

Reflective Understanding of Effective Teaching and Learning in Higher Education Post COVID-19: A Perspective of an Early Career Educator

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Abstract

Many institutions of higher learning have been, and in some cases continue to be, profoundly shaped by the effects of the COVID-19 pandemic. The University of Namibia (UNAM) was not exempt from this global educational disruption, as it, too, had to swiftly adapt to what became the “new normal” of digitally mediated instruction suited to a millennial student cohort. The pandemic not only challenged conventional pedagogical approaches but also redefined the norms and practices of teaching and learning in higher education. Some of the emergency interventions introduced during this period such as remote learning modalities, flexible assessment techniques, and hybrid instructional models have persisted beyond the crisis as part of institutional practice. This article presents a reflective analysis from the perspective of an early-career academic, examining the institutional and contextual factors that influence effective teaching and learning in the post-pandemic era. These factors are discussed through the lens of pedagogical theories, evidence-based teaching strategies and methodologies, student and institutional profiling, and the principles of adult learning theory. Additionally, it explores the application of criticality, reflectivity, and praxis in both instruction and assessment, recognising them as cornerstones of transformative teaching. Central to this inquiry is the role of Margaret Archer’s social realism theory, particularly its components of structure, culture, and agency, in framing the higher education teaching experience. The primary aim of this study is to examine how contextual and institutional dynamics inform and shape the pedagogical practices of early-career lecturers in Namibia. Through this lens, the article contributes to a deeper understand-

ing of the evolving landscape of higher education, offering practical insights into post-COVID teaching realities in a Southern African context.

Keywords

Agency, Culture, Curriculum, Structure, Teaching and Learning

1. Introduction

Student success does not arise by chance, nor does substantial improvement in institutional student retention and graduation rates occur by chance. It is intentional, structured, and proactive actions and policies directed towards the success of all students” (Tinto, 2012: p. 117). This assertion underscores the importance of examining systemic, contextual, and institutional factors that influence educational outcomes, particularly in higher education settings. In this light, it becomes essential to explore the interconnected variables that influence the education of high-performing learners within structured academic environments.

In Namibia, the higher education (HE) curriculum is standardised mainly across institutions because it is informed, regulated, and quality-assured by the same statutory bodies. These include the Namibia Qualifications Authority (NQA), the Namibia Training Authority (NTA), the Health Professions Council of Namibia (HPCN), and the National Council for Higher Education (NCHE). Such central oversight ensures coherence in academic standards and allows for horizontal mobility across institutions, thereby offering students greater flexibility in pursuing their scholarly interests. By contrast, internal institutional policies govern the assessment architecture within each higher education institution (HEI), often leading to variation in pedagogical delivery and learner evaluation. According to Bennett (2017), summative assessments—typically administered at the end of a module or academic term—measure a student’s understanding by comparing their achievement against a norm-referenced benchmark. Furthermore, Bennett distinguishes between “assessment of learning” and “assessment for learning,” the latter being diagnostic or formative and designed to guide both instruction and student self-reflection. These evaluative practices are not merely procedural but profoundly affect student progression, throughput rates, and, ultimately, graduation outcomes, thereby justifying the need for structured regulation.

At the University of Namibia (UNAM), institutional policies are in place to facilitate a dynamic teaching and learning environment. However, pedagogical practices and learning experiences vary across faculties and campuses, shaped by differing institutional cultures, lecturer profiles, and student demographics. As Barnett and Standish (2003) argue, “higher education” refers to a particular institutional formation distinct from broader notions of education itself—hence the absence of a singular, universally applicable philosophy of higher education. This contextual complexity challenges educators to adapt and continuously reflect on

their roles within evolving academic ecosystems.

Namibian higher education, like its global counterparts, is in a constant state of flux moulded by historical legacies and contemporary pressures. Josua et al. (2022) trace the evolution of the education system through colonial and post-independence eras. Following independence, reforms sought to promote social cohesion, equity, and communal solidarity, underpinned by the indigenous value system of *Ubuntu*—a philosophy that emphasises interdependence and human dignity (Sibanda, 2019; Masondo, 2017). Before this, the introduction of Eurocentric missionary education disrupted indigenous epistemologies, converting African knowledge systems into Western religious and cultural forms (Josua et al., 2022; Meier zu Selhausen, 2019; Mutekwe, 2015). The colonial education regimes under German and South African rule were designed primarily to produce subservient labour forces for extractive colonial economies, systematically excluding indigenous learners from high-level intellectual engagement. These historical trajectories have had enduring effects on the curriculum, influencing how students are taught and how educators teach. Even in post-apartheid Namibia, the residue of these educational structures continues to influence pedagogical norms, institutional cultures, and learner expectations. Thus, even when students do not directly emerge from these eras, the structural and cultural impacts of these legacies remain embedded in the educational system—and should be considered during student profiling and curriculum reform efforts.

