TWIST

Reflections from a Group of First-Year Students Studying Life Sciences at a University

Vuyokazi Momoti
Walter Sisulu University, South Africa

Abstract

Background: This study investigates the experiences of first-year students attending Life Sciences lectures at a South African university. Grounded in Kolb's Experiential Learning Theory, the research aims to enhance teaching practices by aligning them with experiential learning principles to better support student engagement and academic success.

Method: A quantitative research design was employed within a positivist paradigm to ensure objectivity and generalizability. Data were collected via a cross-sectional survey administered anonymously to a random sample of 16 students. A 4-point Likert scale questionnaire was developed, comprising 18 constructs reflecting key dimensions of experiential learning. Data were analyzed and presented using graphs and charts.

Findings: Students reported high satisfaction with concept clarity, technology integration, real-world relevance, and feedback. However, lower satisfaction was noted in areas such as lecture scheduling, teaching method variety, and classroom participation. These results highlight the need for more flexible and inclusive instructional approaches.

Contribution: The study offers practical recommendations for improving Life Sciences education, including blended learning models, varied assessments, and enhanced support systems. It advocates for reinforcing successful practices and implementing transparent communication and staff development to align teaching with student expectations and contemporary educational standards.

INTRODUCTION

The study investigates the experiences of new students at a university during Life Sciences lectures. When students start university, they encounter a new environment. They face specific demands, especially in their academic work, and staff have certain expectations about how students should perform their roles. Students also bring their own attitudes and expectations about the university's functions and goals, which may or may not align with those of the teaching staff. Through the interaction of these differing perceptions, students develop a more realistic and practical approach to their university experience. New students often face significant challenges when transitioning from high school to university. This study can help identify specific difficulties they encounter in Life Sciences lectures, allowing for targeted support and interventions. By analyzing student experiences, educators can gain insights into which teaching methods are most effective. This can lead to the adoption of more engaging and interactive teaching strategies that cater to diverse learning styles. Understanding what engages students in Life Sciences lectures can help in designing content and activities that maintain their interest and motivation. This is particularly important in a subject that can be complex and challenging

In the United Kingdom, Hassel and Ridout (2018) conducted a study to determine what expectations students hold when starting university education, and what expectations university lecturers have of students entering university. Lecturers (n = 20) and first year students (n = 77) completed a series of questionnaires concerning their expectations of learning in HE (staff and students) and their approach to teaching (staff). Results revealed that students have largely realistic expectations of university. For example, the majority expected to be in charge of their own study. Some unrealistic expectations were that teaching would be the same at university as it had been at school. The expectation that lecturers would provide detailed notes varied as a function of student age of student engagement than did experienced lecturers.

From an African perspective, Masaiti (2020) conducted a study at the University of Zambia that explored the concept of rurality and its impact on students' transition to higher education. The research focused on students from rural

backgrounds and employed unstructured interviews with sixteen conveniently sampled participants to gather rich, lived-experience data. The aim was to understand how their rural upbringing influenced their adjustment and learning experiences at the university. Through categorical analysis, five key themes emerged: the context of rurality among students, the process of transitioning to university life, challenges encountered, coping strategies adopted, and the support systems available to facilitate progression and completion. The findings revealed that students from rural areas face significantly more challenges in adapting to university life compared to their urban and suburban counterparts. Despite the existence of affirmative admission policies, the study highlighted a lack of institutional mechanisms to mitigate the cultural shock experienced by these students upon entering the university environment.

From a South African standpoint, Uleanya (2022) investigated the learning difficulties faced by undergraduate students attending rural universities across Africa. The study revealed that these students commonly encounter challenges such as cognitive learning difficulties, weak academic foundations, academic misconduct involving both staff and students, and strained lecturer-student relationships. These issues are largely attributed to inadequate educational infrastructure and the socio-economic conditions of students' families. Based on these findings, the study recommends the provision of essential facilities and structures to support effective teaching and learning. It also advocates for the recruitment of additional lecturers and the promotion of positive, respectful relationships between students and faculty. Furthermore, the study emphasizes the need for policies that enhance campus safety and support the use of appropriate languages of instruction. Ultimately, it calls for greater attention to the quality of university education in developing African countries.

