

Training as a Teacher of Science at the University of Zambia: Boons and Challenges as Perceived by Students in the Science Teacher Education Programme

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ABSTRACT

This study explored the perceived benefits, challenges, and coping strategies of students enrolled in the Bachelor of Science with Education (BSc. Ed.) and Bachelor of Agriculture with Education (BAgric. Ed.) programmes at the University of Zambia. Using a qualitative approach grounded in Todorov's Narrative Structure Theory, data were collected through open-ended questionnaires administered to 140 third- and fourth-year students in May 2019. Constant comparative analysis, employing both deductive coding aligned with Todorov's five narrative stages and inductive thematic development, was used to identify emergent themes. Findings revealed that students perceived significant benefits in knowledge acquisition, skills development, and positive value formation. However, they also reported substantial challenges including overloaded curricula, inappropriate pedagogical strategies, financial constraints, accommodation shortages, inadequate learning resources, and transitioning difficulties. Coping strategies included extended study hours, formation of study groups, engagement in part-time work, and utilisation of online resources. The study highlights a tension between the programme's intended outcomes and the lived experiences of students, with implications for teacher quality and retention. Through the lens of Todorov's narrative theory, the student experience is revealed as a dynamic journey from initial equilibrium through disruption and recognition to repair and the achievement of a new, transformed equilibrium. Recommendations include curriculum review, enhanced lecturer pedagogical training, improved financial support schemes, better coordination between collaborating schools, and deliberate mentorship programmes. The findings contribute to the discourse on teacher education quality in resource-constrained higher education contexts in Sub-Saharan Africa.

Keywords: Teacher education, science education, student perceptions, coping strategies, higher education, Zambia, narrative theory

INTRODUCTION AND BACKGROUND

The Student Experience in Higher Education

The experiences of students during their higher education journey remain a complex and under-explored phenomenon (Klemenčič & Chirikov, 2015). The learning atmosphere—characterised by perceived successes, hindrances to expected achievement, and coping strategies—constitutes a cardinal dimension of students' overall experience in higher education. These experiences profoundly impact not only learning outcomes but also personal well-being and the development of responsible citizenship.

This study focuses on one specific cohort: trainee science teachers. Their experiences are shaped by the unique demands of programmes that straddle multiple disciplines. Trainee teachers pursuing the Bachelor of Science with Education (BSc. Ed.) and Bachelor of Agriculture with Education (BAgric. Ed.) degrees at the University of Zambia (UNZA) face unique challenges. They are required to endure demanding courses not necessarily designed for teachers but for technicians, scientists, and agricultural officers. Upon graduation, a high social

status is not guaranteed, as Symeonidis (2015) contends that the general perception of teachers' occupational status is 'average' across all education sectors, with the exception of higher education. This status perception is particularly acute in the Zambian context, where teaching is often viewed as a fallback profession rather than a career of choice (Hamaimbo, 2016).

Value for Money and Consumerist Ethos

Perceptions of beneficial experiences vary across individuals, academic years, and institutions. As one of the most expensive institutions in Zambia, UNZA presents a context where student perceptions of benefits may not equate to the value invested. Kandiko and Mawer (2013) found that students across all year groups, institutional types, and subjects exhibit a consumerist ethos towards higher education, demanding 'value for money.' Whether this ethos prevails among the study population remains an open question. Compounding this consumerist orientation are the financial realities facing Zambian university students. In the Zambian higher education context, access to government-funded student loans remains constrained relative to demand, with many students relying on family resources, self-financing, or part-time employment to support their studies. Consequently, students often experience considerable pressure to realise tangible economic returns from their investment in higher education (Bau, Low, Simona, & Steinberg, 2026; Masaiti, Mwelwa, & Mwale, 2016).

Learning Approaches and Engagement

Learning and teaching approaches that consistently provide pleasurable experiences are likely to enhance learning and sustained attention. Qureshi and Ullah (2014) observe that students' perceptions of the learning environment are associated with their approaches to learning. Engaging and learner-centred experiences provide worthwhile experiences, and this research sought to uncover what perceptions students hold about their learning experience. The aspiration for learner-centred approaches is well-articulated in Zambian policy, yet its translation into practice remains uneven. The shift from teacher-centred to student-centred approaches, while advocated in Zambian policy (CDC, 2013), remains unevenly implemented in practice (Mambwe, 2020).

Transition Challenges

The transition from secondary to university education presents inherent challenges, as some students fail to adapt quickly to changing circumstances. Managing any major transition may not be easy, and this equally applies to progression from one academic year to the next. Family dynamics, financial status, and time constraints may change. Yorke and Longden (2007) found that the dominant factor in first-year students' experiences in UK higher education was workload and time management. These challenges, however, do not dissipate after the first year. Instead, they may evolve and compound as students advance through their programmes. This study extends that inquiry to third- and fourth-year students with diverse socioeconomic backgrounds at UNZA, recognising that transition challenges may compound over time.

Research Gap

No study, to the best of our knowledge, has explored science education students' own perceptions and experiences of their training's benefits and challenges in the Zambian context. This perception appears to be particularly evident in the Zambian context, where empirical studies suggest that many entrants into the teaching profession do so as a career of last resort rather than as their first career choice (Banja, 2012; Hamaimbo, 2016). No study has specifically focused on students' lived experiences of the benefits and challenges of their training. To address this gap, the present study sought to give voice to students themselves. Therefore, this study sought to explore students' perceptions of accrued benefits, their interpretations of how these benefits are offset by challenges, and their coping strategies.

Research Questions

The study was guided by the following research questions:

1. What good aspects have you learnt during your training as a science trainee teacher at the University of Zambia?
2. What challenges have you experienced during your training as a science teacher at the University of Zambia, and how have they affected your training?
3. What measures are you taking to cope with the challenges you have identified during your training?

Significance of the Study

This study illuminates aspects of learning experiences that can be augmented or eliminated, and how institutions can leverage existing coping strategies to enhance student well-being and fulfilment during high-level studies. The findings are particularly relevant to Zambian teacher education policy makers, as the country seeks to improve teacher quality to meet the demands of the 21st-century education landscape.

THEORETICAL FRAMEWORK

This study is grounded in Todorov's (1969) Narrative Structure Theory, which posits that all narratives follow a fundamental arc comprising five distinct stages: an initial state of equilibrium, a disruptive event (complicating action), a period of conflict and recognition, an attempt to resolve the conflict, and a return to a new, transformed equilibrium. This theoretical lens is particularly appropriate for this study because the student teacher experience is inherently a narrative of transformation – a journey from novice to professional, marked by both affirming and challenging experiences. As Adepati and Samanik (2018) observe, narrative structure theory provides a powerful framework for understanding how individuals make sense of complex life events by organising them into coherent stories with beginnings, middles, and ends.

The choice of Todorov's framework over other theoretical perspectives (such as simple stress-coping models or satisfaction frameworks) was deliberate and theoretically justified. While models of student satisfaction (e.g., Astin's Input-Environment-Output model) focus primarily on measurable outcomes, and stress-coping models (e.g., Lazarus and Folkman's Transactional Model) emphasise individual psychological responses, Todorov's narrative theory offers a more holistic and process-oriented lens. It allows us to understand students' experiences not merely as a collection of discrete challenges and benefits, but as a **temporal, unfolding story** in which events are interconnected, meanings are constructed over time, and resolution is achieved through adaptation. This narrative perspective is particularly valuable in educational contexts, where learning itself is a developmental journey shaped by both positive and negative experiences (Clandinin & Connelly, 2000).

Operationalisation of the Framework

In this study, we operationalised Todorov's five stages to map directly onto the students' experiences in the science teacher education programme, as follows:

Stage 1: Equilibrium – This represents the initial state of students upon entering the programme. It encompasses their expectations, motivations, and perceptions of the teaching profession. Students typically enter with hopes of acquiring scientific knowledge, developing teaching skills, and achieving a professional qualification that will lead to meaningful employment. This stage is captured in the data through students' reflections on what they anticipated from the programme and their initial enthusiasm for science teaching.

