

Building Collaborative Learning Environments Through Conceptualization Approach

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The purpose of this concept paper on collaborative learning (CL) is to outline a conceptual framework for instructional techniques that can be used to encourage students to work together in solving complex academic tasks. It focuses on the value of teamwork and aligns with the principles of collaborative learning enshrined in the key strategic goals of many universities in South Africa. The paper provides the parameters within which collaborative learning at universities can be effectively implemented for the enhancement of students' academic achievement. The discussion encompasses a description of key contextual, epistemological, and pedagogical issues. It further covers the purpose and key principles of collaborative learning, and the integration of collaborative learning in teaching and learning practices using technology. These principles and parameters will inform universities' theory and practice of CL.

Key words: Higher education, teaching and learning, teamwork, Pedagogy

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Introduction

South African higher education academic discourses are undergoing a period of change. Thus, epistemological contestations have come at a time when the current curriculum is challenged to move away from a Eurocentric worldview and embrace practices that arise from African thought and values. It has been argued that many of the pedagogical approaches used in universities have their roots in epistemological positions developed by Western scholars. Some scholars (Motala et al., 2021; Waghid 2020; Maringe et al., 2021) have warned against an over-reliance on Western epistemologies alone. Waghid (2020) goes further in calling for the introduction of an African philosophy of higher education in teaching and learning which is underscored by *ubuntu*. For Waghid, *ubuntu* involves “engaging in deliberations with others so that humans in the community can come up with substantive solutions for particular societal problems” (p. 302). This resonates with CL. Given this understanding, constructivists reject teacher-centric pedagogies where the teacher is the holder and transmitter of knowledge and the student is a passive recipient. Furthermore, Fernando and Marikar (2017) argue from a constructivist perspective that learning is active; students have to make sense of their learning experiences so that learning is always socially and culturally mediated. These ideas resonate with Waghid's (2020) call to disrupt teaching and learning on the African continent through the application of the philosophy of *ubuntu*. Using *ubuntu*-based ideas of “autonomy to share”, “interconnectedness” and “co-belonging”, Waghid states that “following an *ubuntu* notion of co-belonging, teachers and students become co-investigators in pedagogical encounters...*ubuntu* is a form of decoloniality as it undermines racism, exclusion, humiliation and other forms of injustice”. (p. 306).

Garzon et al. (2020) have identified constructivism, in its various forms, as the most popular Western epistemological position from which several learning approaches derive, including collaborative learning, inquiry-based learning, project-based learning and situated learning. Although constructivism has its origins in the West, it lends itself to the *ubuntu* philosophy in education. Since constructivism and collaborative learning are understood in both settings, it is possible to draw insights from both Western philosophical positions and the African philosophy of *ubuntu* to come up with an eclectic, relevant and hopefully more powerful pedagogical orientation than is currently practised. When anchored in such a rich epistemology, CL can become a powerful platform for addressing many of the contextual imperatives outlined under Section 1.1. There are, however, other practical and compelling aspects of the epistemological basis of CL that need to be pointed out here. These include the critical notions of epistemic agency and dialogic pedagogy.

Students' epistemic agency

Although CL emphasises students collaborating among themselves and with their teachers, scholars (Ko & Krist, 2019; Miller et al., 2018; Motala et al., 2021) have highlighted the role of human agency and meaning-making in the process of learning. They use the term '*epistemic agency*' to denote two overlapping characteristics, namely, the social construction of knowledge and the co-investigation of topics by students in pedagogical encounters, as propounded by social constructivists. In other words, rather than memorising and reciting information transmitted by the teacher, students engage in meaning-making and develop a deep understanding of core ideas of the subject matter through their epistemic agency (Miller et al., 2018). In view of the centrality of this notion to real learning, it is proposed that within the CL framework, lecturers will create opportunities for students to exercise epistemic agency. This will allow students to affirm their humanity through autonomous engagement with subject matter, in the context of interconnectedness with others and a sense of belonging to a community of practice. For this to happen, appropriate pedagogies should be employed.