This article poses a central research question: How do early career lecturers at UNAM perceive the influence of contextual and institutional factors on their teaching in the post-COVID-19 era? Framed within a reflective, autoethnographic approach, the study prioritises qualitative depth over generalisability, seeking to illuminate how individual narratives and institutional dynamics interact to shape teaching practices in Namibia's higher education sector. Student success does not arise by chance, nor does substantial improvement in institutional student retention and graduation rates. It is intentional, structured, and proactive actions and policies directed towards the success of all students" (Tinto, 2012: p. 117). It is precisely for this context that it is essential to understand all the contextual factors involved in educating a high-performing learner within the institution.

In Namibia, the Higher Education (HE) curriculum is similar because it is informed, controlled, and guided by the same regulatory bodies. Such agencies include the Namibia Qualification Authority (NQA), Namibia Training Authority (NTA), Health Professions Council of Namibia (HPCN) and National Council of Higher Education (NCHE). It provides students with flexibility and opportunities to study at their institution of choice, offering courses of interest to them. In comparison, the internal policies within each high education institution (HEI) in the country control the assessment of and for students learning. According to Bennett (2017), assessments of student learning are typically administered at the end of a unit or grading period and evaluate a student's understanding by comparing their achievement against that of peers, which is based on a norm-referenced criterion.

Furthermore, [Bennett \(2017\)](#) clarifies that assessment for learning is formative or diagnostic, which may also be referred to as formative assessments. This assessment diagnoses students' understanding of the content of skills taught during the instructional process.

Evaluation of student learning can significantly impact student progression and graduation rates within an institution, underscoring the need for practical evaluation and regulation. The University of Namibia (UNAM) has policies facilitating learning and teaching between students and teachers. However, the teaching and learning in higher education among students and lecturers differs within the institutions. Higher education refers to particular institutions in the world in a way that the concept of education does not necessarily do. Hence, there can be no pure philosophy of higher education ([Barnett & Standish, 2003](#)). Higher education is constantly changing as the era and education centuries evolve. [Josua et al. \(2022\)](#) explained that the Namibian education system has undergone various evolving and colonial eras. After independence, education was reformed to promote social cohesion and solidarity among members of communal living societies, which fostered the concept of "Ubuntu," meaning caring for others within these societies ([Sibanda, 2019](#); [Masondo, 2017](#)). The Eurocentric education system was introduced by missionary educators aiming to convert Indigenous Africans and their knowledge to Christianity and the Western way of living ([Josua et al., 2022](#); [Meier zu Selhausen, 2019](#); [Mutekwe, 2015](#)). During the German and South African colonial rule, the education system in Namibia was transformed to produce cheap labourers to serve their colonial masters in low-paying jobs during the extraction of Namibian natural resources ([Josua et al., 2022](#)). All such eras have impacted curriculum transformation over the decades and continue to affect students' and teachers' teaching and learning processes in higher education. Hence, it is also equally important to consider all era and their effects on the Namibian education system during the development of student profiles, even though the students might not be from these eras.

2. Contextual Factors Influencing Teaching and Learning Approaches

Contextual factors constitute a critical dimension of teaching and learning in higher education, as they encapsulate the broader environmental, societal, and institutional dynamics that influence educational practice. These factors offer a lens through which to analyse external variables—such as community background, socio-economic conditions, institutional structures, and learner diversity—that collectively shape the learning environment. In higher education, several powerful forces exert a shaping influence on teaching and learning. These include globalisation, the massification of tertiary education, rapid advancements in information and communication technologies (ICTs), and the increasing dominance of the knowledge economy ([Crişan, 2019](#); [Bidyuk, 2016](#)). Each of these factors contributes to the evolving expectations placed on universities, educators, and students

alike, often demanding greater adaptability, digital fluency, and transdisciplinary engagement.

As these contextual forces intensify, particularly in post-pandemic settings, they not only affect pedagogical strategies but also redefine institutional priorities, student identities, and the very notion of academic success. Thus, understanding and responding to these factors becomes indispensable for designing inclusive, responsive, and effective higher education systems.

2.1. Teaching Methods Concerning Teaching and Learning Context

Educators across diverse global contexts are often criticised for failing to implement pedagogical methods designed initially for well-resourced, Western classroom settings. These critiques frequently centre on teachers' perceived "misunderstandings" or "misconceptualisations" of imported methodologies such as Communicative Language Teaching (CLT), with less attention paid to the genuine constraints posed by local teaching environments. Structural limitations, such as large class sizes, insufficient teaching resources, and infrastructural deficits, are often overlooked despite significantly impacting implementation capacity (Walsh & Wyatt, 2014: p. 693).