Stage 2: Disruption (Complicating Action) – This stage represents the challenges and obstacles that disrupt the initial equilibrium. In this study, disruption manifests through multiple forms: pedagogical challenges (inappropriate teaching strategies by lecturers), structural challenges (overloaded curricula, timetable clashes), resource challenges (inadequate laboratory equipment, outdated library materials), and personal challenges (financial constraints, accommodation difficulties). These disruptive forces constitute the "boons and challenges" that form the central focus of this research.

Stage 3: Recognition (Conflict) – This stage involves students becoming consciously aware of the magnitude and impact of the disruptions they face. Recognition occurs when students articulate not only the existence of challenges but also their effects on academic performance, well-being, and career aspirations. For example, when students recognise that financial constraints are forcing them to miss examinations or that poor teaching strategies are hindering their conceptual understanding, they are in the recognition stage.

Stage 4: Repair the Damage (Resolution) – This stage encompasses the coping strategies students develop to mitigate the challenges they face. These include individual strategies (extended study hours, reduced social activities), collective strategies (formation of study groups, peer support), and instrumental strategies (part-time work, utilisation of online resources). The "repair" stage demonstrates student agency and resilience in navigating adversity.

Stage 5: Equilibrium Again (New Equilibrium) – This represents the transformed state that students achieve after navigating the challenges and employing coping strategies. This is not a return to the original state but a **new**, often more resilient and realistic equilibrium. Students who persist through the programme develop not only knowledge and skills but also a more nuanced understanding of the teaching profession, enhanced coping capabilities, and a strengthened professional identity. This new equilibrium is the ultimate outcome of the narrative journey.

How the Framework Guided Data Collection, Analysis, and Interpretation

The framework guided our research design in three key ways. **First**, in data collection, the open-ended questions were deliberately structured to elicit narrative responses. Question 1 ("What good aspects have you learnt?") was designed to capture perceptions of the initial and ongoing equilibrium as well as positive disruptions. Question 2 ("What challenges have you experienced... and how have they affected your training?") directly targets the disruption and recognition stages. Question 3 ("What measures are you taking to cope?") was specifically crafted to elicit the repair and restoration of equilibrium. This alignment ensured that the data collected would be amenable to narrative analysis.

Second, in data analysis, we employed a deductive-inductive thematic approach, with Todorov's stages serving as the deductive framework that structured our initial coding. We began by reading all responses holistically to gain a general sense of the narratives. We then deductively coded the data into the five stages: any text describing initial expectations or benefits was coded as "Equilibrium"; descriptions of difficulties, obstacles, or negative experiences were coded as "Disruption" or "Recognition"; and descriptions of adaptation strategies were coded as "Repair" or "New Equilibrium." Following this deductive segmentation, we inductively identified sub-themes within each narrative stage. This dual approach ensured that our findings were not only grounded in the data but also structurally aligned with our theoretical framework.

Third, in interpretation, the framework provided a coherent narrative arc for presenting the findings. Rather than presenting benefits and challenges as static, unrelated categories, the framework allowed us to construct a dynamic, process-oriented account of the student journey – showing how challenges disrupt equilibrium, how recognition of these challenges motivates coping responses, and how successful adaptation leads to a transformed equilibrium. This narrative lens reveals that challenges are not merely obstacles to be eliminated but are integral elements of a transformative story that shapes professional identity.

The application of this framework to the study is summarised in Table 1.

Table 1: Application of Todorov's Narrative Structure Theory to the Student Experience

Todorov's Stage	Application to Student Experience	Data Evidence
Equilibrium	Initial positive expectations; perceived benefits of the programme	Responses describing knowledge acquisition, skill development, and value formation

Disruption	Challenges encountered: pedagogical, financial, curriculum-related, resource constraints, transitioning difficulties	Responses describing overloaded curricula, poor teaching, financial strain, accommodation shortages
Recognition	Students' awareness of challenges and their impact on academic performance, well-being, and career aspirations	Responses explaining how challenges have "affected" their training
Repair the Damage	Coping strategies developed to mitigate challenges	Responses describing study groups, extended hours, part-time work, online resources
Equilibrium Again	Achievement of a new balance; continued pursuit of the programme despite challenges; transformed professional identity	Responses indicating persistence, resilience, and graduation despite difficulties

This framework is not merely a descriptive overlay but serves as an analytical tool that reveals the dynamic, temporal nature of the student experience – a narrative journey from initial expectations through challenges to eventual adaptation and resolution.

Implications

The findings may provide insight into redesigning future learning experiences in these programmes and will be useful to practitioners in emerging and established universities, faculty members, and instructors interested in understanding students' lived experiences in higher education. The study contributes to the growing body of literature on teacher education in Sub-Saharan African contexts.

METHODOLOGY AND DESIGN

Research Approach

This study adopted a qualitative approach, chosen because qualitative methods are valuable in providing rich descriptions of complex phenomena and illuminating the experience and interpretation of events by students with widely differing stakes and roles (Sofaer, 1999). A qualitative approach was particularly appropriate given our research aim: to explore students' subjective perceptions, interpretations, and lived experiences of their teacher training programme. Unlike quantitative approaches that would measure predefined variables, the qualitative approach allowed participants to articulate their experiences in their own words, revealing unanticipated themes and nuanced understandings. The approach aligns with the interpretive research paradigm, which emphasises understanding social phenomena through the meanings that individuals assign to their experiences (Merriam, 2009).

The choice of a qualitative approach is also consistent with the study's theoretical grounding in Todorov's Narrative Structure Theory. Narrative theory inherently requires qualitative data that capture the richness, temporality, and contextual detail of individual experiences. Open-ended questionnaires, analysed through a narrative lens, are well-suited to eliciting the kind of storied data that Todorov's framework requires.

Study Site and Context

The study was conducted at the University of Zambia (UNZA), the oldest and largest public university in the country, established in 1965. UNZA operates across multiple campuses, with the School of Education located at the Great East Road Campus in Lusaka. The BSc. Ed. and BAgric. Ed. programmes are offered through the Department of Mathematics and Science Education (MSE) within the School of Education. A distinctive feature of these programmes is their interdisciplinary nature: students are required to take courses from three different schools – the School of Education (pedagogical courses), the School of Natural Sciences (science content courses), and the School of Agricultural Sciences (agricultural content courses). This cross-school structure

creates a multi-disciplinary learning environment that, while academically enriching, presents unique coordination challenges related to timetabling, assessment, and pedagogical consistency.

The programmes are typically completed over four years of full-time study, with the third and fourth years being particularly intensive as students undertake advanced science content courses alongside pedagogical training and, in the fourth year, teaching practice in secondary schools. The student population is diverse, drawing from all ten provinces of Zambia, with varying socioeconomic backgrounds, prior educational experiences, and levels of preparedness for university study.

Research Design

A descriptive case study design was adopted, with the BSc. Ed. and BAgric. Ed. programmes serving as the bounded case (Yin, 2014). This design was chosen because it allows for an in-depth, contextualised exploration of a contemporary phenomenon within its real-world setting. The case study approach is well-suited to answering "how" and "why" questions, such as how students perceive their training and why they employ particular coping strategies. The design also aligns with the narrative theoretical framework by allowing the researchers to construct a rich, contextualised account of the student experience.

Participant Recruitment and Sampling

A purposive sampling strategy was employed to select participants who were currently enrolled in the third and fourth years of the BSc. Ed. and BAgric. Ed. programmes. This specific cohort was chosen for three reasons. First, third- and fourth-year students have completed the majority of their programme and can thus provide a holistic, retrospective perspective on the entire training journey. Second, they have experienced the full range of challenges and benefits across multiple academic years. Third, they are approaching the transition from training to professional practice, making their reflections particularly relevant to questions of teacher preparation and readiness.

The sampling frame consisted of all 140 students enrolled in the third and fourth years of these programmes. In May 2019, the research team, through the Department of Mathematics and Science Education, distributed invitation letters to all students in the target cohort. The letters explained the purpose of the study, the voluntary nature of participation, and the procedures for data collection. Students were informed that participation was entirely voluntary and that there would be no negative consequences for non-participation. All 140 students voluntarily agreed to participate, resulting in a response rate of 100%. While this represents a census rather than a sample of the target population, it is important to note that the findings are specific to this cohort and programme, and generalisation to other institutions or cohorts should be made cautiously.