Dialogical and humanising pedagogy

Given the epistemic violence that post-colonial education has inflicted on students in South Africa, scholars have been in search of transformative pedagogies. CL is one such transformative pedagogy that not only promotes ubuntu but also provides epistemic access to what is being taught (Segal 2017; Shih 2018; Zembylas 2018; Motala et al., 2021). Motala et al. (2021) stress the need for students to be given epistemic access to knowledge and skills that will enable them to critique the lecturer and learning content. Shish (2017) extends Freire's (2000) notion of dialogic pedagogy by adding several propositions; two of these are that all voices matter, and that dialogue is a process of challenging domination. These two tenets illustrate relevant epistemological issues that currently colour the South African teaching and learning environment.

An integral part of dialogic pedagogy is what some scholars have termed humanizing pedagogy. This is a pedagogy in which students engage with lecturers and fellow students in mutual humanization through problem-posing and solving. Zembylas (2018, p. 5) states, "In the South African context, humanizing pedagogy has been embraced as a practice of facilitating dehumanization at schools and tertiary institutions in the aftermath of apartheid." Put differently, there is a need to use transformative pedagogies to address the pitfalls in the South African higher education system, in which there has been a systematic denial of students' epistemic access and agency, resulting in their dehumanization.

The contextual and epistemological issues outlined above offer a repertoire of concepts that enable one to consider critical pedagogies for transformative teaching and learning. These should form the basis of a meaningful conceptualization and practice of CL.

Purpose Of Collaborative Learning

Collaborative learning, according to Sumtsova et al. (2018), refers to "students' mutual (distributed) learning which encourages them to work together collectively, designing or 'producing' new scholastic attainments, rather than absorbing the knowledge provided by the instructor". The emphasis in CL is more on the process than the product of collaboration. This implies that students may need guidance and support if they are to cognitively benefit from participating in such activities (De Hei et al., 2020). If applied correctly, collaborative instructional approaches have the potential to enhance student participation, which can improve learning outcomes (Qureshi, Khaskheli, Qureshi, et al., 2021). Collaborative learning approaches are informed by the following assumptions about learning:

- Learning results from social interaction, where students work with others to integrate new information or ideas with what they already know, thereby creating something new (Smith & MacGregor, 1992; Qureshi et al., 2021)
- Learning happens when rich contexts are created to promote problem-solving and critical thinking (Smith & MacGregor, 1992; Zambrano et al., 2019; De Hei et al., 2020).
- Learning is a social activity involving the common pursuit of meaning-making (Smith & MacGregor, 1992).
- Learners are diverse and approach their work differently, as influenced by their multiple experiences and perspectives which enrich the learning process (Smith & MacGregor, 1992; Zambrano et al., 2019).

Exposing students to collaborative learning experiences should motivate and encourage their active engagement in the learning process. Correctly applied, CL will develop students' persistence, responsibility, and sensitivity as they "question, learn and understand" in collaboration with others (Smith & MacGregor, 1992 p. 10).

Institutions of higher education need to ensure that all students acquire relevant 21st-century skills to achieve real-world success. Binkley et al. (2012) identified critical 21st-century skills, clustering them into four groups:

- First, *ways of thinking* (e.g., creativity & innovation, critical thinking, problem-solving, decision-making, learning to learn and metacognition);
- Second, *ways of working* (e.g., communication and collaboration – teamwork);
- Third, *tools for working* (e.g., information literacy, ICT literacy); and
- Fourth, *skills for living in the world* (e.g., citizenship; life and career; personal and social responsibility).

The ability to work collaboratively with a team is a skill that serves students well beyond their studies, being a priority in the world of work. Thus, this concept paper will assist in the development of a collaborative learning framework to guide the operation, integration and implementation of CL and intentionally ground and strengthen CL in our practice.

There is a need for collaborative learning at the Universities to be effectively contextualised for the benefit of the university community, i.e., academics and students. Collaborative learning thrives in an environment where both academics and students are aware of the impact of their actions on the broader university community (De Hei et al., 2015). This underscores the call for curriculum transformation with an emphasis on the inclusion of African epistemologies which prioritise ubuntu. Lecturers' beliefs and values about teaching and learning play a significant role in the design and implementation of collaborative learning. This necessitates the provision of an institutional guide. In line with the teaching and learning strategy, collaborative learning provides a channel for enhancing the quality of instruction. This is achieved through the involvement of both lecturers and students in the knowledge production chain, the acknowledgement of prior knowledge, and the acceptance of individual values and diversity in the learning process. Collaborative learning can assist in developing students' cognitive abilities and social skills (La Rocca, 2014), which are an essential part of their graduate attributes.