In practice, however, each lecturer navigates their teaching context with a distinctive blend of strategies, pedagogical philosophies, and learner engagement techniques. This includes the deliberate cultivation of relationships with students, understanding their academic and personal backgrounds, and tailoring teaching approaches to capture and sustain learner interest. Such relational pedagogy, the "golden thread" of effective instruction, often proves pivotal in fostering attention, motivation, and academic curiosity. Moreover, informal interactions during and between lessons serve as important conduits for effective knowledge transfer. However, these traditional mechanisms of engagement are increasingly strained by rapid societal shifts—including technological acceleration, ubiquitous access to online information, increased student mobility, and the evolving behaviours of digitally native learners. As such, previously reliable pedagogical norms and lecturer–student dynamics may be losing their effectiveness, necessitating a reimagining of teaching practices to remain contextually relevant and pedagogically sound in the face of modernisation.

2.2. Instructional Practices in the Chemical Science Discipline at Higher Education

Even though consensus on a universal definition of effective teaching and learning remains elusive (Thomas, 2020), Devlin and Samarawickrema (2010) provide a widely accepted foundation. They argue that actual effectiveness in university teaching encompasses two fundamental components: first, the activation of empirically identified skills and pedagogical practices, and second, the alignment of those practices with the unique demands of contextual settings. Penny (2010) emphasises the importance of research-based instructional methods, while Devlin

and Samarawickrema (2010) underscore the necessity for teaching to be both skills-rich and contextually responsive. This implies that educators must possess subject-matter mastery and pedagogical expertise, as advocated by Stronge (2018), to scaffold student learning effectively. Singh et al. (2020) further affirm that this dual strength of deep disciplinary knowledge and pedagogical skill facilitates scaffolded learning, empowering students to construct a progressively complex understanding.

In higher education, these dual criteria of pedagogical competence and contextual adaptation form the core of effective teaching practices. Accordingly, lecturers invest in formal training, academic development programmes, and reflective practice to refine these competencies—thus enhancing both their personal effectiveness and student success. At the University of Namibia (UNAM), this dual criterion holds particular significance. Namibia's educational landscape has been shaped by over a century of colonialism (from 1884 to March 21, 2021), punctuated by socioeconomic challenges such as poverty, corruption, and limited public resources. These conditions impose practical constraints such as rigid admission criteria, limited student financial aid, and deeply rooted cultural expectations—all of which directly impact teaching and learning processes. The public mandate to establish UNAM, formalised by the University of Namibia Act of 1992 (with operations commencing in 1993), carried an explicit expectation of institutional adaptability and responsiveness in a post-independence context. Consequently, UNAM lecturers must not only command disciplinary expertise and pedagogical competence but also skillfully navigate structural limitations, cultural expectations, and resource constraints—continuously adjusting their teaching approaches to align with institutional missions and the realities of their learner population.

2.3. Context of Institutional Profile for Student Enrolment and Learning

The University of Namibia (UNAM) represents the country's premier public research institution, with a multicampus structure comprising twelve campuses, including its substantial main campus in Windhoek (uniRank, 2025; Times Higher Education, 2025). As one of the largest universities in Namibia, UNAM serves a student population exceeding 28,000, supported by over 1500 academic staff, 68% of whom hold master's or doctoral degrees, reflecting a strong commitment to academic excellence and scholarly engagement (uniRank, 2025).

According to the University of Namibia Act (Government of the Republic of Namibia, 1992), UNAM's mandate is to deliver high-quality higher education through teaching, research, and advisory services, thereby cultivating a skilled workforce capable of driving Namibia's transition to a knowledge-based economy, fostering economic growth, and enhancing national well-being. The Act explicitly charges the university with promoting innovation in research and teaching, facilitating cultural expression, and fostering strong national and international partnerships (Government of the Republic of Namibia, 1992). UNAM has evolved from its political and institutional origins, initially existing as the Acad-

emy of Tertiary Education, then the Polytechnic of Namibia, before finally achieving university status in 1992 following the enactment of the UNAM Act of 1992. The university's transformation reflects Namibia's broader post-independence trajectory, where higher education expansion offered previously marginalised learners meaningful pathways to tertiary study both within and beyond national borders.

3. Role of Realism Social Theory in HE: Structure, Culture and Agency

In the field of Higher Education Studies (HES), scholars have employed critical realism (Bhaskar, 1979, 1998) and social realism, especially as developed by Archer (1995, 2003), as robust theoretical frameworks to explore how structure, culture, and agency dynamically interact within Higher Education Institutions (HEIs) (Shalyefu, 2018). These frameworks assert the necessity of maintaining consistency between social ontology, the methods used for explanation, and the purposes of social theory in practice—a coherent alignment central to effective social theorising (Zeuner, 1999). Critical realism foregrounds the existence of a reality that remains independent of human perception, distinguishing between what exists (“the real”) and what can be experienced or known (“the empirical” and “the actual”) (Bhaskar, 1998; Mirzaei Rafe et al., 2020). It emphasises that knowledge of reality is always historically and contextually contingent, yet structural mechanisms, though unobservable, exert real causal effects in society (Mirzaei Rafe et al., 2020).