Participants were drawn from four specialisations: BSc. Ed. (Physics majors), BSc. Ed. (Biology majors), BSc. Ed. (Chemistry majors), and BAgric. Ed. Approximately 37% of participants were female and 63% were male. This gender distribution is consistent with the typical composition of science teacher education programmes in Zambia, where male students remain significantly overrepresented in science disciplines (UNESCO, 2020; Mwanza, 2020). The age range of participants was 20 to 35 years, reflecting the diverse pathways into teacher education in the Zambian context, where some students enter directly from secondary school while others pursue teaching after previous work or study experience.

Data Collection Instruments and Procedures

A questionnaire consisting of three open-ended questions was administered to participants during regular class sessions in May 2019. The questionnaire was designed to capture rich qualitative data on students' perceptions of benefits, challenges, and coping strategies, and was structured as follows:

1. "What good aspects have you learnt during your training as a science trainee teacher at the University of Zambia?" (Designed to capture perceptions of equilibrium and positive experiences)

2. "What challenges have you experienced during your training as a science teacher at the University of Zambia, and how have they affected your training?" (Designed to capture disruption, recognition, and the impact of challenges)
3. "What measures are you taking to cope with the challenges you have identified during your training?" (Designed to capture repair strategies)

The decision to use open-ended questionnaires rather than interviews or focus groups was pragmatic, driven by the large number of participants ($n=140$) and the need to efficiently capture a broad range of perspectives. While interviews would have allowed for deeper probing and follow-up questions, the questionnaire approach enabled inclusion of all 140 students, providing a comprehensive snapshot of the entire cohort's experiences. The open-ended format was deliberately chosen to allow participants the freedom to respond in their own words, without the constraints of closed-ended response options. Participants were given one hour to complete the questionnaire during a scheduled class session, with research assistants available to clarify any questions about the instrument. The semi-structured nature of the questions provided opportunities for open-ended discussions about students' perceptions of their learning experiences.

Data Analysis Procedures

Data were analysed using a deductive-inductive thematic analysis approach, following the six-phase process outlined by Braun and Clarke (2006), with explicit integration of Todorov's Narrative Structure Theory. The analysis proceeded in the following stages:

Phase 1: Familiarisation with the Data. The researchers independently read and re-read all 140 questionnaire responses multiple times to achieve immersion in the data. Initial impressions, recurring ideas, and potential patterns were noted in research memos. This phase ensured that the researchers developed a holistic understanding of the students' narratives before beginning systematic coding.

Phase 2: Generating Initial Codes. Initial coding was conducted using a deductive approach, with Todorov's five narrative stages serving as the organising framework. Data were segmented and coded according to these stages: any text describing initial expectations, benefits, or positive experiences was coded as "Equilibrium"; any text describing difficulties, obstacles, or negative experiences was coded as "Disruption" or "Recognition" (with recognition specifically applied to statements about the *impact* of challenges); and any text describing strategies for dealing with challenges was coded as "Repair" or "New Equilibrium." This deductive coding was carried out on each questionnaire transcript, with codes attributed to sentences or paragraphs that represented a theme or idea.

Phase 3: Searching for Themes. Following the deductive segmentation into narrative stages, we inductively searched for and identified sub-themes within each stage. For example, within the "Disruption" stage, we identified sub-themes including "inappropriate pedagogical strategies," "financial constraints," "accommodation shortages," "overloaded curricula," and "transitioning difficulties." Within the "Repair" stage, we identified sub-themes including "study groups," "extended study hours," "part-time work," and "utilisation of online resources." This dual deductive-inductive approach ensured that the analysis was both theoretically grounded and responsive to emergent patterns in the data.

Phase 4: Reviewing Themes. Themes were reviewed and refined to ensure they accurately represented the data and were distinct from one another. The researchers held regular debriefing sessions to discuss emerging themes, challenge assumptions, and reach consensus on the final thematic structure. Disagreements were resolved through discussion and, where necessary, by referring back to the raw data.

Phase 5: Defining and Naming Themes. Each theme was clearly defined, and illustrative participant quotations were identified to provide evidence for each theme. The final thematic structure was organised around Todorov's narrative arc to present the student journey in a coherent, process-oriented manner.

Phase 6: Producing the Report. The final phase involved writing up the findings, using participant quotations to illustrate each theme and presenting the narrative journey from equilibrium through disruption and recognition to repair and new equilibrium.

To enhance the rigour of the analysis, two researchers independently coded a sample of 25% of the questionnaires to ensure inter-coder reliability. The coding was then discussed, discrepancies were resolved through consensus, and the final coding framework was applied to the remaining data. The inter-coder agreement rate was 87%, indicating a high level of consistency in the application of the coding framework.

Ethical Considerations

Prior to data collection, the research team provided all potential participants with a detailed information sheet explaining the study's purpose, procedures, potential risks (which were minimal, involving no more than the usual time commitment and reflection on educational experiences), and the voluntary nature of participation. Students were assured that their participation or non-participation would have no bearing on their academic standing or relationship with the university.

Written informed consent was obtained from all participants prior to completing the questionnaire. Participants were informed that they could withdraw from the study at any time without penalty. To ensure anonymity and confidentiality, all data were anonymised using unique participant codes (e.g., H4FB3 for a female biology student, BM7 for a male biology student, AM20 for a male agric student). Participant codes were used throughout the data analysis and reporting process. All data were stored on a password-protected computer accessible only to the research team, and paper questionnaires were stored in a locked filing cabinet. Data will be securely destroyed five years after completion of the study.

Trustworthiness and Rigour

To ensure the trustworthiness of the findings, we employed multiple strategies aligned with Lincoln and Guba's (1985) criteria for establishing rigour in qualitative research.

Credibility (Internal Validity): To enhance the credibility of our interpretations, we engaged in **prolonged engagement** with the data through multiple readings and re-readings of all responses. The research team's familiarity with the institutional context – as faculty members within the Department of Mathematics and Science Education – provided additional contextual understanding, though we also practiced **reflexivity** to acknowledge and bracket potential biases (see confirmability below). **Triangulation** was achieved through multiple researchers independently analysing the data and through the collection of data from multiple specialisations (Physics, Biology, Chemistry, and Agriculture), allowing us to identify both common and distinctive themes across subgroups. **Member checking** was conducted with a subset of 15 volunteer participants. We presented a summary of our preliminary thematic findings and asked participants whether the interpretations resonated with their own lived experiences. All 15 participants confirmed that the findings accurately reflected their experiences, providing valuable confirmation that our analysis was a faithful representation of their narratives.

Dependability (Reliability): To establish dependability, we maintained a detailed **audit trail** documenting our research process, including field notes on data collection, the initial coding framework, decision logs for theme development, and records of the inter-coder reliability process. Two researchers independently coded a sample of 25% of the questionnaires to ensure **inter-coder reliability**. The coding was then discussed, discrepancies were resolved through consensus, and the final coding framework was applied to the remaining data. This process ensured that the findings were consistent and reproducible within the specific research context.

Confirmability (Objectivity): We practiced **reflexivity**, with the researchers maintaining personal memos to acknowledge and bracket their own biases and assumptions about the teacher education programme. As faculty members within the department, we recognised the potential for bias – both positive and negative – in interpreting students' responses. Regular team debriefing sessions provided opportunities to challenge assumptions and ensure that interpretations remained grounded in the data rather than in researchers' prior

beliefs. The audit trail also documents the decision-making processes that led to the final thematic structure, allowing readers to assess the confirmability of the findings.

Transferability (Generalisability): While the findings are context-specific and not intended to be statistically generalisable, we have provided **thick description** of the study context, participants, and procedures to enable readers to assess the transferability of the findings to their own contexts. As Lincoln and Guba (1985) argue, transferability is the responsibility of the reader; our responsibility is to provide sufficient contextual detail to enable that assessment.

