/10.3389/feduc.2023.1206936

Desmet, T., Brijs, M., Vanderdonck, F., Tops, S., Simoens, S., & Huys, I. (2024). Implementing the EU HTA regulation: Insights from semi-structured interviews on patient expectations, Belgian and European institutional perspectives, and industry outlooks. *Frontiers in Pharmacology, 15*, 1369508. https://doi.org/10.3389/fphar.2024.1369508

Dhaliwal, M. K. (2015). Teachers becoming lifelong learners. *The Business & Management Review, 5*(4), 259. https://cberuk.com/cdn/conference_proceedings/2015iciee_india46.pdf

Dietrich, J., Schmiedek, F., & Moeller, J. (2022). Academic motivation and emotions are experienced in learning situations, so let's study them. Introduction to the special issue. *Learning and Instruction*, *81*, 101623. https://doi.org/10.1016/j.learninstruc.2022.101623

Evans, T., Klymchuk, S., Murphy, P. E., Novak, J., Stephens, J., & Thomas, M. (2022). Engagement of undergraduate STEM students: the influence of non-routine problems. *Higher Education Research & Development*, *41*(1), 146-162. https://doi.org/10.1080/07294360.2020.1835838

Fernandez, C. (2014). Knowledge base for teaching and pedagogical content knowledge (PCK): Some useful models and implications for teachers' training. *Problems of Education in the 21st Century, 60*(1), 79–100. https://www.researchgate.net/publication/282330568

FitzSimons, G. E. (2014). Commentary on vocational mathematics education: where mathematics education confronts the realities of people's work. *Educational Studies in Mathematics*, *86*(2), 291-305. https://doi.org/10.1007/s10649-014-9556-0

Ford, N., & Chen, S. Y. (2001). Matching/mismatching revisited: An empirical study of learning and teaching styles. *British Journal of Educational Technology*, *32*(1), 5-22. https://doi.org/10.1111/1467-8535.00173

Garrison, D. R., Anderson, T., & Archer, W. (1999). Critical inquiry in a text-based environment: Computer conferencing in higher education. *The internet and higher education*, *2*(2-3), 87-105. https://doi.org/10.1016/S1096-7516(00)00016-6

Gildersleeve, R. E., Kuntz, A. M., Pasque, P. A., & Carducci, R. (2010). The role of critical inquiry in (re) constructing the public agenda for higher education: Confronting the conservative modernization of the academy. *The Review of Higher Education*, *34*(1), 85-121. https://doi.org/10.1353/rhe.2010.0009

Grabinger, S., & Dunlap, J. C. (2002, October). Problem-based learning as an example of active learning and student engagement: Invited talk. In *International Conference on Advances in Information Systems* (pp. 375-384). Berlin, Heidelberg: Springer Berlin Heidelberg. https://doi.org/10.1007/3-540-36077-8_39

Gudmundsdottir, S., & Shulman, L. (1987). Pedagogical content knowledge in social studies. *Scandinavian Journal of Educational Research, 31*(2), 59–70. https://doi.org/10.1080/0031383870310201

Gunduz, N., & Hursen, C. (2015). Constructivism in teaching and learning: Content analysis evaluation. *Procedia-Social and Behavioral Sciences, 191*, 526–533. https://doi.org/10.1016/j.sbspro.2015.04.640

Hammarberg, K., Kirkman, M., & De Lacey, S. (2016). Qualitative research methods: When to use them and how to judge them. *Human Reproduction, 31*(3), 498–501. https://doi.org/10.1093/humrep/dev334

Han, Y. (2021). Emerging research efficacy through scaffolded research practice: An EFL preservice teacher autobiographical narrative. *Chinese Journal of Applied Linguistics*, *44*(1), 35-53. https://doi.org/10.1515/CJAL-2021-0003

Hashim, H. (2021). Pre-service teachers' views on the implementation of game-based learning for academic writing skills. *Sains Insani*. https://www.academia.edu/download/98138870/157.pdfhttps://www.academia.edu/download/98138870/157.pdf

Hepner, S. L., & Carlson, T. E. (2018, December). Active learning to develop key research skills in master's level computer science coursework. In *2018 IEEE International Conference on Teaching, Assessment, and Learning for Engineering (TALE)* (pp. 840-845). IEEE. https://doi.org/10.1109/TALE.2018.8615196

Hoft, J. (2021). Anonymity and confidentiality. In *The Encyclopedia of Research Methods in Criminology and Criminal Justice* (Vol. 1, pp. 223–227). https://doi.org/10.1002/9781119111931.ch41