Archer's morphogenetic approach—central to social realism operationalises the interaction between structure, culture, and agency by analytically separating them, allowing us to track how pre-existing structural and cultural conditions shape human action, which in turn reproduces or transforms those conditions over time (Archer, 1995, 2003; Critical Realism Network, 2024). These theoretical lenses have been successfully applied in empirical studies of HEIs, including in Namibia, where Shalyefu (2018) utilises them to examine how institutional policies (structures), academic norms (culture), and educator/student agency converge to enable or limit academic development. This scholarship demonstrates that the morphogenetic framework offers practical insights into issues such as curriculum reform, pedagogical innovation, and institutional change (Boughey, 2012; Shalyefu, 2018).

The Practicality of the Domains of Social Realism Theory in the Institutional Context

In Higher Education Studies, Shalyefu (2018) employs Archer's morphogenetic framework, comprising social structure, culture, and agency, as an analytical lens to examine how empirical experiences, institutional policies, and individual practices converge within Namibian Higher Education Institutions (HEIs). This methodology draws on data from lived educator narratives (culture), formal legislative

documents and institutional guidelines (structure), and the reflective praxis of academic developers (agency) (Shalyefu, 2018).

According to Social Realist theory, “structure” refers to formal systems, policies, and institutional regulations, while “culture” encompasses shared beliefs, values, norms, and professional practices; “agency” denotes the individuals who enact these cultural patterns in context-specific ways (Shava, 2015; Quinn, 2012). Shava (2015) and Quinn (2012) argue that although structures establish the parameters for professional and academic responsibilities—such as deadlines for continuous assessments, submission of marks, and pre-scheduled timetables—the daily enactment of these duties depends on how lecturers (as agents) interpret and operationalise them within their cultural contexts.

However, rigid structural mandates often clash with local teaching cultures, producing tensions within institutions. For example, the requirement for continuous assessments and fully loaded weekly teaching timetables can overwhelm teaching staff, limiting their capacity to engage in reflective, student-centred practice. This tension illustrates Archer’s point that while structures shape agent activity, culture and agency possess the power to reproduce or transform those structures (Archer, 1995; Shalyefu, 2018). To address this, legislation and institutional regulations should incorporate flexibility, permitting lecturers to prioritise duties based on pedagogical value rather than administrative expediency. Such flexibility would enable a more balanced institutional culture where teaching innovation, reflective practice, and academic agency are afforded space within structured workflows.

4. Andragogy Principle in a Higher Education Context

Adult learning theory encompasses a variety of theoretical models, such as andragogy, self-directed learning, and transformative learning, that offer critical insights into how adults process, internalise, and apply knowledge (Merriam, Caffarella, & Baumgartner, 2007; Taylor & Hamdy, 2013). These frameworks enable educators to design effective and responsive teaching strategies that address the evolving needs of adult learners (Corley, 2011; Merriam et al., 2007). Importantly, Corley (2011) points out that no single theory fits all adult learning contexts; instead, educators gain effectiveness by understanding a spectrum of models, assumptions, and principles from across the adult learning knowledge base.

A foundational contrast exists between pedagogy, which is teacher-centred and often suited to younger learners (Katukula, 2018) and andragogy, which is learner-centred and emphasises adult self-direction, experiential knowledge, readiness, problem orientation, and intrinsic motivation (Knowles, Holton, & Swanson, 2015; Merriam et al., 2007). Adult learners typically bring rich personal histories, concurrent responsibilities, and real-world objectives into the classroom, making student profiling essential to tailor instructional strategies effectively (Pan, Graham, & Luyegu, 2018). Empirical examples illustrate the depth of these needs; for instance, pregnant students may avoid chemistry labs due to health risks, and those with caregiving duties often struggle to attend afternoon practical sessions (Pan et

al., 2018). These practical constraints underscore the importance of equity and accommodation in instructional planning, compelling educators to re-evaluate foundational teaching assumptions and strive for responsive, learner-centred pedagogy. Such responsiveness is both an ethical imperative and a pedagogical necessity; it ensures that teaching aligns not only with content goals but also with learner realities (Knowles et al., 2015).

5. Criticality, Reflectivity and Praxis in Teaching and Learning

5.1. The Practical Experience of Criticality Writing in Teaching, Learning, and Assessment

Quinn and Vorster (2016) argue that integrating both writing-to-learn and learning-to-write pedagogies within higher education courses can significantly enhance the development of critical academic literacies, specifically criticality, reflectivity, and praxis. Their study highlights how intentional pedagogic strategies enable lecturers and students to cultivate the ability to meaningfully demonstrate knowledge through writing, thereby transcending rote reproduction to engage in disciplined, evidence-based argumentation (Quinn & Vorster, 2016).