The researcher identified a gap due to little scholarly literature on student first time experiences in a Life Sciences lecture at a university in South Africa.

Research questions

1. What challenges do new university students face during Life Sciences lectures, and how do they overcome them?
2. What are the expectations of new university students regarding Life Sciences lectures, and to what extent are these expectations met?

LITERATURE REVIEW

Challenges during lectures

Life Sciences, as a field of study, often introduces complex theories and specialized terminology that can be difficult for first-year students to comprehend initially (El Hammoumi, Zerhane & Idrissi, 2022). Voelkel et al. (2023) highlight that the rapid pace of university lectures can be overwhelming, particularly for students who are still developing essential academic skills such as effective note-taking. This often results in students missing key information during lectures. Furthermore, the pressure to perform well and the fear of speaking in large lecture halls can contribute to anxiety, which may negatively impact learning outcomes (Le, 2021).Student motivation may decline when the material is perceived as either too challenging or insufficiently engaging (Darmayanti et al., 2023). Many first-year students also feel reluctant to participate in discussions or ask questions in large classroom settings, which can lead to feelings of isolation (Chung, 2021; Ahmad, 2021). Building meaningful relationships with peers and academic staff is another common challenge, often affecting students' sense of belonging and access to academic support (Kirby & Thomas, 2022).

Balancing academic demands with personal responsibilities requires strong time management skills, an area where many new students are still developing competence (Ramlan, 2024). Additionally, navigating academic resources such as libraries and digital databases can be daunting (Sultan & Rafiq, 2021). Research by Owusu-Agyeman and Mugume (2023) underscores the importance of social integration in facilitating academic adjustment. Their study found that intellectual engagement, peer collaboration, and access to online learning platforms significantly enhance students' ability to adapt. Strong social connections with classmates and instructors were shown to improve academic performance and ease the transition into university life.

Expectations of new university students regarding Life Sciences lectures

Naylor, Bird, and Butler (2021) emphasize that students' expectations regarding academic workload, behavior, resource use, roles, and relationships play a crucial role in shaping their success and satisfaction in higher education. Similarly, educators' expectations of student conduct significantly influence the learning environment. When these expectations are misaligned, it can lead to reduced student satisfaction and diminished staff morale.The transition from secondary school to university is often a difficult and disorienting experience for many students. Hassel and Ridout (2018) highlight that a gap between students' expectations and the realities of university life can result in emotional distress, poor academic performance, and increased dropout rates. First-year students commonly anticipate engaging lectures that incorporate discussions, Q&A sessions, and practical activities. They also expect theoretical content to be connected to real-world applications through case studies and laboratory work (O'Neill & Short, 2025).

Valtonen (2021) notes that students entering university typically seek a supportive learning environment where they feel comfortable asking questions and receiving guidance. Cameron and Rideout (2022) argue that the first year is a critical period of academic and personal development. During this time, students begin to cultivate self-directed learning skills, often with peer support; however, many continue to struggle with becoming effective learners by the end of the year.Meganathan (2024) found that students value well-structured lectures with clear objectives and accessible learning

materials. With the growing integration of technology in education, students increasingly expect the use of multimedia tools such as videos, animations, and simulations—to support their understanding of complex topics. Tuma (2021) adds that students often feel overwhelmed by the volume and complexity of the content they are expected to master.