Ichsan, I. Z., Hasanah, R., Ristanto, R. H., Rusdi, R., Cahapay, M. B., Widiyawati, Y., & Rahman, M. M. (2020). Designing an innovative assessment of HOTS in the science learning for the 21st century. *Jurnal Penelitian dan Pembelajaran IPA, 6*(2), 211–224. http://dx.doi.org/10.30870/jppi.v6i2.4765

Jacobs, M. K., & Govender, S. (2020). Evaluation of the implementation of Education White Paper 6 in selected full-service schools in KwaZulu-Natal. *e-BANGI, 17*(3), 111–128. https://hdl.handle.net/10530/1445

Kayal, A. (2024). Transformative pedagogy: A comprehensive framework for AI integration in education. In *Explainable AI for education: Recent trends and challenges* (pp. 247-270). Cham: Springer Nature Switzerland. https://doi.org/10.1007/978-3-031-72410-7_14

Kirkwood, A., & Price, L. (2014). Technology-enhanced learning and teaching in higher education: what is 'enhanced'and how do we know? A critical literature review. *Learning, media and technology*, *39*(1), 6-36. https://doi.org/10.1080/17439884.2013.770404

Klykken, F. H. (2022). Implementing continuous consent in qualitative research. *Qualitative Research, 22*(5), 795–810. https://doi.org/10.1177/14687941211014366

Korhonen, H., Heikkinen, H. L., Kiviniemi, U., & Tynjälä, P. (2017). Student teachers' experiences of participating in mixed peer mentoring groups of in-service and pre-service teachers in Finland. *Teaching and Teacher Education, 61*, 153–163. https://doi.org/10.1016/j.tate.2016.10.011

Krause, K. L. (2001). The university essay writing experience: A pathway for academic integration during transition. *Higher Education Research & Development*, *20*(2), 147-168. https://doi.org/10.1080/07294360123586

Kumar, V. R., & Raman, R. (2022, March). Student Perceptions on Artificial Intelligence (AI) in higher education. In *2022 IEEE integrated STEM education conference (ISEC)* (pp. 450-454). IEEE. https://doi.org/10.1109/ISEC54952.2022.10025165

Kwok, A. (2021). Managing classroom management preparation in teacher education. *Teachers and Teaching, 27*(1–4), 206–222. https://doi.org/10.1080/13540602.2021.1933933

Lawson, H. A., & Lawson, M. A. (2020). Student engagement and disengagement as a collective action problem. *Education Sciences*, *10*(8), 212. https://doi.org/10.3390/educsci10080212

Letele, M. J., Alexander, G., & Swanepoel, Z. I. (2013). Matching/mismatching of teaching and learning styles in rural learning ecologies of Lesotho: Does it enhance academic achievement. *Journal of Human Ecology*, *41*(3), 263-273. https://www.academia.edu/download/105515174/JHE-41-3-263-13-2322-Alexander-G-Tx_5B9_5D.pmd.pdf

Magaldi, D., & Berler, M. (2020). Semi-structured interviews. In *Encyclopedia of Personality and Individual Differences* (pp. 4825–4830). https://doi.org/10.1007/978-3-319-28099-8_857-1

Mansour, N., Çevik, M., Yagci, A., Alotaibi, S. B. M., & Heba, E. D. (2024). Modeling the factors influencing secondary students' performance in STEM subjects. *Journal of Baltic Science Education, 23*(3), 518–535. https://earsiv.kmu.edu.tr/bitstreams/b40f6fa0-dfa2-4dd8-b8a0-7727fe02add7/download

Masuku, M. M., & Masuku, S. L. (2023). The implementation of international protocols and treaties on inclusive education in the African context. In *Using African Epistemologies in Shaping Inclusive Education Knowledge* (pp. 141–162). Springer Nature Switzerland. https://doi.org/10.1007/978-3-031-31115-4_9

Mazana, M. Y., Montero, C. S., & Casmir, R. O. (2020). Assessing students' performance in mathematics in Tanzania: The teacher's perspective. *International Electronic Journal of Mathematics Education, 15*(3), em0589. https://doi.org/10.29333/iejme/7994

Moosa, D. (2013). Challenges to anonymity and representation in educational qualitative research in a small community: A reflection on my research journey. *Compare: A Journal of Comparative and International Education, 43*(4), 483–495. https://doi.org/10.1080/03057925.2013.797733

Munastiwi, E. (2021). Adaptation of teaching-learning models due to COVID-19 pandemic: Challenge towards teachers' problem-solving skills. *Jurnal Ilmiah Sekolah Dasar, 5*(1), 33–44. https://doi.org/10.23887/jisd.v5i1.32695