Principles Of Collaborative Learning

Eight collaborative learning principles have been identified, as discussed below. The inclusion of these principles in teaching and learning practice will ensure that students effectively collaborate and that student-student interactions foster CL. The focus will be on the meaning, importance and practical implementation of each principle (Jacobs & Seow, 2015) as each seems most relevant to the Unizulu context. As presented by Jacobs and Seow (2015), the eight CL principles are heterogeneous grouping, teaching collaborative skills, group autonomy, maximum peer interactions, equal opportunity to participate, individual accountability, positive interdependence and cooperation as a value.

Heterogeneous grouping

Simply put, heterogeneous grouping is the principle that students should form collaborative learning groups with fellow students who are different from themselves. Research studies indicate that heterogeneous groups encourage students to see different perspectives and enable advanced students to mentor their peers, thereby setting the stage for a more harmonious society (Casey & Fernandez-Rio, 2019). In light of the university's goal to foster a more student-centered approach, lecturers are advised to discuss with students the potential benefits of heterogeneous grouping and to encourage them to form their own groups accordingly, rather than randomly assigning students to groups which may be a tedious process, especially considering large class sizes.

Teaching Collaborative Skills

This involves lecturers intentionally allocating lecture time to the teaching and learning of collaborative skills, getting students to practise them, and encouraging students to reflect on their performance. Soller (2001) suggests that when students use collaborative skills, their groups are likely to function better, leading to more productive learning and enjoyment of the learning process. In addition, the process inculcates skills that can be used throughout life and are highly relevant in all fields of work. Therefore, it is necessary that lecturers allocate instructional time to the development of these skills, then provide students with opportunities to practice them and reflect on well they did. Johnson, Johnson and Holubec (2007) offer a six-step procedure for practically teaching collaborative learning skills which may be considered in the Unizulu context.

Group Autonomy

Group autonomy encourages students to turn first to their fellow groupmates when they require assistance, clarity or feedback. For students to become lifelong learners, they need to take on some of the roles formerly seen as the exclusive domain of lecturers. Attempting to perform these roles will provide students with learning opportunities and promote valuable peer interactions. The literature on collaborative learning provides many different ideas for promoting group autonomy. This concept paper highlights only suggestions given by Jacobs and Seow (2015); lecturers are encouraged to consider these and others. For instance, groups can use the slogan, 'team then lecturer,' i.e., ask teammates before you consult a lecturer. Group autonomy is especially important in the online teaching environment, especially when students face difficulties with learning management systems; they can turn to their peers, as lecturers are less likely to be immediately available to aid all groups simultaneously.

Maximum Peer Interactions

This principle refers to maximizing two aspects of peer interactions, namely, quantity and quality. The *quantity* of peer interactions increases when group activities are used, particularly when the groups are kept small and sometimes report to other groups instead of or in addition to the entire class. The *quality* of peer interactions increases when

students use higher-order thinking skills (Chiang, et al., 2013). These thinking interactions promote more learning, greater depth of processing and greater engagement (Järvelä, Hurme & Järvenoja, 2011; Nussbaum, 2008). Thus, the greater the quantity of these quality peer interactions, the more productive the engagement. The learning management system also offers many innovative and engaging tools for peer interactions which lecturers may explore.

Equal Opportunity to Participate

This principle addresses situations where one or more group members attempt to dominate the group, denying others the chance to interact with the task and with their fellow groupmates. In such cases, and where excluded group members are less proficient at the task the group is undertaking, the other group members miss peer tutoring opportunities they would have had if everyone had been included. Regarding online teaching, the learning management system offers tools for providing all group members with equal opportunity to participate. More specifically, asynchronous online communication allows students to share their ideas without having to compete for a spot in the conversation. A method which promotes equal opportunity to participate is colour coding, where each person's contribution to a graphic, table or text is shown in a certain colour; another method is for the lecturer to randomly choose students to share their group's ideas. Lecturers would need to monitor the distribution and quality of interaction in their groups.

