FIELD FACILITATION IN OPEN AND DISTANCE LEARNING IN RESOURCE-CONSTRAINED ENVIRONMENTS: A CASE OF MZUZU UNIVERSITY, MALAWI

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DEDICATION

My study is dedicated to those who work towards epistemic fairness for epistemologically marginalised individuals.

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ABSTRACT

As part of the drive to enhance students' learning experiences and success for students pursuing the B.Ed Science programme through distance education at Mzuzu University (Mzuni), the Open and Distance Learning (ODL) Steering Committee of Mzuni introduced the field facilitation strategy in 2014 to provide additional academic support to such students off campus. There have been questions, though, regarding the effectiveness of this strategy in terms of enhancement of student learning and success. This study, therefore, sought to examine the current field facilitation strategy in the B.Ed Science programme under the ODL mode of delivery, with a view to proposing improvements that would be made to the field facilitation strategy so that it enables enhanced learning and success in Science and Mathematics at Mzuni. Efforts to improve the current field facilitation strategy have been informed by an empirically based understanding of the shortfalls and strengths of the existing field facilitation strategy for ODL students in the B.Ed Science programme.

To enhance students' learning and success for ODL students in resource-constrained contexts such as Mzuni and similar contexts, the study adopted a qualitative case study design guided by tools from the second generation of the Cultural Historical Activity Theory. Qualitative data was obtained in two phases, a contextual profiling phase and a modified Change Laboratory Workshop phase. The modified Change Laboratory Workshops were conducted through the social media application 'WhatsApp' rather than in person as is usually done. Qualitative data in the contextual profiling phase was obtained from three categories of participants, namely, Science and Mathematics lecturers, Science and Mathematics field facilitators, and Science and Mathematics students. The contextual profiling phase included surveys, focus group interviews, individual interviews with lecturers at Mzuni and the field facilitators from the five satellite learning centres of Mzuni, and document analysis. The contextual profiling data acted as the mirror data for the next phase of data generation (Change Laboratory Workshop phase).

The findings indicated that the support currently rendered by field facilitators to ODL Science and Mathematics students was inadequate and consisted of a shallow mode of instruction focusing on

traditional ways of teaching and learning. This meant that the field facilitators focused on lecturing as a pedagogical strategy for supporting the learning of Science and Mathematics. This was largely because the support offered to field facilitators by Mzuni was inadequate and did not empower them to generate their own strategies of conducting field facilitation innovatively and creatively, which would in turn empower the students to engage actively and reflectively in their own learning activities. This was due to structural, historical and cultural tensions that existed in the larger system (the university system). The implementation of the field facilitation strategy was challenged by such conflicts in the university structure which manifested themselves in the smaller activity system (the field facilitation activity system) which is the focus of this study. Thematically, such conflicts included students' attributes, institutional policies, institutional pedagogy and the material and digital divide which Mzuni has not harnessed to support field facilitation.

The study further established that institutional sensitivity to the conflicts raised above would result in an improved field facilitation strategy as the conflicts at the higher level (university level) have an impact on what happens in the smaller systems, for example the ODL in general and the field facilitation activity system in particular. The improved field facilitation strategy was supposed to recognise ODL students as students in transit from the traditional face-to-face learning context to the novel ODL learning context. As such, the transitional period of study from secondary school to university, particularly to year one, required an intensive field facilitation support strategy, and thus greater institutional support for both field facilitators and students for enhanced learning experiences and success that would eventually result in improved students' retention and throughput. The findings of this study will therefore inform all those involved in ODL, particularly those in resource-constrained contexts, to be conscious when implementing ODL innovations. Serious consideration of the contexts in which the innovations are to be implemented is critical.

Keywords: field facilitation, student learning and success, science and mathematics, Open and Distance Learning (ODL), retention and throughput, higher education

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LIST OF ACRONYMS

CDCE	Centre for Distance and Continuing Education
CHAT	Cultural-Historical Activity Theory
CLW	Change Laboratory Workshops
CODL	Centre for Open and Distance Learning
MCDE	Malawi College of Distance Education
MDG	Millennium Development Goals
MoEST	Ministry of Education, Science and Technology
MPRSP	Malawi Poverty Reduction Strategy Paper
NESP	National Education Sector Plan
ODL	Open and Distance Learning
PIF	Policy Investment Framework
SADC	Southern African Development Community
SDG	Sustainable Development Goals
STEM	Science Technology, Engineering and Mathematics
UNESCO	United Nations Educational, Scientific and Cultural Organisation
UNIMA	University of Malawi
ZPD	Zone of Proximal Development

CHAPTER ONE: THE STUDY CONTEXT AND RATIONALE

1.1 Introduction

Questions of physical access to university are often discussed as social justice concerns, with deliberations about who enters a university and who is excluded. But there is less research on issues of epistemic access for instance equitable access to knowledge. Epistemic justice is critical for optimal student growth and development in higher education contexts in general and in Open and Distance Learning (ODL) in particular. There is a need for us to consider how ensuring epistemic access is an issue of justice because unless we afford access to the powerful knowledge of the academy, we are doing our students an injustice (Young, 2008; Young & Muller, 2013). This study grapples with such issues from the perspective of ODL in Malawi.