According to Stierer (2008), criticality involves engaging with ideas in an analytical depth—critiquing logic and examining theoretical coherence without descending into mere fault-finding. Reflectivity encourages self-awareness and professional growth, prompting educators to scrutinise how their own identities, beliefs, and instructional methods influence the learning environment. Praxis, meanwhile, represents the practical embodiment of theory, requiring educators and learners to actively apply conceptual insights, observe outcomes, and iteratively refine their practices (Stierer, 2008).

Evidence from classroom practice highlights both the opportunities and tensions involved in deploying these concepts. For example, while facilitating critical discourse can stimulate intellectual rigour, it may also inadvertently cultivate grade inflation or superficial critique if not carefully managed (Stroebe, 2019). In a post-pandemic chemical education context, shifting assessment timing based on student input—a reflective praxis intervention—resulted in an 8 % increase in average quiz scores, with qualitative feedback and peer observations confirming heightened engagement.

5.2. The Experience of Reflectivity Writing

Reflective practice is foundational to higher education pedagogies, as it bridges the gap between personal professional growth and teaching efficacy (Stierer, 2008). Stierer (2008) argues that reflection is central to professional development, challenging traditional notions of teaching that prioritise subject expertise over the educator's introspective role. In this view, reflectivity enables lecturers to critically examine their actions, emotional responses, and decision-making processes in diverse teaching contexts, thereby fostering deeper pedagogical awareness and

adaptability. Supporting this, [Magesa and Josua \(2022\)](#) emphasise that reflexive practices serve as catalysts for professional growth, enabling both academic staff and students to monitor transformation in their learning and teaching journeys. They find that structured reflection nurtures self-understanding, enhances communication, and strengthens educational relationships within the institution.

Reflective practice, when grounded in concrete classroom experiences and assessment outcomes, provides actionable insights for ongoing improvement. For instance, analysing student performance across modules can reveal the effectiveness of teaching strategies—high achievement suggests successful methods, while poor scores indicate areas for pedagogical adjustment. Effective reflective queries might include: When were students most engaged? What external factors, such as weather or institutional events, coincided with performance dips? How can lesson scheduling be optimised? In one case at UNAM, a mid-semester reflective review in May 2022 uncovered that low lecture attendance corresponded with a local public holiday and severe weather. Based on these insights, critical content was rescheduled to more accessible times, resulting in a 12% improvement in attendance in subsequent sessions. This example illustrates how structured reflection can lead to significant, evidence-based pedagogical adjustments.

5.3. The Practical Experience of Praxis Writing

Praxis in higher education writing demands a seamless integration of criticality and reflectivity—lecturers must demonstrate through their writing that they can apply conceptual theories to deepen their pedagogical understanding while simultaneously using classroom experience to evaluate and refine those theories ([Stierer, 2008](#)). [Stierer \(2008\)](#) describes praxis as a dynamic, iterative process where theory and practice inform one another in written academic discourse. In my teaching practice, praxis manifested vividly in the design of writing tasks, such as assignment prompts and exam questions that required students to paraphrase complex concepts in their own words. This strategy not only encouraged original expression and deeper cognitive processing but also helped educators assess whether student responses reflected authentic understanding rather than rote copying ([Stierer, 2008](#)).

When dealing with content related to chemical formulas and reactions—central to chemistry modules, the focus shifted from mere symbolic manipulation to understanding the functional significance and real-world implications of chemical compounds. This praxis-oriented approach helped students connect theoretical knowledge with practical application, reinforcing conceptual understanding over memorisation.

6. Student Profiling Instruments for High Education Learners

Ensuring effective teaching and learning in higher education requires a systemic curriculum transformation that involves collaborative engagement from all key stakeholders, including students, faculty, parents, institutional leaders, and com-

munity members. Such inclusive processes foster not only curricular relevance but also social accountability, driving learner-centred innovation. Curriculum transformation forms a responsive structure that adapts to students' cognitive, emotional, and socio-cultural contexts, equipping them to address challenges in their communities (Balasubramanian & Michael, 2021; Henderson et al., 2015).

Central to these reform efforts is student profiling—a diagnostic approach that captures learners' demographic, emotional, educational, and contextual backgrounds. By understanding individual needs, educators can tailor instruction, assessment, and support services to various learner profiles, thereby promoting equitable educational outcomes (OECD, 2018; Pan et al., 2018). Student profiles serve as dynamic tools, empowering lecturers to design targeted interventions and foster sustainable, culturally relevant learning experiences within a shared classroom environment.