Individual Accountability

Individual accountability is the principle that requires some mechanism to be in place to ensure that each team member is responsible or accountable for their contributions. While equal opportunity to participate is the CL principle which seeks to offer all group members a chance to play important roles in their groups, individual accountability is the corollary; that all members need to hold all others to account for taking an active role and contributing. The literature on collaborative learning shows that both face-to-face and online interactions provide tools for promoting individual accountability. For example, groups may create a roster outlining members' roles, responsibilities and activities, and closely monitor progress. Lecturers can address the problem of inactive group members (essentially freeloaders) by involving peers in assessments, as peers are better placed to monitor each member's input. Students can also study together but be assessed individually.

Positive Interdependence

Positive interdependence encourages sharing among students. When all students in a group are positively interdependent, group outcomes are enhanced. Interdependence means that a group cannot complete a task without the contributions of all its members. It involves, in Jacob's (2006) words, a "feeling of one for all and all for one" (p.39). Whereas the principle of individual accountability places some pressure on group members to contribute to the group, positive interdependence provides support; thus, if students are having difficulties, their groupmates are there to help them. Positive interdependence can also promote motivation to learn because students are learning not just for themselves but also for the benefit of their group. A common example of a pedagogical task that includes positive interdependence is *jigsaw information-share*.

Cooperation as a Value

According to Jacobs and Seow (2015), the eighth principle builds on positive interdependence and seeks to spread the feeling of "one for all and all for one" beyond the small group to the entire class, the entire educational institution, the community, the nation and ultimately the world. This principle strongly correlates with our South African ubuntu philosophy. While students need to know how to compete and how to work alone, the hope embodied in the principle of cooperation is that students will come to a consensus on decisions and view cooperation as their preferred option for tasks. The approach ought to foster cooperation as a value, rather than competition and individualism. In the university's context, an example of the principle in operation is service-learning projects, in which students work together to provide a service while engaging in learning linked to their curriculum.

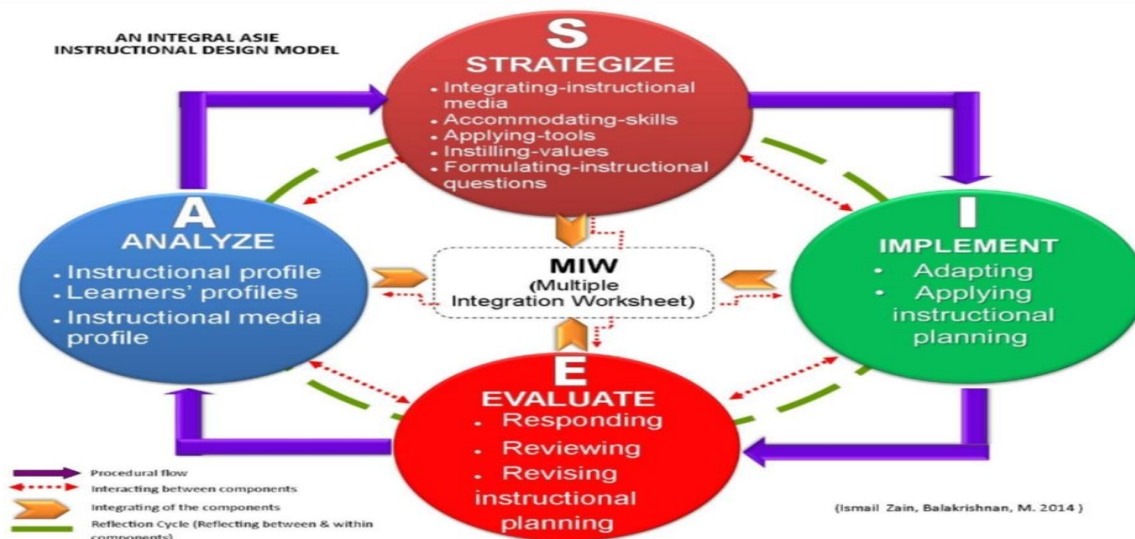
Integration Of Collaborative Learning In Teaching And Learning