This chapter, Chapter One, introduces the study and includes the personal motivation that led to the pursuit of the study. It also provides the context and rationale for the study. The chapter highlights the global, regional and local developments in the provision of ODL with a specific focus on pre-service teacher education in Malawi. The context is further detailed through an overview of the learning support strategies provided for Science and Mathematics students in the B.Ed Science programme under the ODL mode of delivery at Mzuzu University (Mzuni) in Malawi.

1.2 Personal History and Motivation

My motivation to conduct this study dates back to my school years, especially when I was in secondary school in my home country, Malawi, one of the poorest countries in the world (Onyibor et al., 2018; Worldatlas.com, 2023). I did my secondary schooling in an under-resourced school both in terms of human and material resources. We had few Science and Mathematics teachers and few teaching and learning materials. The school science laboratory was inadequately resourced and worked as a multipurpose laboratory that catered for all science subjects. This forced us to do more classroom learning than practice in the science subjects which made understanding of scientific concepts and application of what was learnt difficult.

Despite these challenges, I succeeded in Science and Mathematics subjects at that level. I had learnt some survival strategies and study skills. Significantly, I had the privilege of accessing reference materials from a nearby Distance Education Centre. The Distance Education Centres were in many ways equivalent to secondary schools, but the major difference is that they were tutoring and examination centres for secondary school distance students (Chakwera & Saiti, 2005). These centres provided for students who qualified for secondary education but could not be enrolled in government secondary schools due to bed and classroom space challenges. Students who enrolled for secondary school levels for distance education used DECs to access self-study materials and attend tutorials (Chakwera, 2005). These centres were provided with specially produced print instructional materials called "sets". Sets were designed in such a way that a student learning on their own could follow the lesson. In other words, they were learner friendly and based on the idea of self-regulated learning.

I used the sets in addition to the classroom notes and textbooks that I had access to in my own school. I found the sets useful and easy to follow. I have a specific example of studying one of the courses, Business Studies, during my Malawi School Certificate Examinations[1] (MSCE) purely through self-study. Surprisingly, it was the subject in which I scored the highest on my MSCE results.

After finishing my secondary schooling, the University of Malawi (UNIMA) selected me to do a Bachelor of Education (Science). At UNIMA, the academic environment was not friendly. I experienced a lot of intimidation both from fellow senior students and lecturers. The students used to tell us that if you want to prematurely exit the university then take sciences. This meant that chances of persisting to graduation in Science and Mathematics programmes were slim. I remember one science lecturer saying to us that the class was too big and that some of the students

[1] Malawi's secondary school exit certificate.

had to be excluded. He said, “Last year I withdrew 30, this year the number is likely to increase because you are too many”.

Despite such intimidation I hung on, though with some repetitions and supplementary examinations along the way. In 2001, I graduated as a Science and Mathematics secondary school teacher. The memories of intimidation, failure and repeating courses remained with me. I kept asking myself: Why was it so difficult for me to learn Science and Mathematics at the university? I reflected on how I had managed to learn and pass sciences and mathematics at school despite being in an extremely poorly resourced context. It was a puzzle. I could not figure it out.

I started realising where the problem lay when I became a Science and Mathematics teacher at a secondary school in Malawi later in 2001. I realised that it is not only how the subjects are taught (pedagogy) or the availability of teaching and learning resources (human and material) that matter. It is the totality of the study environment that matters. This includes the contextual history, the culture of the learning environment and the surrounding environmental context. I recalled my own primary and secondary school learning cultures and environments. I reflected on the curricula and the contents. I reflected on pedagogy. I tried to make connections with our traditional ways of teaching and learning and that which was practiced, valued and rewarded in schools. I became increasingly aware of the contradictions and conflicts in my own experiences.

I tried to look around at those who had been through formal schooling before me. They were very few. I listened more carefully to how education was discussed in the common talk of the village, but there was very little conversation about formal education. The main topics of conversation were witchcraft and initiation and marriage ceremonies. The only spaces I could point to as spaces where what I had learnt could be put into practice was the nearby primary school. While much of what was learnt in school was connected to the church, the applicability of what I learnt in school was heavily limited in real-life situations. The environment itself in the church was tense as we were raised to believe that some literature and some views could not be questioned. The same was the case in the traditional informal learning spaces of the village. All these spaces were in conflict with the norms of questioning and criticality that was necessary for Science and Mathematics learning as I understood it.

Furthermore, at the nearby primary school, much of what was taught was teacher-centred and theory based. There was an extremely strong hierarchy and obedience to the teacher. In addition, as most schools originated from and were connected to local churches, biblical values had to be adhered to. With all these reflections going on in my mind during my secondary school teaching, my way of thinking and looking at student learning began to change. The low school retention and throughput in Science and Mathematics (Maritim et al., 2012; Mukasa-Lwanga, 2018) seemed to be shaped by this context.

In 2005, I joined the teacher education sector when I was employed as a lecturer at Domasi College of Education. What was special at this college was that it offered distance education programmes and my interest in how learning took place through a distance mode was further enhanced. At Domasi College, ODL instruction was through print materials called "modules".