Mutanga, M. B., Jugoo, V., & Adefemi, K. O. (2024). Lecturers' Perceptions on the Integration of Artificial Intelligence Tools into Teaching Practice. *Trends in Higher Education*, *3*(4), 1121-1133. https://doi.org/10.3390/higheredu3040066

Naeem, M., Ozuem, W., Howell, K., & Ranfagni, S. (2023). A step-by-step process of thematic analysis to develop a conceptual model in qualitative research. *International Journal of Qualitative Methods, 22*, 16094069231205789. https://doi.org/10.1177/1609406923120578

Ndiku, J. M., & Kaluyu, V. (2020). Learner perspective of pedagogy for improved performance in STEM subjects: A literature review. *IOSR Journal of Research & Method in Education, 10*(4), 15–27. https://doi.org/10.9790/7388-1004031527

Niederhauser, D. S., Salem, D. J., & Fields, M. (1999). Exploring teaching, learning, and instructional reform in an introductory technology course. *Journal of Technology and teacher Education*, *7*(2), 153-172. https://www.learntechlib.org/primary/p/9309/.

Obilor, E. I. (2023). Convenience and purposive sampling techniques: Are they the same? *International Journal of Innovative Social & Science Education Research, 11*(1), 1–7.

Olafson, L., & Quinn, L. (2003). Enlisting technology in instructional reform and teacher preparation. *Journal of Computing in Teacher Education*, *19*(4), 107-112. https://doi.org/10.1080/10402454.2003.10784473

Pekrun, R., & Linnenbrink-Garcia, L. (2012). Academic emotions and student engagement. In *Handbook of research on student engagement* (pp. 259-282). Boston, MA: Springer US. https://doi.org/10.1007/978-1-4614-2018-7_12

Pervin, N., & Mokhtar, M. (2022). The interpretivist research paradigm: A subjective notion of a social context. *International Journal of Academic Research in Progressive Education and Development, 11*(2), 419–428. https://www.academia.edu/download/88131967/the-interpretivist-research-paradigm-a-subjective-notion-of-a-social-context.pdf

Prananto, K., Cahyadi, S., Lubis, F. Y., & Hinduan, Z. R. (2025). Perceived teacher support and student engagement among higher education students: A systematic literature review. *BMC Psychology, 13*(1), 112. https://doi.org/10.1186/s40359-025-02412-w

Priya, A. (2021). Case study methodology of qualitative research: Key attributes and navigating the conundrums in its application. *Sociological Bulletin, 70*(1), 94–110. https://doi.org/10.1177/0038022920970318

Rasul, T., Nair, S., Kalendra, D., Robin, M., de Oliveira Santini, F., Ladeira, W. J., ... & Heathcote, L. (2023). The role of ChatGPT in higher education: Benefits, challenges, and future research directions. *Journal of Applied Learning and Teaching*, *6*(1), 41-56. https://doi.org/10.37074/jalt.2023.6.1.29

Sagala, P. N., & Andriani, A. (2019, March). Development of higher-order thinking skills (HOTS) questions of probability theory subject based on Bloom's taxonomy. In *Journal of Physics: Conference Series* (Vol. 1188, No. 1, p. 012025). IOP Publishing. https://doi.org/10.1088/1742-6596/1188/1/012025

Sagy, O., Hod, Y., & Kali, Y. (2019). Teaching and learning cultures in higher education: a mismatch in conceptions. *Higher Education Research & Development*, *38*(4), 849-863. https://doi.org/10.1080/07294360.2019.1576594

Saks, K. (2024). The effect of self-efficacy and self-set grade goals on academic outcomes. *Frontiers in Psychology, 15*, 1324007. https://doi.org/10.3389/fpsyg.2024.1324007

Shakib Kotamjani, S., Shirinova, S., & Fahimirad, M. (2023, December). Lecturers perceptions of using artificial intelligence in tertiary education in uzbekistan. In *Proceedings of the 7th International Conference on Future Networks and Distributed Systems* (pp. 570-578). https://doi.org/10.1145/3644713.3644797

Sherwani, K. H., & Singh, U. S. (2015). Students' Perception on Lecturer Evaluation in Higher Education. *International Journal of Social Sciences & Educational Studies*, *2*(1), 49-61. https://ijsses.tiu.edu.iq/index.php/ijsses/article/view/634/618

Sokkhey, P., & Okazaki, T. (2019, June). Comparative study of prediction models on high school student performance in mathematics. In *2019 34th International Technical Conference on Circuits/Systems, Computers and Communications (ITC-CSCC)* (pp. 1–4). IEEE. https://doi.org/10.1109/ITC-CSCC.2019.8793331