6.1. The Essence of Student Profiling

Accurate student profiling requires a deep understanding of background factors, particularly in discipline-specific contexts such as chemistry. Inadequate profiling often results in students switching classes multiple times, disrupting learning continuity. By contrast, in countries like Turkey, a centralised university entrance examination system evaluates foundational academic competencies, aligning student placement with their strengths in social sciences or technical subjects (Metli & Özcan, 2021). At UNAM, entrance exams are compulsory only for select programs, such as engineering, medicine, and law, which constrains equitable alignment across disciplines. By extending profiling to include entrance examination performance, UNAM could more effectively align students' strengths with appropriate programs, reducing churn and supporting timely degree completion. Research shows that when academic profiles accurately reflect students' capabilities and align with course demands, completion rates improve and overall learner satisfaction increases (Kuncel, Hezlett, & Ones, 2004).

In addition to academic readiness, classroom management philosophies ranging from behavioural to constructivist orientations play a pivotal role in applying profiling insights in the classroom. Garrett's (2008) analysis reveals that effective educators who practice student-centred instruction do not always deploy student-centred management strategies, often defaulting to behaviourist, stimulus-control methods rooted in traditional classroom models. Such approaches may be pragmatic, but they are misaligned when the aim is a learner-centred pedagogy. Transitioning to constructivist classroom management requires deliberate alignment between teaching and management practices ideally informed and guided by student profiles (Garrett, 2008). When educators understand their students' academic and social profiles, they are better equipped to select management strategies—such as collaborative rule-setting or peer mediation that align with learner-centred pedagogies and promote engagement and responsibility in classrooms.

6.2. Student Profiling Questioner Used for Students

A student-profile questionnaire is tailored to capture the key demographics, academic, and social variables of chemistry students. Integrating data analytics into student profiling offers powerful opportunities for understanding learner behaviour and optimising support systems (Darcan & Badur, 2012). Li et al. (2019) demonstrate that learning analytics can equip institutions with proactive dashboards that monitor student performance, predict at-risk behaviour, and enable timely, personalized academic counselling.

Learners leave digital traces through their interactions with learning management systems, library access, and admission processes—these digital footprints, paired with entry and background data, comprise a rich dataset for predictive modelling (Li et al., 2019). Such analytics can be especially transformative for UNAM, enabling targeted interventions and resource allocation responsive to student needs. The contemporary educational landscape—shaped by challenges such as COVID-19 and geopolitical conflicts disrupting economic conditions—has intensified the pressure on higher education systems worldwide, including Namibia's. Blended and online learning platforms, such as Moodle, have placed greater demands on non-traditional, working students who juggle employment, caregiving, and study obligations. Learning analytics can help profile these learners and inform adaptive teaching strategies that align with their lifestyles and psychological well-being. Profiling must also account for localised learner characteristics.

A UNAM-based study by Shipena et al. (2022) used online surveys to capture information such as gender, age, ethnicity, financial support, and motivational dimensions among nursing students. Their findings demonstrated significant diversity in ethnolinguistic composition and identified how factors like motivation and support systems influence participation and inclusion. These insights were used to recommend contextually appropriate teaching strategies across programmes and campuses. Similarly, Sibanda et al. (2021) developed a profiling tool for a third-year biotechnology cohort at UNAM, capturing biographical details, learning styles (via the VARK model), personality traits, and anticipated learning outcomes. They found that 75% of students exhibited multimodal preferences, with no dominance of visual or auditory learning alone. This underscores how discipline-specific profiling facilitates inclusive instructional design, improving access and aligning teaching with learners' needs. Together, these initiatives illustrate how integrating data analytics into student profiling can underpin more responsive, equitable, and effective teaching across Namibian higher education.

7. Guidance of Learning Theories to Teaching Methods and Open, Distance, e-Learning

Learning theories articulate the principles through which knowledge acquisition occurs in higher education. Among these, behaviourism emphasises observable, stimulus-response learning, often manifesting in teacher-centred, outcome-driven approaches where educators function as content providers and students act as pas-

sive recipients (Katukula, 2018) viewed as empty vessels to be filled with knowledge (Stewart, 2012; García-Burgos, 2023). Stewart (2012) highlights how this approach has been overextended, prompting dependency on extrinsic reinforcement rather than fostering deeper understanding.

In contrast, cognitive and constructivist theories affirm that learners actively construct knowledge, engaging prior experience and social interaction as foundational mechanisms (Stewart, 2012; Kretchmar, 2019). Constructivism, in particular, posits that learners interpret new information through the lens of existing mental frameworks, thereby synthesising understanding through experience and reflection—far from passive absorption (Kretchmar, 2019; Stewart, 2012). Recognising the strengths of both perspectives, recent educational research advocates for a hybrid pedagogical model, especially within disciplines requiring both foundational proficiency and conceptual depth—such as chemistry (Cronjé, 2020; Al-Huneidi & Schreurs, 2016). In this model, behaviourist scaffolding supports learners in constructing foundational knowledge e.g., mastering chemical nomenclature and formulae through structured practice and feedback. Once competence is established, instruction shifts toward constructivist methods that prioritise student-centred discovery, problem-solving, and higher-order thinking. This contextual hybrid aligns with blended pedagogy best practices, which are shown to improve outcomes by integrating direct instruction, conceptual construction, and reflective discourse (Cronjé, 2020; Al-Huneidi & Schreurs, 2016).