What immediately struck me was how student learning through ODL proved successful at Domasi College as there were no notable problems as far as student retention, progression and graduation were concerned (Chakwera & Saiti, 2005). The course that I was teaching, Instructional Media and Technology, was a clue to this wonder. Although my focus was on teaching and learning in secondary schools, I also had questions about the teaching and learning technologies and methods used in the ODL mode of delivery at university level. It was around this time that I got a scholarship to do a Master of Science degree in Instructional Systems Design at Kumamoto University in Japan. This opened a new window for me to learn about e-Learning for distance education as my area of research interest. I learnt that e-learning allows for student engagement which is not the case with the print-based ODL model. However, this proved not to be the case in a Malawian context where technological infrastructure was still underdeveloped. The master's degree gave me an opportunity to move from Domasi College to Mzuzu University (Mzuni). It was at Mzuni that my curiosity grew further about how students learn through distance, and I became especially interested in how such learning plays out in Science and Mathematics related programmes.

I noticed that, compared to my earlier workplace, a great number of students in Science and Mathematics studying through this distance mode were withdrawing from the university on academic grounds. Although the causes of this problem were not established, there was a clear problem evidenced by looking at the rate at which this was taking place in Science and

Mathematics as compared to arts or humanities and languages education programmes. I had several unanswered questions but the key one which motivated me to embark on this study was "How are these students academically supported?" I had a sense that there was insufficient support for students to enable meaningful engagement with the distance learning materials. I reflected on my own experiences and challenges in having to make meaning of learning materials with little by way of support and I also considered examples during my years of study where support had been available and had changed my entire learning experience. It was with such reflections that I engaged in the study presented here.

I embarked on this study in 2018 and developed the proposed methodology in 2019. I could not foresee, though, the global events of 2020 and the Covid-19 pandemic, which changed the way in which many researchers had to gather their data for at least two years. My study was affected in two main ways. Firstly, I was unable to travel to South Africa to meet with my supervisors in person and due to poor Internet infrastructure meeting online was often a challenge. This meant that I truly became a distance PhD student. Secondly, I had to make changes to my methodology, specifically in the second phase of my study. These changes will be discussed in detail in Chapter Four. My personal journey of doing my PhD at a distance has given me some experiences in common with other distance learners.

1.3 Distance Learning

The literature on ODL is discussed in detail in Chapter Two but for the purposes of ensuring a shared terminology I briefly discuss it in this first chapter. Distance learning has varying definitions shaped by its history and the rise of technology enabling its delivery. Distance learning has been largely defined as a mode of study where a learner may complete all or part of an educational programme in a geographical location apart from the institution hosting the programme (Johnston, 2020; Keegan, 2013; Saykili, 2018). Further, distance learning has been defined by Obioha and Ndidi (2011) as a form of education and training in which using learning resources rather than attending classroom sessions is the central feature of the learning experience. Sherry (2000), attempting a synthesis of other authors' definitions, advanced that the hallmarks of distance education are: the separation of a teacher and a student in space and/or time (Perraton, 2020); the volitional control of learning by the student rather than the distant instructor (Jonasses,

1992 in Sherry, 2000); and non-contiguous communication between a student and a teacher mediated by print or some form of technology (Garrison & Shale, 1987; Keegan, 1980).

Alternatively, according to Tenebe and Ogidan (2013), ODL is seen as a system in which learning opportunities are taken to the learner irrespective of age, gender and prior learning wherever they may be. This gives them the freedom to choose the mode, medium, time, pace, place, process and purpose of learning while using any one form or combination of forms of available suitable and appropriate technology. 'Openness' in ODL refers to the disregard of many traditional barriers to formal learning such as age and (to some extent) previous level of academic achievement.

Distance learning is seen as a form of learning that frees up students to study at any time and in any place and in structures suited to their employment and family commitments (Keegan, 1995). Many theorists argue that distance learning takes place on a continuum of types of education which has at one end the totally supportive one-to-one or face-to-face situation and at the other end a process of learning from materials which is devoid of human interaction (Sewart, 1993).

The definitions and deliberations on ODL are the subject of the next chapter (Chapter Two). This study looks at ODL in one programme – Bachelor of Education in Science (B.Ed Science) at Mzuzu University and the remainder of this chapter provides an overview of the study context and introduces the study questions.

1.4 The Context of the Study

The education system in Malawi is organised on a three-tier system comprising: primary (elementary) school that has standards 1 to 8; secondary (high school) that consists of forms 1 to 4; and tertiary graduate education, which takes an average of four years for a basic degree. However, the Malawian education system does not take place in a system separated from global influences. I therefore begin the discussion of context from a larger set of lenses.

1.4.1 The global context

Since the end of the Second World War, there has been a surge in demand for higher education beyond the higher education system where the elite social groups make up the bulk of the student body. There has been an international move towards widening access to higher education to all.