THEORETICAL FRAMEWORK

Experiential Learning Theory (ELT) was developed by David Kolb in 1984. This theory emphasizes learning through experience, which is particularly effective in Life Sciences where practical, hands-on activities are common. The Experiential Learning Cycle involves a four-stage cycle that emphasizes learning as a continuous process. Learning begins with a concrete experience, where the learner actively engages in an activity or task. After the experience, the learner reflects on what happened, considering their feelings and thoughts about the experience. The learner then engages in abstract thinking to form theories, concepts, or general principles based on their reflections. Finally, the learner tests these theories and concepts in new situations, applying what they have learned to gain further insights.
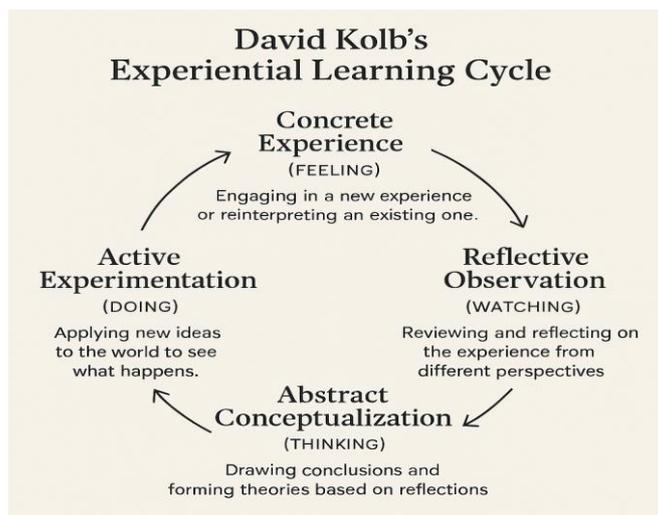

Fig. 1

David Kolb's Experiential Learning Theory (ELT), Fig. 1, is highly relevant to students' first-time experience in a Life Sciences lecture at university, especially because it helps explain how they begin to process and internalize new academic and practical knowledge. This initial exposure is the foundation of experiential learning. It's the moment they begin engaging with the subject matter directly. After the lecture, students reflect on what they understood, what confused them, and how the material connects to prior knowledge or expectations. Reflection helps students make sense of the experience, especially when the content is complex or unfamiliar. Students start forming mental models or frameworks like understanding biological systems or scientific methods—based on what they learned and reflected on. This stage helps them build theoretical understanding, which is essential for deeper learning and future application. Students apply their new knowledge in tutorials, lab sessions, or assignments, testing hypotheses, solving problems, or conducting experiments. This reinforces learning and allows students to see how theory translates into practice, which is central to Life Sciences. Life Sciences often involve hands-on learning such as lab work, field studies, and simulations. ELT supports active engagement which helps students retain complex scientific information. It encourages critical thinking and adaptability essential for scientific inquiry and problem-solving transforming experience. In this model, experience is grasped through concrete experience (experiencing) and abstract conceptualization (thinking); thereafter, experience is transformed through reflective experimentation (reflecting) and active experimentation (acting). This model is presented as a learning cycle or spiral, in which learning touches all four components and the outcome is based on the tension created between all four components. Immediate and concrete experience (acting) are based on reflection and observations. The reflections lead to new concepts that eventually lead to new implications and the cycle continues.

Data collection

The data was collected using students' first time experience instrument questionnaire that included 16 questions. The data collected questioned 5 areas of impact on student perceptions about their experiences in a Life Sciences Lecture. The questionnaire was completed within a university and 16 students were chosen by convenience sampling method. The students responded anonymously and all the students' demographic details were coded to protect their confidentiality, a process suggested by Gobingca (2021) as good practice. Students were informed about confidentiality and the right to withdraw their participation at any time during the study and informed consent was gained through the students opting in to completing the questionnaire.

Demographics of the sample

Students that participated in the study were 16 (N=16); comprised of 4 males and 12 females. This data shows that female participants make up much of the sample, accounting for three-quarters (75%) of the group, while male participants represent only one-quarter (25%). This suggests a gender imbalance in the sample, which may be relevant when analyzing

perspectives, experiences, or outcomes in gender-sensitive studies. The sample is evenly split between two age groups, with 50% of participants under 18 and 50% between 20 and 25 years old. This suggests a balanced representation of younger and slightly older individuals, which may be useful for comparing perspectives or experiences across these age ranges.