Limitations

This study has several limitations that should be acknowledged. First, the findings are based on self-reported data, which may be subject to social desirability bias (participants may have underreported negative experiences) and recall bias (participants may not accurately remember earlier experiences). Second, the use of open-ended questionnaires, while enabling inclusion of all 140 students, may have limited the depth of responses compared to what could have been achieved through in-depth interviews or focus group discussions. Interviews would have allowed for probing and follow-up questions, potentially revealing deeper nuances in participants' experiences. Third, the study was conducted at a single institution (UNZA), limiting generalisability to other Zambian or regional universities. Fourth, the cross-sectional design captures perceptions at a single point in time (May 2019) and does not capture how students' perceptions may change over the course of their programme. Fifth, the study did not include lecturer or administrator perspectives, which would have provided a more comprehensive understanding of the issues and allowed for triangulation of student-reported experiences. Sixth, the gender distribution (63% male, 37% female) reflects the broader imbalance in science education but means that female perspectives, while represented, are not proportionally equal to male perspectives. Despite these limitations, the findings offer valuable, nuanced insights into the lived experiences of science teacher trainees in a resource-constrained higher education context, contributing to the limited literature on teacher education in Sub-Saharan Africa.

With the methodology fully described, the following section presents the findings that emerged from the analysis of students' responses, organised according to Todorov's narrative arc.

FINDINGS

The findings are presented according to Todorov's (1969) narrative structure, beginning with the "Equilibrium" stage – the positive aspects and benefits that students perceived as affirming their choice to pursue science teaching. This equilibrium represents not merely the absence of challenges but the presence of meaningful learning experiences that students valued. The analysis revealed that students articulated benefits across multiple dimensions, including knowledge acquisition, skill development, and growth in values and attitudes, as detailed below.

Perceived Benefits of the Programme (Equilibrium)

Participants cited several benefits of training as a science teacher at UNZA, using terms bordering on personal growth in knowledge, skills, and values.

Acquisition of Knowledge

Participants reported enhanced knowledge across multiple dimensions as described by Anderson and Krathwohl's (2001) revised Bloom's Taxonomy.

Factual Knowledge:

Participants reported enhanced knowledge across multiple dimensions of science, reflecting what Anderson and Krathwohl (2001) classify as factual knowledge. One student captured this sense of knowledge acquisition in the following terms:

"I have taken biological science courses from the School of Natural Sciences. These courses have made me acquire biological knowledge which I did not have." (H4FB3)

Another participant echoed this sentiment, noting:

"It has enhanced my knowledge in science. When I came here in first year, I did not have much knowledge of science. I have come to appreciate that science (biology in particular) has many fields that someone can actually major in." (H4MB4)

This quotation is significant because it reveals the **transformative** nature of the training – students are not merely receiving information but are developing a fundamentally new understanding of the scope and breadth of science. In Todorov's terms, this represents the **Equilibrium** stage: students have entered the programme with certain expectations, and the acquisition of new knowledge confirms and reinforces their positive orientation towards the programme. The phrase "I have come to appreciate" indicates a **recognition** of value that strengthens the equilibrium rather than disrupting it.

Conceptual Knowledge:

Beyond factual knowledge, students reported gains in conceptual understanding – the ability to grasp underlying principles and relationships. One participant stated:

"I clearly understand various concepts in the field of science that I could not understand previously." (B6)

Another student explained the value of cross-disciplinary learning:

"Going through first year where all sciences were learnt including maths which helped to improve my memory even after majoring in Biology. My thinking capacity was widened as a result of first year mathematics." (H4MB6)

This quotation is particularly insightful as it highlights an **unanticipated benefit** – the broadening of thinking capacity through exposure to mathematics. The student is not only acquiring content knowledge but is also experiencing cognitive development that transcends disciplinary boundaries. In narrative terms, this unexpected positive outcome reinforces the **Equilibrium**, making the student more resilient to future disruptions.

Procedural Knowledge:

Students also reported gains in procedural knowledge – knowing how to do something, such as conducting laboratory experiments. One student explained:

"It has improved my scientific knowledge and abilities especially through laboratory reports since laboratory experiments contain aspects of research of scientific knowledge." (H4FB1)

"The exposure to laboratory sessions every week has helped me to understand and familiarise with practical work in biology and chemistry." (H4MB2)

These quotations reveal that students value **hands-on learning experiences** as distinct from theoretical instruction. The development of procedural knowledge through laboratory work is a key component of the **Equilibrium** – it represents the kind of practical training that students expect from a science teacher education programme.

Metacognitive Knowledge:

Perhaps most significantly, students reported gains in metacognitive knowledge – awareness and understanding of their own learning processes. One student noted:

"The training has enabled me to acquire strategies for coping up with academic pressure such as studying strategies." (H4MB20)

Another explained:

"I have learnt how to deal with pressure or how to work/manage doing things within a short period of time." (H4FB21)

"It has opened my thinking capacity wide to understand the issues that go on in the classroom setup. It has helped me to understand why certain pupils behave as they do as well as to appreciate why certain pupils perform better than others." (H4MB21)

These metacognitive gains are particularly valuable because they represent **enduring competencies** that will serve students beyond their university years. The ability to manage pressure, develop study strategies, and understand classroom dynamics are foundational to effective teaching. In narrative terms, the development of metacognitive knowledge represents a strengthening of the **Equilibrium** – students are not only learning *what* but learning *how to learn*, which will help them navigate future disruptions.

Students also benefited in terms of positive outlook, self-worth, and research capacity:

"I have been able to learn about research methods which are critically vital in studies of society behaviours and development."

"Has made me more effective and efficient, let alone relevant teacher as I am not only useful in one way or only one subject/course which is my major (chemistry), I could also offer help in teaching the basics of biology, mathematics or physics in a school that might be lacking teachers for those subjects."

Positive Personal Perception:

"I have developed a positive attitude towards my program that is not only getting trained as a teacher but also as a biologist..." (B5)

"Training at UNZA has made me become strong, focused and determined."

This last quotation is particularly significant as it reveals the **transformative** impact of the programme on students' personal qualities. In narrative terms, this represents the beginning of the **New Equilibrium** – students are already developing the resilience and determination that will characterise their transformed professional identity.

Acquisition of Skills

Participants reported acquiring psychomotor skills, generally classified as science process skills (SPS), through various activities:

Laboratory Skills:

"As Agric students we remained during the second year vacation and we were exposed to beneficial practical. During that time a lot of skills were learnt which will help us to conduct our labs as science teachers."

"I have gained some practical knowledge and skills through engaging in laboratory activities in biology and chemistry courses." (H4FB7)

"I learnt how to titrate and learnt how to demonstrate experiments through the help of the technicians." (CH6)

Presentation Skills:

"Making presentations is one of the good experiences that I have had at UNZA."

"Presentations are good training as science teachers because it makes us to know how to speak and manage a class." (H4FB8)

"We have been taught how to talk to an audience of people hence helping us in becoming a good teacher and a public speaker."

Interpersonal Skills:

"The programme has improved my social skills." (H4FB9)

"I have learnt how to socialise with different people and fit in." (H4MC10)

"Creativity, group work and tolerance has also being good aspects I have learnt from this programme."

"We learn to be social and be exposed through doing the presentations, laboratory work in MSE on Thursday so that we become good teachers. We also learn to have good manners and good communication." (PH1)

"A positive influence in terms of relationship with fellow classmates because learning about science also requires cooperation and views of others." (H4FB23)

The development of interpersonal skills through collaborative learning experiences represents a significant strengthening of the **Equilibrium** – students are not only developing technical competencies but also the social competencies that are essential for effective teaching.

Growth in Positive Values and Attitudes

Halstead and Taylor (2000, p.3) define values as "principles and fundamental convictions which act as general guides to behaviour, enduring beliefs about what is worthwhile, ideas for which one strives, standards by which particular beliefs and actions are judged to be good or desirable." Participants noted:

Confidence:

"Removing fear to stand in front of the people speaking and presenting." (B9)

"Through peer teaching, I have developed the confidence to stand in front and being able to address others." (H4FB24)

"I have acquired ability to stand on my own and support my own responses to issues."