Given the definition and the principles of collaborative learning, it is required to integrate collaborative learning into various academic activities. The Russian teacher and psychologist, Vygotsky (1962), was the first to examine collaborative learning through the lens of social learning theories. He observed that people learn through their interactions and communications with others. Again, this correlates with the Ubuntu philosophy. With a clear understanding of what collaborative learning entails, one can recognize its importance in all fronts of teaching and learning and understand that it needs to involve all stakeholders (lecturers, students, support systems and communities). Collaborative learning is integral to the four learning skills required in the 21st century (see point 2, page 5) and makes lecturers and students *co-creators of knowledge* at every institution. The different learning theories that have been associated with collaborative learning include social constructivism, cooperative learning, communities of practice, connectivism and situated learning, among others (Millea, 2009). These theories reflect Fernando and Marika's (2017) argument that learning is socially and culturally mediated. Collaborative learning can be integrated into teaching and learning through (i) developing a collaborative instructional design system for capacitating stakeholders (lecturers and

students) and (ii) infusing collaborative learning into curricula at faculty levels for both undergraduates and postgraduates.

Collaborative Instructional Design System (CIDS) for capacitating stakeholders

The Collaborative Instructional Design System (CIDS) is a 21st-century model or platform for instructional planning that involves multiple role players who collaborate through sharing ideas and strategies to form creative, globally competitive students and citizens. The system seeks to enhance the quality of educational practices, creating inspiring learning environments for students and giving them an opportunity to determine their own learning activities. The CIDS brings a new dimension to education, engaging lecturers and other professional learning communities in a collaborative process that prepares students for active participation in the fourth industrial revolution (4IR). The CIDS comprises the following components: Analyze, Strategize, Implement and Evaluate (ASIE, see Figure 1). The Collaborative Instructional Design Model is key in enhancing professionalism among lecturers while enriching students' experiences, who connect either face-to-face or virtually with other communities.



Figure

re 1: The Integral Analyse, Strategise, Implement and Evaluate (ASIE) Instructional Design Model (Zain, 2021) for collaborative learning.

Infusion of Collaborative Learning into the Curricula at Faculty Level

A good understanding of the elements of the model will facilitate the integration of Collaborative Learning (CL) into curricula. It is important that module outcomes are aligned with teaching and learning methods, choice of assessment task, assessment methods and criteria that promote collaboration at the appropriate National Qualifications Framework level (NQF). The NQF level will influence the type of collaborative learning task that lecturers bring into a particular curriculum. Depending on the module and the diversity of students, lecturers will adopt suitable humanizing pedagogies and design appropriate assessment strategies in accordance with Jacobs and Seow's (2015) eight CL principles, discussed above. CL may be integrated into curricula through group projects (Mpuangnan & Ntombela, 2023); for example, assignments, debates, discussions, presentations, conceptual change teaching (brainstorming) and service learning. These activities promote higher-level thinking skills, confidence and self-esteem, social and interpersonal skills, leadership, creativity, innovation and harmonization skills in heterogeneous groups. Assessments will include designing analytic rubrics that align with the principles of CL.

Collaborative Learning And Technology

In line with the foregoing, Zhang (2013) and Den Exter, Rowe, Boyd and Lloyd (2012) argue for the enhancement of CL using various technologies. Technology which supports synchronous and asynchronous learning activities gives students and academics effective communication and interaction channels. This is in line with the Strategic Goal of many universities in South Africa in terms of developing a digitally enabled smart-university. Achieving this involves creating and adopting new and relevant technologies for the learning environment (Amegbanu & Mpuangnan, 2023). Among other technologies, the university identifies virtual and augmented reality (VR/AR), next-generation SIS (student information systems) and artificial intelligence conversational interfaces (also known as bot functionality, a software application that runs automated tasks over the internet) as important technologies that will improve students' learning experiences. These virtually collaborative technologies and pedagogies need to be anchored in a strong social framework such as ubuntu.