Spante, M., Hashemi, S. S., Lundin, M., & Algers, A. (2018). Digital competence and digital literacy in higher education research: Systematic review of concept use. *Cogent education*, *5*(1), 1519143. https://doi.org/10.1080/2331186X.2018.1519143

Sprake, A., & Palmer, C. A. (2022). Understanding the interpretive paradigm: A guide for sports students learning through qualitative research. *Journal of Qualitative Research in Sports Studies, 16*(1), 45–68. https://clok.uclan.ac.uk/id/eprint/48569/1/Andrew_Sprake_and_Clive_Palmer_2022_Unde.pdf

Suresh, D. (2015). Case study: Research method for social sciences. *SSRN Electronic Journal*. https://papers.ssrn.com/sol3/Delivery.cfm/SSRN_ID2686385_code2450204.pdf?abstractid=2684644&mirid=1

Tan, J., Mao, J., Jiang, Y., & Gao, M. (2021). The influence of academic emotions on learning effects: A systematic review. *International journal of environmental research and public health*, *18*(18), 9678. https://doi.org/10.3390/ijerph18189678

Tang, K. H. D. (2023). Student-centered approach in teaching and learning: What does it really mean?. *Acta Pedagogia Asiana*, *2*(2), 72-83. https://doi.org/10.53623/apga.v2i2.218

Taranto, D., & Buchanan, M. T. (2020). Sustaining lifelong learning: A self-regulated learning (SRL) approach. *Discourse and Communication for Sustainable Education, 11*(1), 5–15. https://doi.org/10.2478/dcse-2020-0002

Thake, A. M. (2025). Curriculum design and professional alignment in public policy graduate programs: A case study of post-experience professionals. *Journal of Public Affairs Education*, 1-23. https://doi.org/10.1080/15236803.2025.2484095

Ting, F. S., Shroff, R. H., Lam, W. H., Garcia, R. C., Chan, C. L., Tsang, W. K., & Ezeamuzie, N. O. (2023). A meta-analysis of studies on the effects of active learning on Asian students' performance in science, technology, engineering and mathematics (STEM) subjects. *The Asia-Pacific Education Researcher, 32*(3), 379–400. https://doi.org/10.1007/s40299-022-00661-6

Tomlinson, C. A. (2022). *Everybody's classroom: Differentiating for the shared and unique needs of diverse students*. Teachers College Press.

Tripathi, K. P. (2022). Classroom action research on solving problems in Janapriya Multiple Campus, Pokhara. *AWADHARANA*, 126–139. https://doi.org/10.3126/awadharana.v7i1.49157

Van Merriënboer, J. J., & De Bruin, A. B. (2013). Research paradigms and perspectives on learning. In *Handbook of research on educational communications and technology* (pp. 21-29). New York, NY: Springer New York. https://doi.org/10.1007/978-1-4614-3185-5_2

Vargas-Murillo, A. R., de la Asuncion, I. N. M., & de Jesús Guevara-Soto, F. (2023). Challenges and opportunities of AI-assisted learning: A systematic literature review on the impact of ChatGPT usage in higher education. *International Journal of Learning, Teaching and Educational Research*, *22*(7), 122-135. https://doi.org/10.26803/ijlter.22.7.7

Vlasenko, K., Chumak, O., Achkan, V., Lovianova, I., & Kondratyeva, O. (2020). Personal e-learning environment of a mathematics teacher. *Universal Journal of Educational Research, 8*(8), 3527–3535. https://www.academia.edu/download/64461841/UJER28-19516289.pdf

Wu, W. H., Kao, H. Y., Wu, S. H., & Wei, C. W. (2019). Development and evaluation of affective domain using student's feedback in entrepreneurial Massive Open Online Courses. *Frontiers in psychology*, *10*, 1109. https://doi.org/10.3389/fpsyg.2019.01109

Yanuarto, W. N. (2020). A classroom action research (CAR): Students' creativity enhancement through problem solving learning. *Indonesian Journal of Mathematics Education, 3*(1), 1–7. https://scholar.archive.org/work/jdo53ybykjcmrmehsmzdu6tqqm/access/wayback/https://jurnal.untidar.ac.id/index.php/ijome/article/download/2324/1318

Zaky, H. (2019). Infield education: Enhancing adult learners' affective domain for transformative learning endorsement. *Cogent Education*, *6*(1), 1693679. https://doi.org/10.1080/2331186X.2019.1693679

Žukauskas, P., Vveinhardt, J., & Andriukaitienė, R. (2018). *Management culture and corporate social responsibility*. BoD–Books on Demand.