This massification (Evans et al., 2021) entails more than a rapid increase in numbers beyond what the higher education system can manage. The massification has also resulted in the inclusion of students from a wide range of social groups entering higher education with implications for teaching and learning. The notable implication in teaching and learning has been the highly differentiated pedagogical arrangements (Evans et al., 2021). This has to a greater extent been influenced by notable global policies on higher education such as the Sustainable Development Goals (SDGs) and United Nations Educational, Scientific and Cultural Organisation (UNESCO) as will be discussed later. These global policies and strategies are operating with an awareness of an increased interconnectedness of global forces such as neoliberalism, knowledge economy and globalisation which are discussed in detail in the next sections of this chapter.

As the global economy has grown, universities have increasingly come to be constructed as sites for training of the workforce, even though many institutions of higher education have little experience of offering anything other than study in the traditional academic disciplines (Boughey & McKenna, 2021). Innovative ways of teaching and learning are required to respond to the new global demands of the so-called knowledge economy. The knowledge economy revolves around the idea that it is knowledge that is the primary driver of the economy in a globalised world. Countries that wish to develop their economic stability and growth therefore need significant numbers of highly skilled labourers. Before this dilemma could be resolved, higher education institutions have been faced with another challenge of increased student enrolments as more individuals sought higher education to get qualifications for the global market. The existing traditional structures could not accommodate the increasing number of students. In the context of Malawi, ODL was regarded as part of the solution to access higher education in the face of resource and infrastructural challenges.

Globalisation which drives a significant interconnectedness between countries' activities and economic wellbeing and the emergence of the knowledge economy are both seen to have increased the demand for higher education (Brown et al., 2008). However, this has happened within an ideology of neoliberalism.

Neoliberalism has resulted in governments globally embarking on opening up trade by making businesses, including government businesses, open to all with the aim of improving efficiency.

The basic principles of neoliberalism are that the best form of social arrangement is economic and that this is most efficiently done through a free market. This has resulted in governments privatising most of its agencies. These forces have also affected higher education institutions as universities have started to operate more as business entities (Pucciarelli & Kaplan, 2016).

Locally, the Malawian government expects higher education institutions to operate as efficiently as possible (Peter Mutharika, President of the Republic of Malawi, 2016) and find alternative means of mobilising resources for their institutions to fund university activities. With reduced government funding, universities have had to come up with strategies that would generate revenue for their institutions. Following similar strategies in other countries globally, Malawian universities have raised student fees. The Malawian government has raised concerns about the rapidly increasing student fees, which means that universities need to generate immediate financial resources.

One of the mechanisms used was to increase the use of ODL which was understood to allow for an increase in student numbers with limited increase in resources. It was understood that ODL programmes would use existing structures (departments and faculties) with some administrative staff in the Centre for Open and Distance Learning which would facilitate the production of study materials and staff training in ODL teaching, free from constraints of bed and classroom space. This is according to the Mzuzu University Act and Statutes (1997) which right from its establishment was mandated to offer programmes using both face-to-face and non-traditional means such as through ODL. This is also reflected in the Malawi Growth and Development Strategies (MGDS) I to III where distance education is earmarked as a strategy for broadening access to university education in Malawi.

The focus on ODL has increased dramatically in the last two decades, thanks to the forces of globalisation. In developed countries like Australia, the United Kingdom, the United States of America, Japan and South Korea, ODL has captured the interest and attention of academics and the public (Pappano, 2012). While ODL has been criticised for underestimating the socialisation aspects of learning (as discussed in Chapter Two), change advocates in these countries have hailed ODL as transformative and a game changer in achieving education for all goals and access to education. Forces such as globalisation, massification and the emergence of the knowledge

economy have greatly increased demand for higher education around the world, including an increased focus on the possibilities of ODL.

Globalisation and the implications of the knowledge economy have also seen the emergence of several policies and strategies that tie countries together as stated earlier. For example, Malawi subscribes to several global conventions, one of which is the Sustainable Development Goals (SDGs). The SDGs were developed by the United Nations General Assembly in 2015 in which 193 countries signed the United Nations Sustainable Development Goals for 2030 (Pedersen, 2018). The SDGs are a revised version of the previous global convention of Millennium Development Goals (MDGs). The literature shows that the original eight MDGs did not adequately address all global concerns, hence, the development of the SDGs was needed (Sachs, 2012). The MDGs expired in the year 2015 and the SDGs were introduced in the same year and are expected to expire in 2030.

The SDGs are a collection of 17 interlinked goals designed to be a blueprint to achieve a better and more sustainable future for all globally (Pedersen, 2018; United Nations, 2015). One of the 17 SDGs, goal number *four* focuses on education. Goal four of the SDGs is aimed at *ensuring inclusive and equitable quality education and promoting lifelong learning opportunities for all* (United Nations, 2015). Goal four of the SDGs has the following targets:

1. Ensuring that all girls and boys complete free, equitable and quality primary and secondary education leading to relevant and effective learning outcomes by 2030.
2. Ensuring that all girls and boys have access to quality early childhood development, care and pre-primary education so that they are ready for primary education by 2030.
3. Ensuring equal access for all women and men to affordable and quality technical, vocational and tertiary education, including university by 2030.
4. Substantially increasing the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship by 2030.
5. *Eliminating gender disparities in education and ensuring equal access to all levels of education and vocational training for the vulnerable, including persons with disabilities, indigenous peoples and children in vulnerable situations by 2030.*