Table 1 Descriptive analysis of student's reflections in a Life Science lectures

Gender

	N	%
Male	4	25,0%
Female	12	75,0%

Age

	N	%
under 18	8	50,0%
20-25	8	50,0%

Table 2

| Construct	Label	Strongly Disagree	Disagree	Agree	Strongly Agree	Total	Positive (%)
Construct1	The lecture content is engaging and interesting	1	0	5	10	16	93.8
Construct2	The pace of lectures is appropriate for my understanding	0	1	12	3	16	93.8
Construct3	The lecturer explains concepts clearly and effectively	0	0	9	7	16	100
Construct4	I feel comfortable aking questions during the lecture	0	2	11	3	16	87.5
Construct5	The lecture materials are helpful and well organised	0	1	8	7	16	93.8
Construct6	The lectures help me understand the subject better	0	0	8	8	16	100
Construct7	The lecturer encourages student participation	0	0	7	9	16	100
Construct8	The lecture environment is conducive to learning	0	1	8	7	16	93.8
Construct9	The lecture integrates real-world examples that enhance my understanding	0	0	8	8	16	100
Construct10	The lecturer uses a variety of teaching methods to cater for different learning	0	3	7	6	16	81.3
Construct11	The lecture schedule is well-organized and predictable	1	3	8	4	16	75
Construct12	The lecturer provides timely and constructive feedback on assignments	0	0	7	9	16	100
Construct13	The lecture encourages critical thinking and problem-solving	0	1	6	9	16	93.8
Construct14	The lecturer is approachable and available for extra help outside of class	0	0	9	7	16	100
Construct15	The lecture includes interactive elements (discussions, group work)	0	2	6	8	16	87.5
Construct16	The lecture helps me to feel more confident in my knowlwdge of Life Sciences	0	2	5	9	16	87.5
Construct17	The lecturer effectively uses technology to enhance the learning experience	0	0	5	11	16	100
Construct18	The lecture content is relevant to my academic goals	0	0	5	11	16	100
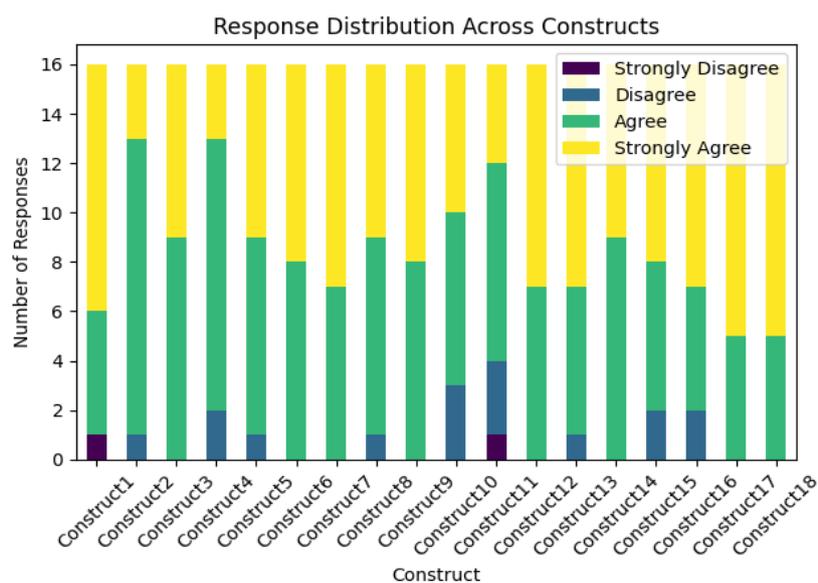
Fig. 2

FINDINGS

Constructs with 100% positive sentiment (Table 2) constructs 3, 6, 7, 9, 12, 14, 17, 18) reflect strong student satisfaction in areas such as concept clarity, use of technology, real-world relevance and feedback and support. Consistently high across all constructs, with variation in intensity.

Based on Table 2, constructs 4, 10, 11, 15, and 16 show notable disagreement. Construct11 (75%) and Construct10 (81.3%) show the lowest positive sentiment, indicating concerns with lecture scheduling and a variety in teaching methods. Constructs like 4, 15, and 16 (87.5%), see Table 2 and Fig. 2, suggest general approval but also room for enhancement in   comfort in asking questions, interactive elements and confidence building.

DISCUSSION

Experiential Learning Theory (ELT), as proposed by Kolb, emphasizes learning through experience, reflection, and active engagement, making it particularly relevant in higher education settings (Kolb, 1984). Based on the analysis presented in Table 1, Constructs 3, 6, 7, 9, 12, 14, 17, and 18—which align with ELT principles—received 100% positive sentiment, indicating strong student satisfaction in areas such as concept clarity, effective use of technology, real-world relevance, and feedback and support. These findings reflect the transformative potential of ELT in fostering deep and meaningful learning experiences (Leong & Ma, 2023).