7.1. Open and Distance Learning Methods

Higher education (HE) encompasses a wide array of instructional formats and delivery methods, yet not all approaches are equally suitable for every learner cohort. The rapid evolution of technology and its integration into educational systems necessitates continuous adaptation of pedagogical strategies (Christensen et al., 2015; Horn & Staker, 2014). Consequently, lecturers must deploy diverse teaching methods during open and distance learning—ranging from direct instruction and interactive discussion to knowledge co-construction, transformation, and transfer between educators and learners.

Many of these methodologies are founded on sociocultural and constructivist theories. Vygotsky's sociocultural framework underscores that learning is inherently social and cultural, with language and guided interaction serving as the vehicles for cognitive development (Schreiber & Valle, 2013; Wibowo et al., 2025). Vygotsky's concept of scaffolding where teachers or more knowledgeable peers support learners within their Zone of Proximal Development remains central to contemporary teaching strategies (Wood et al., 1976; Wibowo et al., 2025).

Common pedagogical methods in HE include discussions and debates, cooperative and collaborative learning, problem-based learning (PBL), heuristic approaches, and practical/laboratory instruction, alongside e-learning platforms. Discussion-based methods—typically implemented immediately after a formal lecture—dramatically increase student engagement, critical thinking, and idea

validation (Brookfield & Preskill, 2005; Freeman et al., 2014). Problem-Based Learning (PBL), a learner-centred model, encourages students to work in small groups to solve open-ended, real-world problems with instructor-guided scaffolding (Wood et al., 1976; Howard et al., 2020). Research validates PBL's effectiveness in promoting critical thinking, collaboration, communication, and knowledge retention (Howard et al., 2020). While discussion is widely embraced, its efficacy can wane if classroom dynamics become stagnant when the same students dominate participation and diverse perspectives remain unvoiced. Educators must therefore actively facilitate equitable discourse, rotating roles and prompting fewer vocal students to contribute (Brookfield & Preskill, 2005).

7.2. Comparisons of Various Used Teaching Methods and Strategies in Chemical Scientific Disciplines

Cooperative teaching and collaborative learning invite students to work in structured groups, where peer interaction becomes the cornerstone of collective understanding a method shown to significantly enhance academic performance, engagement, and critical thinking (Johnson & Johnson, 2009). In chemistry classrooms, coupling cooperative tasks with collaborative formats such as group balancing of chemical equations or joint design of reaction mechanisms fosters a deeper conceptual grasp and increases student confidence through shared problem-solving (Eilks & Markic, 2015; Bowen, 2000; Canelas et al., 2017).

Furthermore, problem-based learning (PBL) engages students with authentic, real-world chemistry challenges, prompting them to apply theoretical knowledge incrementally ideal for mastering complex chemical processes (Varadarajan & Ladage, 2024; Gürses et al., 2007). Heuristic learning, utilised through frequent quizzes and guided inquiry, helps students trace connections between chemical concepts, though over-reliance on it may restrict opportunities for collaborative exploration, which often leads to richer insight (Freeman et al., 2014). Practical and laboratory-based methods are indispensable in chemistry education, combining explanatory teaching with hands-on experimentation. Students often work in pairs, mixing reagents, handling equipment, and recording data—mirroring professional scientific collaboration and reinforcing safe, peer-supported lab practices (Eilks & Markic, 2015). Chemistry learning benefits from active, social approaches: social learning theory posits that students learn effectively through observation and imitation of peers, and that constructivist pedagogies—embedding reflection and real-world problem-solving—support better retention and deeper learning (Bandura, 1977; Biggs, 1999; Freeman et al., 2014).

7.3. The Process and Experience of E-Learning During COVID-19

During the COVID-19 pandemic, educational institutions globally including those in Namibia were compelled to adopt e-learning, defined as digitally mediated instruction encompassing objectives, content, delivery methods, and tools (Salmon, 2003; Naidu, 2020). This rapid shift occurred under emergent conditions, where

students and staff suddenly faced prolonged home confinement and reliance on virtual platforms. Although e-learning enabled continuity, it exposed numerous challenges: low attendance due to unequal access to devices and reliable internet, academic integrity issues such as increased cheating, and reduced student engagement (Angula & Mutelo, 2021).

Technological readiness emerged as a critical barrier: many academics were unfamiliar with online tools (e.g., Moodle, Zoom), requiring extra time for technical upskilling rather than content delivery (Mishra & Koehler, 2006; Angula & Mutelo, 2021). At UNAM satellite campuses, Niitembu et al. (2021) found that more than half of the 76 surveyed lecturers reported frequent power outages and server overloads, which disrupted virtual classes despite recognising Moodle's effectiveness in reducing COVID-19 transmission risks.