6. Ensuring that all youth and a substantial proportion of adults, both men and women, achieve literacy and numeracy by 2030.
7. Ensuring that *all learners acquire the knowledge and skills needed to promote sustainable development***,** including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship and *appreciation of cultural diversity* and of culture's contribution to sustainable development.
8. *Building and upgrading education facilities that are child, disability and gender sensitive and provide safe, nonviolent, inclusive and effective learning environments for all by 2030.*
9. Substantially expanding globally the number of scholarships available to developing countries, in particular the least developed countries, small island developing states and African countries, for enrolment in higher education, including vocational training and information and communications technology, technical, engineering and scientific programmes in developed countries and other developing countries by 2030.
10. Substantially increasing the supply of qualified teachers, including through international cooperation for teacher training in developing countries, especially least developed countries and small island developing states by 2030 (United Nations, 2015).

Higher education provision through ODL is one key tool for achieving inclusive and equitable quality education and promoting lifelong learning opportunities (Lancet, 2012).

1.4.2 Open and Distance Learning in the regional context

All Southern African Development Community member states have made commitments to the SDGs and Education for All (EFA) targets. The Southern African Development Community (SADC), established in 1992, is a collective of countries that have agreed to socioeconomic cooperation. The SADC region has a population of 345 million (SADC, 2018). It consists of 16 member states: Angola, Botswana, Democratic Republic of Congo, Lesotho, Madagascar, Malawi, Mauritius, Seychelles, Comoros, Mozambique, Namibia, South Africa, eSwathini, Tanzania, Zambia and Zimbabwe. The main goal of SADC is to improve economic growth and development, alleviate poverty, enhance the quality of life of the people of the region, support its socially disadvantaged areas through deeper regional integration and enhance the quality of the people's

lives of the region (SADC, 2018). Key to this goal is to increase access and equity to quality education (Simango, 2016). However, several factors limit access to quality equitable education in the region, namely, absenteeism and dropout due to loss of opportunity costs, limited coverage of school catchment areas, the cost lines of conventional education systems, limited school infrastructure and consequent overcrowded classrooms, inadequately trained and qualified teachers, and outdated curricula (Kotecha, 2012). Given this prevailing situation in SADC states, one may appreciate the crucial role that ODL could play. The SADC (2012) states that ODL has helped to address the access challenge to higher education which the conventional education systems in the region have failed to address.

In the recent past, higher education has been characterised by low participation rates in the SADC countries (SADC, 2012). Available data shows that the gross tertiary enrolment ratio is at 6% compared to the global average of 27% (Kotecha, 2012). The limits of physical capacity combined with the demand for higher education suggests that ODL could play an important role in this context (Nage-Sibande & Morolong, 2018; Nage-Sibande & Vollenhoven, 2012).

The UNESCO has given much support to ODL regarding effective deployment, developing print materials, sharing good practice and, more recently, enabling e-learning through their engagements with SADC countries. The Commonwealth of Learning has been working with African Commonwealth countries to design and implement both ODL policy and practice. At the regional level, there has been a drive by the SADC states to enhance capacity of ODL practitioners by providing specialised training in designated centres (Isaacs & Mohee, 2020; Malingumu & Chakwera, 2012) called centres of ODL specialisation.

Within the SADC region there have been many advances in the provision of open and distance education. The Open University of Tanzania in Tanzania, Zimbabwe Open University, the University at Dar es Salaam and the University of South Africa (UNISA) all offer ODL at the tertiary level. At the secondary school level, ODL is offered through open schooling in Mozambique, Namibia, Botswana and Malawi. At the teacher education level, the Domasi College of Education in Malawi, the University of Zambia and the Mauritius College of Air/Open University offer ODL courses within the region. There has been a high level of participation at the SADC level in issues of ODL. The SADC is striving to meet its target in achieving gender parity,

its commitment to education for all and issues of access and provision of quality teachers for its schools. Open and Distance Learning (ODL) in the region has been identified as one means of responding to such challenges. In order to understand the specific context in which this study on ODL took place, there is a need for a brief picture to be drawn of education in Malawi.

1.4.3 The Malawian formal education context

1.4.3.1 Organisation of education during the colonial era

Malawi, formerly referred to as Nyasaland, was a British protectorate from 1891 to 6 July 1964. The organisation of education in colonial Malawi was strikingly similar to other British colonial states in Africa. For example, education in Malawi was initially largely in the hands of the missionaries (Wandiga, 1994). As a result, expansion of the education system was limited because the missionaries used education to teach people basic literacy skills such as reading, writing and numeracy, popularly known as the 3Rs. These core skills were emphasised so that people would be able to read the Bible and perform basic survival functions (Wandiga, 1994). These enabled Africans to carry out basic socioeconomic activities such as farming, needlecraft, metalwork, carpentry and masonry. For example, in Malawi, the Livingstonia Mission included courses such as English and mathematics in their school curriculum so that the converts would be able to read and write (Pachai, 1973).