Conversely, constructs 4, 10, 11, 15, and 16 showed notable disagreement, with Construct 11 (75%) and Construct 10 (81.3%) registering the lowest positive sentiment, suggesting student concerns regarding lecture scheduling and variety in teaching methods. While Constructs 4, 15, and 16 achieved 87.5% positive sentiment, they also highlight areas for improvement, particularly in comfort in asking questions, interactive engagement, and confidence building. These results underscore the importance of refining pedagogical strategies to better align with ELT constructs and enhance student satisfaction (Hough et al., 2024).

Learning Preferences

Younger students (under 18) often benefit from structured, guided learning environments that incorporate interactive and visually engaging content, which supports their developmental stage and cognitive engagement. In contrast, students aged 20–25, who are typically more independent and experienced, tend to value real-world relevance, autonomy in learning, and opportunities for critical thinking and reflection.

Technology Use and Feedback

Research shows that younger students are generally more adaptable to digital tools, having grown up in technology-rich environments. However, they may still require more support and feedback to use these tools effectively in academic contexts. Older students, while sometimes less frequent users of newer technologies, often have more defined expectations for sophisticated, purposeful use of technology and timely, constructive feedback that aligns with their academic and professional goals (Staddon, 2020).

Confidence and Participation

Comfort in classroom participation also varies by age. Younger students may need more encouragement and confidence-building strategies to feel comfortable asking questions or engaging in discussions. On the other hand, older students are often more assertive but may also be more critical of teaching methods and scheduling, expecting a higher degree of responsiveness and flexibility from instructors (Simonds & Brock, 2014).

Implications for Teaching Strategies

To effectively support both age groups, educators should consider a differentiated instructional approach which may include blended learning models that combine structure with flexibility, varied assessment methods to cater to diverse learning styles, flexible scheduling to accommodate different life responsibilities, and enhanced support systems to build confidence and engagement across age groups. Such strategies not only promote inclusivity but also align with best practices in age-responsive pedagogy.

RECOMMENDATIONS

Constructs with 100% positive sentiment show strong consensus and satisfaction. These should be maintained and reinforced in future programs or policies. Used as models or benchmarks for improving other constructs. The researcher advocates the use of constructs with high support to train staff or stakeholders on best practices.. In addition, communication strategies that emphasize the strengths of well-supported constructs while transparently addressing areas needing improvement should be developed.

Future research should explore how these well-supported constructs can be adapted across different departments, campuses, or contexts without losing effectiveness. Secondly to examine why certain constructs receive unanimous support while others do not, identifying underlying factors such as leadership style, communication methods, or resource allocation.

DECLARATION OF CONFLICT OF INTEREST

The author declares no conflict of interest.

ETHICAL CONSIDERATION

The study received ethical clearance from the ethics committee and was issued a certificate of approval, referenced as FEDSRECC014-03-23