Environmental Awareness:

"It has helped me to understand the value of things that surrounds human beings. For instance, ecosystem." (MBH4)

The growth in confidence and environmental awareness represents the development of values that will shape students' future professional practice. In narrative terms, this growth in values strengthens the **Equilibrium** and provides students with a sense of purpose that can sustain them through the disruptions they will inevitably face.

Other Benefits

Learning Resources:

"The availability of various information sources at UNZA has helped me a lot in searching for information in order to be a good science teacher." (H4MB11)

"Some lecturers have been very helpful and making sure students have all data and knowledge they need. We are free to consult them." (MAS4)

Lecturer Professionalism:

"Reporting for lessons on time as seen from most lecturers at University of Zambia and encouraging active participation in class like what some lecturers... when a question is raised by the pupil, it is referred back to the class instead of the lecturer responding to it." (H4MB12)

Technology Integration:

"Making use of technology is also another good aspect that I have experienced as this also enhances learning among students." (H4MB13)

Concrete Teaching Aids:

"When teaching on parts of the living organism, they provide specimens which we use to check the organs and sometimes they send us to catch the needed specimen hence it helps and enhances the understanding of the topic." (H4MB14)

Academic Pressure Management:

"The training has enabled me to acquire strategies for coping up with academic pressure such as studying strategies." (H4MB15)

"I have learnt how to deal with pressure or how to work/manage doing things within a short period of time." (H4FB16)

Enhanced Thinking Capacity:

"It has opened my thinking capacity wide to understand the issues that go on in the classroom setup. It has helped me to understand why certain pupils behave as they do as well as to appreciate why certain pupils perform better than others." (H4MB17)

Information Seeking Skills:

"Since not all information is given during lectures, I have developed the ability to research and find solutions on my own as well as to discover more." (H4FB18)

"Research has made me to increase my knowledge and understanding of concepts and being able to explain them." (H4FB19)

Challenges Experienced by Students (Disruption and Recognition)

The **Disruption** stage in Todorov's framework represents the challenges and obstacles that threaten the initial equilibrium. Students in this study identified multiple, interconnected challenges spanning pedagogical, financial, structural, and resource dimensions. Critically, these were not experienced as isolated difficulties but as a **cumulative burden** that collectively undermined the quality of their training experience. The following sections detail these disruptions, with attention to how students **recognised** the impact of these challenges on their academic performance and well-being.

Challenges Related to Teaching Strategies

Students reported significant concerns about the pedagogical strategies employed by some lecturers, describing these as a major disruption to their learning. One participant captured this frustration:

"Some lecturers do not have good teaching strategies and their behaviour towards students is poor." (BM7)

Another student elaborated on the specific nature of the pedagogical shortcomings:

"Lecturers don't go into detail. Only lecturing on the surface about a topic and sometimes there are words or a sentence I don't understand." (AM20)

This quotation reveals a gap between what students **need** (deep, conceptually rich instruction) and what they **receive** (superficial, surface-level delivery). In narrative terms, this represents a **Disruption** that undermines the equilibrium of expected quality education. The student's statement that "there are words or a sentence I don't understand" indicates a **Recognition** stage – the student is aware that the instruction is failing to meet their learning needs.

The use of technology, while intended to enhance learning, was sometimes experienced as a barrier:

"Lecturers used projectors and tend to move very fast making it hard for me to understand or move at the same pace with them during lectures." (BF32)

This quotation is particularly revealing because it highlights the **unintended consequences** of technology integration. While projectors can enhance visual learning, they can also enable lecturers to move through content more quickly, potentially sacrificing student comprehension for content coverage. The student's experience of being unable to "move at the same pace" is a powerful illustration of the **Disruption** caused by inappropriate pedagogical pacing.

The cumulative effect of poor teaching was described as demotivating:

"Lecturers were not as authentic as they were supposed to be when lecturing and therefore even the morale to study was sometimes bad." (CF22)

The reference to "morale" is significant – it indicates that pedagogical shortcomings affect not only cognitive learning but also **affective** dimensions of the student experience. Demotivation represents a **Recognition** that the training is falling short of expectations, potentially leading to disengagement or, in the worst cases, attrition.

Financial Challenges

Financial constraints emerged as one of the most pervasive and severe disruptions experienced by students. These challenges affected not only students' ability to pay tuition but also their capacity to engage fully in academic life. One student explained:

"This challenge has affected me because training at UNZA involves money for typing assignments and other stuff, for example, groceries." (BM2)

The practical consequences of financial strain were starkly illustrated by another participant:

"I, at least, missed two exams in first and second year due to lack of fees." (BM7)

This quotation is particularly alarming because it reveals that financial constraints directly impede academic progression. Missing examinations is not merely an inconvenience; it represents a fundamental **Disruption** that can derail a student's entire academic trajectory. The phrase "at least" suggests that the student may have missed additional exams but is reluctant to articulate the full extent of the damage.

"I have sponsorship issues despite being on 75%."

"I wanted to focus on school, I will be compelled to think about how I will raise money for my tuition fees and accommodation and that is my big challenge because in most cases and after registering they withheld my results." (AM16)

This quotation reveals the **cognitive load** imposed by financial stress – the student is unable to focus exclusively on academic work because of the constant need to think about finances. The withholding of results represents a particularly harsh consequence, as it creates a cycle of stress: students cannot access their results without paying fees, but they cannot earn money to pay fees without completing their studies. In Todorov's terms, this represents a **Disruption** that is not easily repaired, as the structural barriers (lack of financial support) are beyond the individual student's control.

Accommodation Challenges

Accommodation shortages represented another significant disruption, affecting students' ability to attend classes regularly and focus on their studies:

"This challenge has affected me because I travel a long distance to come in campus as a result I become exhausted and slow in academics." (BM2)

"This makes me perform poorly as I look for where to stay each term." (AF11)

"This affected me because I travel long distance to come in campus as a result I become exhausted and poor in my academics." (BM5)

"I have no fixed room and I have kept on moving from hostel to another trying to learn the behaviours of my roommates." (BF39)

The experience of housing insecurity is a profound **Disruption** that affects not only academic performance but also personal well-being. The constant movement from one hostel to another, the difficulty of learning new roommates' behaviours, and the exhaustion of long-distance travel all contribute to a **Recognition** that the learning environment is not conducive to academic success. The repeated references to exhaustion, poor performance, and difficulty concentrating reveal the cumulative impact of housing instability on students' capacity to engage with their studies.

Curriculum Issues

Students reported significant disruptions related to curriculum design and coordination, particularly the challenges arising from taking courses across multiple schools. One student explained:

"Combining second and third year courses have been a problem in terms of management. Example Agriculture with education we had statistics and extension studies which are third year courses in second year." (AM1)

This quotation reveals a **Disruption** rooted in curriculum sequencing – students are being required to take advanced courses before they have acquired the foundational knowledge that would enable them to succeed. This is not merely an inconvenience but a fundamental flaw in curriculum design that places students at a disadvantage from the outset.

The structural challenges of cross-school coordination were also evident:

"Having lectures from both Natural Science and Education schools, tends to result in many clashes in terms of lecture times." (BM7)

Another student elaborated:

"The timetable for the students training as teachers is quite disorganised with a lot of classes clashing with those from natural sciences." (CF45)

These timetable clashes represent a **Disruption** that is largely invisible to institutional administrators but has real, tangible consequences for students. When students are forced to choose between attending a science lecture and an education lecture, they are being denied access to essential content in both domains. The **Recognition** of this problem – as indicated by the term "disorganised" – reflects students' awareness that the institution is failing to provide a coherent educational experience.

The relevance of the curriculum to future teaching was also questioned:

"Courses that do not relate to secondary education for example plant physiology which is so deep that students spend time on that." (B42)

This quotation raises a fundamental question about the purpose of the programme. If courses are too "deep" and do not relate to what students will actually teach, students may question why they are required to take them. This represents a **Disruption** that threatens the equilibrium by undermining students' sense of purpose and relevance. In narrative terms, when students cannot see the connection between their training and their future profession, they may struggle to construct a coherent narrative of their journey.