The missionaries largely used the f2f mode of delivering content probably because formal education was offered to a limited number of people. Nevertheless, after 1926, the colonial government began to support the missionaries with financial resources after the missionaries had urged African colonial governments to take a serious interest in the formal education of their people. As Wandiga (1994) observed, the colonial Malawian government's interest in education was to train clerks who could help in clerical duties in government departments. Throughout the colonial period (1891–1964), expansion of education was slow since it was not intended to foster and boost socioeconomic development of Africans under British rule but rather to provide the skills for the administration of British rule. There was no distance education within the country during this period. The very few Africans in colonial Malawi who studied through distance education at this time did so through institutions that offered distance education from abroad, especially in South Africa and the United Kingdom.

1.4.3.2 Organisation of education during the post-independence era (1964 to present)

After the attainment of independence from the British Government in 1964, Malawi embarked on the expansion of the education system so that as many citizens as possible would be educated to enable them to participate in socioeconomic development activities. The government articulated this goal of education as central to economic growth even in recent policy documents including the Policy Investment Framework (PIF) (2002–2015) (Ministry of Education, Science and Technology [MoEST], 2000), the Malawi Poverty Reduction Strategy Paper (MPRSP) (2002), the Malawi Growth and Development Strategy (MGDS) III (2017–2022) and the National Education Sector Plan (NESP) (2008–2017). Furthermore, the policy documents delineate challenges facing the education system and propose strategies for developing the sector to achieve the education for all and SDGs.

Since independence, Malawi has witnessed expansion of education at all three educational levels (MoEST, 2008). The enrolment for primary and secondary schools at the time of gaining independence was only 359 841 and 5 951, respectively (MoEST, 2008). Since 1964, enrolment continued to increase steadily for both the primary and secondary school sectors. This trend further increased in 1994 soon after the introduction of free primary education until the figures got to 1 895 422 for primary schools and 46 444 for the secondary school sector. Secondary school was offered in both f2f and ODL formats with the government taking the bold decision to establish the Malawi College of Distance Education (MCDE) in 1965, barely a year after independence.

Inevitably, the rapid increase in enrolment at both primary and secondary school levels exerted enormous pressure on Malawi's university education system given that the UNIMA was the only public university from 1965 to 1997. This forced the government to open a second public university, Mzuzu University (known as Mzuni) in 1997. Unlike UNIMA, which was initially mandated to offer its programmes through the f2f mode of delivery, Mzuni was from its establishment mandated to offer its programmes through both the f2f and ODL delivery modes (Msiska, et.al, 2013; Chibambo, 2009, 2016). Mzuni introduced ODL programmes in 2006 in the Faculty of Education offering B.Ed Science and B.Ed Arts programmes coordinated by the Centre for ODL using the existing infrastructure that was built for conventional f2f academic

programmes. It may have been easier for Mzuni to introduce ODL programmes as ODL was initially included in its statutes during its establishment.

The ODL Centre of the university is situated at the Mzuni main campus with Satellite Learning Centres across the country; two in the south, one in the centre and the other two in the north including one at the main campus at the ODL Centre. The ODL Centre at Mzuni also houses a satellite learning centre besides functioning as the administrative office of the entire ODL. The two Satellite Learning Centres in the southern region are in Mulanje and Balaka, in the central region in Lilongwe and in the northern region in Mzuzu at Mzuni's ODL Centre and in Karonga. This means that there are five ODL Satellite Learning Centres of Mzuni spread across Malawi including the one at the main hub. The map of Malawi below in Figure 1.1 shows the distribution of the ODL Satellite Learning Centres of Mzuni.