REFERENCES

1. Cameron, R. B., & Rideout, C. A. (2022). 'It's been a challenge finding new ways to learn': first-year students' perceptions of adapting to learning in a university environment. *Studies in Higher Education*, *47*(3), 668-682.
2. Chung, J.H.J., 2021. "We participate, silently": explicating Thai university students' perceptions of their classroom participation and communication. *Qualitative Research in Education*, *10*(1), pp.62-87.
3. Darmayanti, R., Laila, A.R.N., Khan, S., Fitriyah, I.D., Bausir, U., Setio, A. and Usmiyatun, U., 2023. Students' Attitudes Towards Learning Mathematics:" Too Soft Attitudes-Very Difficult-Boring-In A Good Way". Indonesian Journal of Learning and Educational Studies, 1(1), pp.29-50.
4. El Hammoumi, S., Zerhane, R. and Idrissi, R.J., 2022. The impact of using interactive animation in biology education at Moroccan Universities and students' attitudes towards animation and ICT in general. *Social Sciences & Humanities Open*, *6*(1), p.100293.
5. Gobingca, B.Z., 2025. Assessing the Impact of Content Knowledge of Economic and Management Sciences Teaching and Learning: A Case Study of Second Year Student-teachers in a South African University.
6. Hassel, S., & Ridout, N. (2018). An investigation of first-year students' and lecturers' expectations of university education. *Frontiers in psychology*, *8*, 2218.
7. Hough, T. L., Jenkins, I. A., Pierce, C., & Bellet, A. (2024). Balancing Act: Integrating Broad and Narrow Constructs of Experiential Learning in Higher Education. Experiential Learning and Teaching in Higher Education, 7(2). DOI
8. Kirby, L.A. and Thomas, C.L., 2022. High-impact teaching practices foster a greater sense of belonging in the college classroom. Journal of Further and Higher Education, 46(3), pp.368-381.
9. Kolb, D. A. (1984). Experiential Learning: Experience as the Source of Learning and Development. Englewood Cliffs, NJ: Prentice Hall
10. Le, H.V., 2021. An investigation into factors affecting concentration of university students. Journal of English Language Teaching and Applied Linguistics, 3(6), pp.07-12.
11. Leong, J. Y., & Ma, N. L. (2023). Using Experiential Learning Theory to Improve Teaching and Learning in Higher Education. Singapore University of Social Sciences. ERIC
12. Masaiti, G., 2020. Rurality and student transitioning in higher education: An exploration of views of University of Zambia students.
13. Meganathan, P. M. (2024). ENHANCING STUDENT ENGAGEMENT AND ACTIVE LEARNING THROUGH STUDENT PRESENTATION-BASED EFFECTIVE TEACHING (SPET) METHOD AMONG MALAYSIAN UNDERGRADUATE STUDENTS. Lim Hock Ann, AP. Dr.
14. Naylor, R., Bird, F.L. and Butler, N.E., 2021. Academic expectations among university students and staff: Addressing the role of psychological contracts and social norms. Higher Education, 82(5), pp.847-863.
15. O'Neill, G., & Short, A. (2025). Relevant, practical and connected to the real world: what higher education students say engages them in the curriculum. Irish Educational Studies, 44(1), 23-40.
16. Owusu-Agyeman, Y., & Mugume, T. (2023). Academic adjustment of first year students and their transition experiences: The moderating effect of social adjustment. Tertiary Education and Management, 29(2), 189-209.
17. Ramlan, N., Rahim, N.C.A., Saffinee, S.S. and Najid, M.H.M., 2024. The Study on Motivation and Emotion Management Among University Students for Time Management Balance. In Business Sustainability with Artificial Intelligence (AI): Challenges and Opportunities: Volume 1 (pp. 523-531). Cham: Springer Nature Switzerland.
18. Sætre, C. (2025). Behind the grades: co-constructing fairness to reach agreement in evaluative judgement. *Assessment & Evaluation in Higher Education*, *50*(2), 236-249.
19. Staddon, R. V. (2020). Bringing technology to the mature classroom: age differences in use and attitudes. International Journal of Educational Technology in Higher Education, 17(1), 11.
20. Sultan, M. and Rafiq, M., 2021. Open access information resources and university libraries: Analysis of perceived awareness, challenges, and opportunities. *The Journal of Academic Librarianship*, *47*(4), p.102367.
21. Tuma, F. (2021). The use of educational technology for interactive teaching in lectures. *Annals of Medicine and Surgery*, *62*, 231-235.
22. Uleanya, C., 2022. Rural undergraduate university students' learning challenges in Africa: case study of Nigeria and South Africa. *African Identities*, *20*(1), pp.89-117.
23. Valtonen, T., Leppänen, U., Hyypiä, M., Kokko, A., Manninen, J., Vartiainen, H., ... & Hirsto, L. (2021). Learning environments preferred by university students: a shift toward informal and flexible learning environments. *Learning Environments Research*, *24*, 371-388.
24. Voelkel, S., Bates, A., Gleave, T., Larsen, C., Stollar, E.J., Wattret, G. and Mello, L.V., 2023. Lecture capture affects student learning behaviour. *FEBS open bio*, *13*(2), pp.217-232.