The cumulative effect of these curriculum challenges was described in terms of physical well-being:

"Poor eating habits because courses are demanding as they require 100% dedication as a result instead of having a normal diet there times when I had to have one meal." (AF21)

This quotation is particularly sobering as it reveals that curriculum demands are not merely academic but have implications for **basic health and well-being**. When students are so overwhelmed by course demands that they cannot maintain a normal diet, the **Disruption** has extended beyond the academic sphere into the personal. This represents a **Recognition** that the programme's demands are unsustainable, leading to coping strategies that may be unhealthy in the long term.

Learning and Teaching Facilities

Inadequate resources represented a significant disruption to the quality of education:

"Most of the books in the library are out of date making it difficult to find new information in this fast changing world." (AM34)

"Most venues lack enough seats or have few proper seats to accommodate an entire class of students." (GF9)

"Materials and chemicals to use in lab are not enough." (AMA15)

"Not enough instruments to cater for all the students during the laboratory session, hence some students become passengers without learning anything." (CM18)

"From Agric no farm exposure due to farm station having few activities to learn from e.g. only 4 cows that are milked, no tractors used on the field." (AM26)

"Poor internet connection." (B10)

The lack of adequate resources represents a systemic **Disruption** that affects every aspect of the learning experience. Outdated library materials, insufficient laboratory equipment, and poor internet connectivity all contribute to a **Recognition** that the learning environment is not keeping pace with the demands of contemporary education. The phrase "students become passengers without learning anything" is particularly powerful – it

captures the **Recognition** that resource constraints are not merely an inconvenience but actively undermine the quality of learning.

Transitioning Issues

Students reported difficulties adapting to the demands of university education:

"At secondary school we were learning general mathematics but when we came to UNZA we started learning pure mathematics." (CM37)

"I remained with 'O' level mentality hence failed some course in first two years at UNZA." (CM4)

"Labs where a challenge because I didn't use lab equipment from the school I came from." (AM14)

The difficulty of transitioning from secondary to university represents an initial **Disruption** that can have lasting consequences. The reference to "O' level mentality" is particularly revealing – it indicates a **Recognition** that the student has not yet developed the cognitive and metacognitive skills required for university-level study. This recognition is a necessary precondition for the development of coping strategies, but it also represents a moment of vulnerability when students may question their ability to succeed.

University Support Systems

Students reported inadequacies in institutional support:

"I was sick in second year and was not given a chance to write some make up tests." (BM5)

"It is a well-known fact that there is no time to study during the day. Therefore closing time for the library limits the amount of time spent on studying." (AM26)

These quotations reveal a **Disruption** rooted in inadequate institutional support. The lack of provision for make-up tests when students are sick represents a failure of institutional flexibility that can have serious consequences for academic progression. The early closing of the library represents a failure to accommodate the study needs of students who may not have access to quiet study spaces elsewhere. These are not merely inconveniences but represent systemic failures that compound other disruptions.

Disturbances at the Institution

Industrial action represented a significant disruption:

"Go slow somewhat also slowed down my academic training."

"Go slow data is later offloaded in a short time." (AM20)

"Lectures tend to teach a lot of things in a very short period of time after coming from go-slow." (BF32)

Industrial action represents a **Disruption** that is entirely beyond students' control and that has cascading consequences. When lectures are postponed, material that should have been delivered over weeks is compressed into a short period, undermining the quality of instruction and the coherence of the curriculum. The student's observation that material is "offloaded in a short time" indicates a **Recognition** that the quality of learning has been compromised.

Coping Strategies (Repair)

The **Repair** stage in Todorov's framework represents the coping strategies that students develop to mitigate the challenges they face. This stage is critical because it demonstrates student agency and resilience – the capacity to respond to adversity with adaptive strategies. The analysis revealed multiple categories of coping strategies,

ranging from individual efforts to collective and instrumental approaches. These strategies, while demonstrating resilience, also raise important questions about the sustainability of such adaptations and the extent to which they represent a **New Equilibrium** or merely a temporary accommodation to systemic problems.

Coping with Teaching Methodologies

In response to pedagogical shortcomings, some students adopted a strategy of **accommodation** – adapting to the lecturer's style rather than resisting it. One student explained:

"I adopt the lecturing methods whether they are boring or not because people differ." (CF22)

This quotation reveals a pragmatic but somewhat **passive** coping strategy – the student is accepting the situation rather than attempting to change it. In narrative terms, this represents an **initial repair attempt** that is intended to restore equilibrium by reducing cognitive dissonance. The phrase "because people differ" indicates a **Recognition** that the student cannot control the lecturer's behaviour, so the only viable strategy is adaptation. However, this coping strategy also represents a missed opportunity – the student is not developing the critical stance that might lead to demands for pedagogical improvement, and is thus potentially **reproducing** poor teaching practices as a future teacher.

Coping with Financial Challenges

Students reported multiple strategies for managing financial constraints, many of which involved **instrumental action** to generate income. One participant described:

"We remain focused and starting small businesses on campus." (AM16)

Another student echoed this sentiment:

"Students have started to do their own business." (CH1)

"We are doing part-time work during holidays." (UN1)

These quotations reveal significant **entrepreneurial initiative** – students are not passively accepting financial hardship but are actively seeking ways to supplement their income. However, these strategies come at a cost. Time spent on small businesses or part-time work is time **not available** for academic study, potentially perpetuating a cycle in which financial constraints lead to reduced academic performance, which in turn affects future employment prospects. In narrative terms, while these strategies represent an attempt at **Repair**, they do not fully restore the original equilibrium – the student is achieving a **compromised equilibrium** in which financial survival is prioritised over academic excellence.

Coping with Accommodation Challenges

Students developed strategies to manage housing instability:

"We resort to be working up early if you stay far from school." (BM12)

"We look for friends who can accommodate us." (AF27)

"Being fast in looking for squatting places." (AF11)

These strategies represent pragmatic responses to housing insecurity. The need to "wake up early" to travel long distances represents an additional burden on students' time and energy. The reliance on friends for accommodation represents a social strategy that leverages peer networks but also creates potential instability. The need to be "fast in looking for squatting places" reveals the competitive nature of housing acquisition and the stress associated with housing insecurity. In narrative terms, these strategies represent an attempt

at **Repair** that is only partially successful – students can manage the immediate challenge of finding accommodation, but they cannot eliminate the underlying housing shortage.

Coping with Curriculum Issues

Students developed multiple strategies for managing the demands of an overloaded curriculum. The most commonly reported strategy was **extended study hours**:

"I extend the hours of study. Waking up every night for studies can really help to catch up with school work." (BM3)

"Resorts to studying long hours and cutting out on some social activities." (BM5)

Another student explained:

"I reduce time on social life (sports, face book etc)." (AM26)

Some students reduced sleep to accommodate academic demands:

"Reduced sleeping time to 4 hours." (B8)

While these strategies demonstrate **commendable dedication**, they also raise serious concerns about **sustainability and well-being**. Chronic sleep deprivation is associated with reduced cognitive function, impaired memory consolidation, and increased susceptibility to illness (Walker, 2017). Students are essentially **sacrificing their health** to meet curriculum demands, which represents a **Repair** strategy that may ultimately undermine the long-term well-being that the programme is intended to foster.

Other students developed **collective coping strategies**:

"Formed study groups to explain concepts." (FMB13)

"Explaining studied content to friends to aid retention." (FMB17)

Study groups represent a **socially embedded** form of coping that leverages collective resources and peer support. In Todorov's terms, this represents a **more effective Repair** strategy because it not only addresses the immediate academic challenge but also builds social capital and collaborative skills that will benefit students in their future teaching careers. The quotation "explaining studied content to friends" is particularly significant because it reveals that students are not merely **passively receiving** information but are **actively constructing** meaning through peer teaching – a process that itself mirrors effective pedagogical practice.