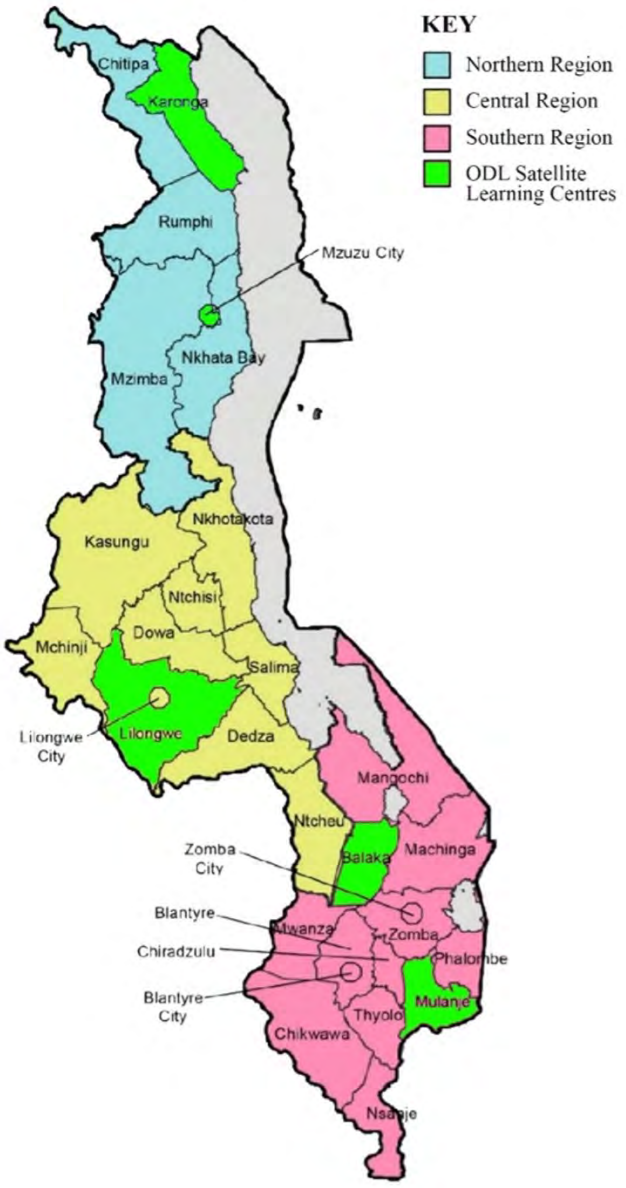


Figure 1.1: Map of Malawi showing distribution of Mzuni's ODL Satellite Learning Centres

(Maduekwe & De Vries, 2019)

Although the Centre for Open and Distance Learning was established in 2006, it took another five years before the recruitment of the first cohort of ODL students in 2011. The recruitment of the ODL students was marked by challenges which importantly increased dropout rates particularly in the B.Ed Science programme. Dropout cases became more pronounced as the ODL student

population increased in 2014. It was in the same year that the Malawi MoEST implemented the curriculum reform in Malawian secondary schools (Chirwa & Naidoo, 2014). The curriculum reform was science-biased, which further resulted in great demand for Science and Mathematics teachers which contradicted the Science and Mathematics teacher output from the universities, particularly in Mzuni's B.Ed Science programme under the ODL mode of delivery due to high dropout rates (see Table 1.1 below).

Table 1.1: The student dropout situation in the ODL B.Ed Science programme

	Cohort number	**Year**	**Programme**	**Initially enrolled at the beginning of year one**	**Enrolment at the end of year one**	**Number of students that dropped out**	**Percentage of students that dropped out of those initially enrolled**
Before introduction of field facilitation	Cohort one	2011	B.Ed Arts	23	17	6	26.09
			B.Ed Science	5	1	4	80.00
	Cohort two	2012	B.Ed Arts	128	90	38	29.69
			B.Ed Science	16	7	9	56.25
	Cohort three	2014	B.Ed Arts	433	293	140	32.33
			B.Ed Science	84	29	55	65.48
After introduction of field facilitation	Cohort four	2015	B.Ed Arts	506	385	121	24.01
			B.Ed Science	105	51	54	51.43

	Cohort five	2016	B.Ed Arts	619	409	210	33.93
			B.Ed Science	212	117	95	44.81
	Cohort six	2017	B.Ed Arts	649	451	198	30.51
			B.Ed Science	233	131	102	43.78

Source: Mzuni Academic Office (2018)

In 2014, the Malawi Government through the MoEST recommended a reform in the secondary school curriculum referred to as the Secondary School Curriculum Assessment Reform (MoEST, 2015). The reform made the curriculum more Science and Mathematics focused rather than focusing on arts and humanities subjects. However, this was done without research on the country's capacity and that of Malawian secondary school teacher training colleges or universities to support the reforms (Bentrovato & Dzikanyanga, 2022). The secondary school curriculum reform was not realistic as it did not consider the capacity of teacher training institutions when training of Science and Mathematics teachers. Although efforts are being made to make higher education accessible and to increase teacher output through the introduction of ODL, there is still a problem of student dropout in Science and Mathematics in such programmes (See Table 1.1).

The transition rates of students from primary to secondary and from secondary to university levels have persistently remained low despite the Malawian government's mandate of broadening and increasing access and equity to higher education (Msiska et al., 2013). One such strategy for achieving this was to make single mode conventional institutions into dual institutions, where dual means combing pre-existing conventional f2f programmes with ODL programmes using the very same staff teaching on f2f programmes. Despite the attempts by some universities in Malawi to embrace this, among others, Mzuni's retention, progression and graduation levels of students studying through ODL has remained significantly low particularly in Science and Mathematics (Kazima & Mussa, 2010).

The same scenario exists for the Mzuni ODL B.Ed Science programme which was the case of this study. Table 1.1 shows comparisons of the levels of persistence in the B.Ed Science programme and the B.Ed Arts programme. Comparatively, there are low levels of persistence in the B.Ed Science programme compared to the other programmes.

The Malawian government has used a range of policies to steer the growth of education and to drive the country's participation in the knowledge economy. The NESP (2008–2017) is the Malawian government's fourth educational plan since independence. The plan reflects the government's aim to improve access, equity, quality, relevance, governance and management of the country's education system. The NESP was approved with the idea that it could act as a catalyst for socioeconomic development and growth. It represents an attempt to lay a distinct path for the five educational sub-sectors (primary, secondary, technical and vocational training, teacher education and higher education).

Alongside the NESP is the third Malawi Growth and Development Strategy (MGDS III), which was intended to be implemented from 2017 to 2022. It is the fourth medium-term national development strategy aligned to the country's long-term national development aspirations which are articulated in Vision 2020. The previous development strategies that were developed to implement Malawi's Vision 2020 were the MPRS and the Malawi Growth and Development Strategy (MGDS) I and II. The MGDS III was meant to be the final strategy to take Malawi to the realisation of Vision 2020 which included broadening and increasing access to tertiary education (National Economic Council, 2000).