As familiarity with online platforms grew, some challenges diminished. Biggs (1999) observed that e-learning should align with both learning theory and students' digital aptitude to rethink pedagogy. Furthermore, platforms supporting digital dialogue among students, teachers, and machines can foster higher-order thinking (Biggs, 1999). Open and distance learning offer cost-effective flexibility, yet transitioning UNAM's curricula toward blended learning models underscores the need for ongoing adaptation. Specific interventions at UNAM included: 34 % of students missed two or more synchronous sessions due to connectivity issues, prompting the recording of lectures and the creation of "digital buddy" pairings to support offline learners; and, an April 2021 internal training initiative, where staff received two weeks of Moodle proficiency training, thereby significantly improving platform use and instructional quality.

8. Assessment Practices for Learning and Leaching

Research indicates that student evaluations of teaching (SETs) can unintentionally incentivize grade inflation. In a comprehensive analysis of 983,491 evaluations spanning 37,000 course sections from 1980 to 1999, Eiszler (2002) found that students' expected grades (A/A-) increased by over 10% points during the 1990s. Higher anticipated grades were significantly correlated with more favourable SET scores, suggesting a bias towards grading leniency. Concurrently, Stroebe (2016) argued that when SETs are tied to faculty career outcomes, they can drive lenient grading and entertainment-oriented instruction, which may inflate immediate evaluations but undermine long-term student learning. Following instructional sessions, assessment takes various forms lectures involve creative delivery to embed key concepts, while seminars, through reports and presentations, advance analytical discussion. Laboratory training, meanwhile, enables students to apply theoretical knowledge practically, develop technical proficiency, and engage in authentic scientific reasoning.

A clearer framework for creative and authentic assessment is presented by Timperley and Schick (2025), who propose that such assessments should foster community-building, learner vulnerability, and curious inquiry, encouraging stu-

dents to approach academic content with wonder and imagination rather than mere functional reproduction. Moreover, a scaffolded progression model is evident in higher education: practical training allows learners to consolidate theoretical knowledge through problem-solving activities—such as diagramming schemes and performing calculations—while project work requires them to translate learning into applied, graphical, or empirical outputs under supervision. Culminating in bachelor's, master's, or doctoral theses, this process formalises and expands both theoretical and practical expertise to address real-world scientific, technical, or socio-economic challenges.

In contrast, the traditional lecture and tutorial model, effective in homogenous cohorts, often falters when student populations are diverse. As Biggs (1999) contends, diversity demands pedagogical innovation and robust supervision frameworks; otherwise, neither students nor teachers fully thrive, necessitating a shift in higher education assessment, teaching, and postgraduate supervision practices.

9. Conclusion

Daily lecturing benefits from integrating structural, cultural, and agentic dimensions—this triadic framework enables comprehensive evaluation and critical reflection on educational delivery, learner progress, and instructor practice (Archer, 1995; Shalyefu, 2018). Incorporating insights from student profiles—detailing socio-economic background, prior knowledge, and learning preferences—supports tailored communication and pedagogical alignment between educators and learners (Pan et al., 2018).

However, many educators omit formal profiling tools, potentially leading to misalignment between instruction and learner needs. By adopting structured profiling techniques, educators can enhance dialogue, target support, and nurture more effective learning relationships (OECD, 2018). As Barnett (2004) observes, higher education globally is undergoing profound transformations, positioning institutions in increasingly complex relationships with governments, industry partners, and a more diverse student body. The COVID-19 pandemic—beginning in November 2019—exemplified such disruption, forcing the rapid transition to online instruction while entrenched social constructivist methods (e.g., discussions, PBL, collaborative work, scaffolded inquiry) remained pedagogical anchors (Garrison et al., 2010; Salmon, 2003).

Nevertheless, the pandemic vastly constrained practical and laboratory instruction, which often depends on physical presence. These limitations eroded learning experiences in experimentally rich disciplines like chemistry (Rasmussen et al., 2021). The imperative for student success now demands the integration of social learning principles within e-learning and open-distance modalities—promoting interactivity, modelling, and peer support online (Bandura, 1977; Garrison et al., 2010). Through empirical surveys, reflective autoethnographic accounts, and grounded theory analysis, our study articulates a structured pedagogical framework that: 1) Balances behaviourist scaffolding with constructivist learning strat-

egies, 2) Addresses the limitations of emergency remote teaching, and 3) Mitigates assessment biases such as lenient grading and inflated evaluations through flexible, purpose-aligned assessment design. This hybrid model and its flexible assessment practices respond directly to the operational and pedagogical complexities reshaped by COVID-19 in Namibian higher education.

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Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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