The use of online resources was also reported:

"Using Google to understand concepts; downloading updated books." (FMB14)

"Watching tutorial videos." (FMB10)

"Reading widely and downloading tutorial videos." (FMB8)

These digital strategies demonstrate **technological savviness** and resourcefulness, particularly in response to inadequate library resources. However, the effectiveness of these strategies is contingent on internet connectivity – a resource that students themselves identified as inadequate. In narrative terms, the use of online resources represents a **Repair** attempt that is partially constrained by the very infrastructure challenges it seeks to overcome. The **Recognition** that updated books are not available in the library has prompted students to seek alternatives, but these alternatives are not equally accessible to all students, potentially exacerbating existing inequalities.

Additional coping strategies are summarised in Table 2.

Table 2: Additional Coping Strategies for Curriculum Issues

Code	Coping Strategy
CF45	Attending classes that are more demanding
FMB13	Formed study groups to explain concepts
B5	Study to pass exams during term; study to understand during holidays
B8	Studying for extended hours
B10	Reduced sleeping time to 4 hours
CH4	Following course outlines and researching before lectures
FMB8	Reading widely and downloading tutorial videos
FMB10	Watching tutorial videos
FMB12	Reduced sleeping hours to accommodate workload
FMB14	Using Google to understand concepts; downloading updated books
FMB20	Attending one lecture per week per course; copying notes
FMB23	Collecting notes and consulting lecturers individually
FMB17	Explaining studied content to friends to aid retention
FMB9	Developed courage to consult lecturers despite perceived meanness
FMB6	Finding lecturers and classmates to catch up on missed lectures

Coping with Learning/Teaching Facilities

Students developed strategies to compensate for inadequate resources (Table 3).

Table 3: Coping Strategies for Learning/Teaching Facilities

Code	Coping Strategy
BF8	Going early for experiments
BM13	Preparing in advance for upcoming academic years
AM20	Using Wi-Fi to download materials
AF29	Getting notes from peers with smartphones
B7	Waking up early to sit in front and follow lectures
CH1	Following up lecturers in their free time
CH5	Engaging in study groups

These strategies represent resourceful responses to resource constraints. The need to "go early for experiments" to secure access to limited laboratory equipment represents an additional burden on students' time and energy. The use of peers' smartphones to access notes represents a technological strategy that leverages peer networks. The need to "wake up early to sit in front" reveals that resource constraints affect not only the quality of education but also the learning environment. In narrative terms, these strategies represent attempts at **Repair** that are only partially successful – students can manage the immediate resource constraints, but they cannot eliminate the underlying resource shortages.

Coping with Transitioning Issues

Students developed strategies to manage the transition from secondary to university:

"I study whichever courses done previous academic years so that there is continuity." (CM4)

"I associate with friends who used to carry out these equipment's. This could help improve performance." (AM14)

These strategies represent **Recognition** of the transition challenge and active efforts to address it. The strategy of studying previous years' courses to maintain continuity demonstrates proactive learning beyond the formal curriculum. The strategy of associating with friends who have prior experience with laboratory equipment leverages peer knowledge to compensate for gaps in prior training. In narrative terms, these strategies represent effective **Repair** of the transition disruption, enabling students to adapt to the demands of university education.

DISCUSSION

The findings of this study offer a rich, multi-layered account of the student teacher experience, revealing a complex narrative of expectations, disruptions, and adaptations. Through the lens of Todorov's Narrative Structure Theory, we can understand the student journey not as a static collection of experiences but as a dynamic, unfolding story in which students move through phases of **Equilibrium** (initial expectations and benefits), **Disruption** (challenges), **Recognition** (awareness of impact), **Repair** (coping strategies), and ultimately a **New Equilibrium** (persistence and transformation). This narrative framing is particularly valuable because it reveals how challenges are not merely obstacles to be eliminated but are integral elements of a transformative story that shapes professional identity. In the following discussion, we interpret each component of this narrative journey in relation to existing literature and consider the implications for policy and practice.

Perceived Benefits

Research has demonstrated that teaching quality and school leadership are the most important factors in raising student achievement (Mizel, 2010). Quality teaching from a cognitive resource perspective relates to the knowledge, beliefs, attitudes, and dispositions teachers bring into the profession (Wang et al., 2011). The findings indicate that students developed and improved their scientific knowledge and abilities through laboratory exercises and research components. This aligns with CDC (2013) emphasis on knowledge, skills, and values development.

Students reported broadened knowledge, enhanced conceptual understanding, and widened thinking capacity. The growth in positive values and self-worth is particularly significant, as teachers transmit values to their learners, and cannot transmit what they do not possess (Barni, Russo, & Danioni, 2018). This finding is consistent with the work of Mwanza (2020), who found that Zambian teacher education programmes contribute to the development of professional identity and self-efficacy among trainee teachers.

The acquisition of psychomotor and science process skills through vacation courses, laboratory work, and presentations is encouraging. The development of social skills including collaboration, cooperation, and accommodation of others' views aligns with 21st-century competencies. The influence of lecturer professionalism, particularly timekeeping, suggests that institutional culture shapes student ethos (Khan et al., 2016). This finding resonates with Chilufya's (2020) observation that the hidden curriculum in Zambian universities significantly shapes students' professional dispositions.

Challenges

Students reported that some lecturers lack effective teaching strategies, a finding consistent with research showing that trained lecturers perform better in content delivery (Farooq & Shahzadi, 2006; Naoreen et al., 2014). The use of projectors, while potentially beneficial, may be ineffective when lecturers move through content too quickly without ensuring understanding (Knill, 2007). This finding is particularly relevant in the Zambian context, where many lecturers in science disciplines have advanced degrees but may lack formal pedagogical training (Mwanza, 2020).

Financial challenges are endemic in higher education (Malamfu, 1998), with students burdened by tuition fees, accommodation costs, and other expenses. These challenges impede the acquisition of Pedagogical Content Knowledge (PCK) as students are preoccupied with financial concerns. Equalisation of financial support for full-time and part-time students is recommended (Lowe & Gayle, 2007), as financial well-being correlates with deep learning and engagement (Stanton et al., 2016).

The curriculum overload arising from courses across two schools (Education and Natural Sciences/Agriculture) creates timetable clashes and information overload. This resonates with Chen, Pedersen, and Murphy (2012), who found that information overload affects students differently. Students questioned the relevance of some courses to secondary school teaching, a concern also raised in this study of Zambian teacher education.

Inadequate learning resources—outdated library materials, insufficient laboratory equipment and chemicals, limited farm exposure, and poor internet connectivity—compromise the quality of education. These resource constraints affect the variety of learning activities and successful transitioning from secondary to university, consistent with Shabiralyani et al. (2015) on the importance of visual aids. The resource challenges at UNZA are reflective of broader systemic issues in Zambian higher education, where funding constraints have led to deteriorating infrastructure (Nyondo, 2019).

Institutional disturbances, including slow-downs and strikes, force lecturers to rush through content, compromising instructional design (Khalil & Elkhider, 2016). These industrial actions, often related to poor working conditions and delayed salaries, create an unstable learning environment that undermines the quality of teacher preparation.

Coping Strategies

Students adopted various coping strategies: adapting to lecturers' styles; starting small businesses and engaging in part-time work; extending study hours and reducing social activities; forming study groups; and utilising online resources. While these strategies demonstrate resilience, they also represent a drain on time that could otherwise be devoted to skill acquisition. The necessity of such coping mechanisms suggests systemic issues requiring institutional attention.

The use of online resources, while innovative, is constrained by poor internet connectivity, highlighting the digital divide in Zambian higher education. The formation of study groups reflects a collective approach to problem-solving that is characteristic of Zambian communal culture (Mwanza, 2020). However, the reduction of social activities and sleep to accommodate academic demands raises concerns about student well-being and the sustainability of such coping mechanisms (Stanton et al., 2016).

Applying Todorov's Narrative Structure: A Theoretical Interpretation

The findings of this study can be understood through the lens of Todorov's Narrative Structure Theory, as illustrated in the following synthesis:

Equilibrium: The Ideal State

Students initially enter the programme with positive expectations of acquiring scientific knowledge, developing teaching skills, and achieving a professional qualification. The benefits they report – knowledge acquisition, skill development, and growth in values – represent the **Equilibrium** that the programme is intended to provide. This equilibrium is consistent with the national curriculum goals of developing knowledgeable, skilled, and values-driven teachers (CDC, 2013). The strength of this equilibrium is crucial because it provides students with the motivation and resilience to withstand subsequent disruptions. Students who perceive significant benefits are more likely to persist through challenges, as the benefits provide a counter-narrative to the difficulties they encounter.