Omodanand Ige (2021) use Ubuntu as a framework for the application of ICT in online collaborative pedagogy. They show that it is easier to apply and attain rewarding collaborative learning using different technologies if students have already been exposed to Ubuntu as a social foundation. Technology rooted in Ubuntu improves the way students interact with teaching materials and with each other, fostering authenticity and deep learning (Gertrude, 2015). In addition, Den Exter et al. (2012) show that using technology-enhanced interaction tools, for instance, encourages social interaction, problem-solving, relationship building, opportunities for reflection, collaborative knowledge production and development of the community of practice. This becomes possible when students have been introduced to the Ubuntu philosophy which reminds them to respect and value the contributions of others (Omodanand Ige, 2021).

Technologies that allow for real-time exchange of information will be useful in enhancing students' experiences and supporting teaching and learning activities in both undergraduate and postgraduate studies. Mallon and Bernstein (2015: 1) argue that collaborative technologies allow for both "... synchronous and asynchronous text, voice, or video chat to online spaces that facilitate brainstorming, document editing, and remote presentations of topics", which our learning management system (LMS) facilitates. Furthermore, illustrations in the form of writing, drawing or demonstrations can be completed easily using virtual platforms or social media (Ansari & Khan, 2020). These platforms promote students' interaction and timely completion of learning activities, even where they cannot find time to engage physically. For instance, tools such as Google Docs and Microsoft Teams are used to facilitate concurrent working on a single document by various users. This shortens both response and completion time for tasks, as participants do not have to wait for each other's input to be formally sent to them before they respond.

Digital technologies are important for classroom and remote learning activities. Interactive tools that are used for online engagement can also be contextualized for physical classroom activities. The use of interactive electronic boards rather than traditional handwritten boards transforms learning from a purely physical interaction into one where collaborative activity can be completed online. Various interactive applications provide assessment platforms which can be useful in encouraging students' participation and engagement with the learning materials. Students will find it easier to share their ideas, experiences, and different perspectives through these platforms so that they have the potential to enrich both online and classroom discussions. Since most of these technologies have options for anonymity, they are also capable of promoting participation even on sensitive topics, thereby increasing the diversity of responses (Gertrude, 2015; Zhang, 2013).

Furthermore, research-based collaborative learning can be enhanced through digital technologies. Collaborative technologies allow for increased interaction between students and their mentors (supervisors), which promotes continuous engagement and virtual interaction between the two parties as an alternative to physical interaction. Mallon and Bernstein (2015) show that external research collaborations can be cemented, and research activities improved through improved communication and interaction. Technologies provide platforms for interaction through meetings, sharing of information and sharing of work platforms. Collaborations with distant institutions and colleagues in the discipline become easier owing to the reduced need for physical interaction.

Creating An Enabling Environment For Collaborative Learning

It is important to acknowledge that CL already exists in teaching and learning at many universities. Universities have an advanced learning management system which can support CL through technology; however, it is under-utilized because of a lack of staff and student capacity, and disruptions in power and connectivity (Mpuangnan et al., 2024). These two factors are currently hampering our drive to become a digitally enabled institution. To a lesser extent, teaching infrastructure is not conducive to CL. Thus, to enhance the effective implementation of collaborative learning, lecture halls would need to be suitably equipped with learning and teaching aids that encourage collaborative learning.

Conclusion

The intention of this concept paper was to create a basis for the understanding of collaborative learning and motivate collaborative learning at Universities. The paper has provided an outline of the contextual framework, along with the epistemological and pedagogical principles that should inform the theory and practice of CL.

Furthermore, the paper has highlighted the significance of CL as a decolonizing and humanizing pedagogy in institutions of higher learning. We argue that an intentional and informed approach to collaborative learning if applied correctly, provides a channel for enhancing the quality of teaching and learning. It creates an environment where all voices matter, thus contributing to improved learning outcomes and shaping students who are prepared to take their place in the global community. In addition, this concept paper has identified key principles for the practice of CL, and offered concrete examples of how it might look when implemented. Academics are encouraged to purposefully infuse collaborative learning practices into their teaching, to use technology to increase student engagement and to involve students, wherever possible, in task design, monitoring and assessment.

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