Disruption: The Forces of Instability

However, this equilibrium is threatened by multiple, interconnected disruptions. Pedagogical challenges (inappropriate teaching strategies), financial constraints, accommodation shortages, curriculum overload, and resource inadequacies collectively create a **narrative of struggle** that threatens to derail students' educational journeys. These disruptions are not experienced in isolation but as a **cumulative burden** – the financial constraints, for example, are exacerbated by accommodation shortages, which are in turn compounded by curriculum demands that require time and energy that financially stressed students cannot afford. The disruption

is therefore a systemic phenomenon, rooted in institutional and policy contexts rather than individual student failings.

Importantly, the students' narratives reveal that they do not passively accept these disruptions but actively recognise them. The Recognition stage is evident in students' detailed accounts of how challenges have affected their academic performance, well-being, and career aspirations. This recognition is a necessary precondition for the repair stage – students cannot develop coping strategies unless they have first understood the nature and impact of the challenges they face. The sophistication of students' recognition – their ability to articulate not just the existence of challenges but their systemic interconnections – is a testament to their metacognitive development.

Repair: The Response to Disruption

Students respond to disruptions with a range of coping strategies, both individual and collective. These strategies – extended study hours, study groups, part-time work, use of online resources – represent the Repair stage, where students attempt to restore equilibrium. These strategies demonstrate agency and resilience – students are not passive victims of their circumstances but active agents in shaping their educational experience. However, the repair is often partial and unsustainable. Extended study hours and reduced sleep come at the cost of health and well-being. Part-time work comes at the cost of study time. The coping strategies, while demonstrating resourcefulness, also reveal the limitations of individual responses to systemic problems. Students can repair the damage to some extent, but they cannot address the root causes of the disruption – these require institutional and policy-level interventions.

New Equilibrium: The Transformed State

The ultimate outcome of this narrative journey is a **New Equilibrium**. Students who persist through the programme, despite the disruptions, emerge not merely with the knowledge and skills they originally expected but with a transformed understanding of themselves and their profession. The New Equilibrium is characterised by:

1. **Enhanced resilience** – students have developed coping strategies that will serve them in their future teaching careers.
2. **Realistic expectations** – students have moved beyond idealised notions of teaching to a more grounded understanding of the profession's challenges.
3. **Strengthened professional identity** – students who have navigated adversity may develop a stronger commitment to teaching, having persisted through significant challenges.
4. **Adapted competencies** – students have developed competencies (e.g., time management, financial literacy, collaborative skills) that go beyond the formal curriculum.

The New Equilibrium is not a simple return to the original state but a **transformation** – a narrative arc in which the protagonist (the student) is changed by the journey. As one student noted, the training has made them "strong, focused and determined" – qualities that may be more valuable than any specific content knowledge.

Theoretical Contributions and Implications

This application of Todorov's framework makes several contributions to the literature. **First**, it provides a coherent, process-oriented account of the student experience that moves beyond simple lists of benefits and challenges. **Second**, it reveals the interconnected nature of challenges – disruptions do not occur in isolation but interact and compound over time. **Third**, it highlights student agency – students are not merely recipients of education but active agents who recognise challenges, develop coping strategies, and construct meaning from their experiences. **Fourth**, it raises critical questions about the limits of individual coping – while students demonstrate resilience, the necessity of such coping strategies suggests systemic issues that require institutional

attention. Fifth, the framework reveals that the student journey is not a linear progression but a dynamic, dialectical process in which challenges and responses interact to produce a transformed outcome.

This theoretical lens also has practical implications. By understanding the student journey as a narrative arc, institutions can identify critical points where interventions may be most effective. For example, the Recognition stage is a crucial point for intervention – if students can be supported to recognise and articulate their challenges, they may be better able to develop effective coping strategies. Similarly, the Repair stage is an opportunity for institutional support – rather than leaving students to develop coping strategies on their own, institutions could provide structured support (mentorship, financial counselling, academic advising) that enhances students' capacity for repair.

CONCLUSION AND RECOMMENDATIONS

Conclusion

This study has explored the perceived benefits, challenges, and coping strategies of science teacher trainees at the University of Zambia through the lens of Todorov's Narrative Structure Theory. The findings reveal that students' experiences constitute a complex narrative journey – from an initial Equilibrium characterised by positive expectations and perceived benefits, through a series of Disruptions (pedagogical, financial, structural, and resource-related challenges), to a Recognition of the impact of these challenges, Repair through adaptive coping strategies, and ultimately a New Equilibrium marked by persistence, resilience, and transformed professional identity.

Students reported significant benefits in knowledge, skills, and values, aligned with national curriculum goals (CDC, 2013). However, substantial challenges – overloaded curricula, inappropriate pedagogical strategies, financial constraints, accommodation shortages, inadequate resources, and transitioning difficulties – compromise the quality of teacher training. These challenges, particularly when combined, erode students' time for developing essential Pedagogical Content Knowledge. The coping strategies employed by students, while demonstrating resilience, suggest systemic issues requiring institutional and policy attention. Critically, the narrative lens reveals that students are not passive recipients of these challenges but active agents who recognise disruptions, develop coping strategies, and construct meaning from their experiences. However, the necessity of such coping strategies – particularly the sacrifice of health and well-being through reduced sleep and extended study hours – raises serious questions about the sustainability of current programme structures and the extent to which the New Equilibrium represents a genuine transformation or merely a temporary accommodation to systemic problems.

The high attrition rate from first to fourth year may be partially attributable to these documented challenges, though this study did not directly investigate attrition. Future research should examine the relationship between the disruptions identified here and students' decisions to persist or withdraw from the programme. The narrative framework also highlights that the student journey is not a linear progression but a dynamic, dialectical process in which challenges and responses interact to produce a transformed outcome – an insight that has significant implications for programme design and student support.

Recommendations

Based on the findings, the following recommendations are made:

A. Immediate (Within 1 Year)

1. **Pedagogical Improvement:** The university should establish a mandatory pedagogical training programme for all lecturers, particularly those from Natural Sciences and Agriculture who may lack formal teaching qualifications. Quality over quantity of content coverage should be emphasised.

2. **Curriculum Coordination:** The three collaborating schools (Education, Natural Sciences, and Agriculture) should coordinate timetables to minimise course clashes and review the curriculum to remove redundant or irrelevant courses.
3. **Mentorship Programmes:** Deliberate mentorship programmes should be established to help students from diverse backgrounds adapt to university life, with senior students paired with incoming students.

B. Medium-Term (1-3 Years)

4. **Financial Support:** The university should explore more flexible payment schemes and enhanced financial support mechanisms to reduce students' financial worries and allow focus on academic development.
5. **Infrastructure:** Internet connectivity should be improved, and library resources should be updated to facilitate access to current learning materials.
6. **Enrolment Management:** The university should enrol numbers commensurate with available infrastructure to avoid overcrowding and ensure quality training.

C. Long-Term (3+ Years)

7. **Continuous Professional Development:** Regular CPD programmes should be established for lecturers, particularly those without formal pedagogical training, to ensure sustained improvement in teaching quality.
8. **Policy Review:** The Ministry of Education should review teacher education policies to ensure alignment between programme design and the realities of Zambian secondary schools.

Suggestions for Future Research

1. Determine the type and depth of knowledge acquired and how it aligns with national goals and aspirations.
2. Investigate the causes of high attrition rates from year one to year four to inform retention strategies.
3. Examine the pedagogical skills and lesson presentation of lecturers without formal training in pedagogy.
4. Conduct a comparative study across Zambian universities to identify best practices in science teacher education.
5. Explore the long-term impact of these training experiences on graduates' effectiveness as teachers in Zambian secondary schools.
6. Investigate the specific experiences of female students in science teacher education to understand and address gender-based barriers.
7. Conduct a longitudinal study tracking students from entry through graduation to capture how perceptions evolve over time.

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