This resonates well with the Education Sector Implementation Plan of Malawi (ESIP) of 2015. The ESIP (2015) stresses the need for increasing access and equity to education for all people as one of the priorities of the Malawian government (Chawinga & Zozie, 2016a). However, this has recently been revised by focusing on inclusive wealth creation and self-reliance (Nalivata, et.al, 2015). Wealth creation will not be possible without skilled workforce. This therefore calls for strategic planning with regard to manpower or labour creation which is reflected in the Malawi 2063 Vision of Human Capital Development (Enabler 5 of the Malawi 2063 Vision). The key agent of human capital development is an education system which is accessible, equitable, flexible, affordable and inclusive. E-learning, the modern form of distance education, is recognised as one

way of enabling accessible and equitable provision of education to Malawians which fits well with the context of my study. My study further fits with the context as the MWV 2063 stipulates that the scientific and technical skills at the secondary and tertiary education levels will be enhanced. Science, Technology, Engineering, Arts and Mathematics courses, in particular, shall be strengthened as a key to innovation and job creation (Kayange, 2021).

According to a paper commissioned for the *Education for All Global Monitoring Report 2003/4, The Leap to Equality (2003)*, significant progress has been made at policy level to include a gender-sensitive educational framework. The MoEST's PIF from 2000 to 2015 and the MPRSP clearly state that high priority would be given to the gender imbalance and inequity in the education system at all levels (primary, secondary and tertiary). Both the PIF and MPRSP recognised the need for gender sensitivity in education through appropriate educational policies and practices. However, gender-focused initiatives outlined in the PIF and MPRSP are directly more pronounced and visible in the policy-related areas of educational access, equity and relevance of the curriculum at all levels of the education system. The major challenge has been to put the gender-sensitive policies into practice in the learning environment and implementation of the curriculum. While much effort has been concentrated on the primary level, there is a need to seriously come up with realistic and practical strategies for secondary and tertiary levels of education. It has been observed that the tertiary level has been a bit slow in responding to gender imbalances and inequality particularly in Science and Mathematics teacher education programmes right from the point of admission.

Some tertiary institutions have put in place strategies to increase access to university education but this has not targeted an increase in access for female students. This has been the case because universities are guided by specific institutional admission policies which focus on candidates' aptitude at the secondary school leaving certificate level which are gender insensitive (Chikunda, 2013). What has been missed is the girl child's academic empowerment at primary and secondary school levels which is the supplier of university candidates. This means that fewer women qualify for university entry compared to their male counterparts which disadvantages them right away at the point of admission. This is particularly worse in Science and Mathematics disciplines where females are initially stereotyped at the primary school level as Science and Mathematics disciplines

are seen as male disciplines. This means that even fewer females qualify for entry into Science and Mathematics teacher education programmes at the university level (Saucerman & Vasquez, 2014).

In the teacher education sector, issues of equity and access are priotised in both the SDGs and the ESIP. Within this, significantly for this study, teacher training through ODL has been identified as one means for realising equitable access to education. This was first clearly outlined as a strategy in the NESP of 2008 (Msiska et al., 2013). The NESP (2008) views education at all levels (nursery, primary, secondary and tertiary) as a catalyst for socioeconomic development and industrial growth. Limited capacity and therefore access to university education was recognised as a barrier to the attainment of the vision of the NESP, necessitating the introduction of ODL.

Given the curriculum reforms and advances in policy increasing demand for higher education, universities in Malawi were under pressure to meet the demand for Science and Mathematics teachers in Malawian secondary schools which was created after the revision of the Malawian secondary school curriculum in 2014 (Chirwa & Naidoo, 2014). It should also be pointed out that the secondary school curriculum revision was a reaction by the MoEST to the presidential declaration of 2009 to transform the Malawian economy from that of predominantly importing and consuming to that of producing and exporting economy (Nampota et al., 2008) and science and technology biased secondary school curriculum was regarded as a critical agent. This was a copy and paste practice from the Asian tiger booming economies, particularly from Singapore, where their curricula reforms in their high school education sectors resulted in rapid economic and social development. However, in Malawi, this was hurriedly done without considering the Malawian contextual capacity in terms of availability of resources, both material and human.

1.4.4 Mzuni as a dual university

Mzuni is the second public university in Malawi after the UNIMA. It was established by an act of Malawi Parliament in 1997. The rationale for its establishment was to increase and broaden access to university education in Malawi after noting that the UNIMA, since 1965, had limited capacity to admit all qualifying students from secondary schools due to a lack of classroom and bed space (Chibambo, 2009, 2023; Msiska et al., 2013; Mzuzu Annual Report, 2015). At its establishment, Mzuni, unlike UNIMA, was envisaged to offer programmes through the conventional f2f and

newer ODL delivery modes (Mzuzu University Acts and Statutes, 1997). However, in 1998, due to limited capacity, it only offered its B.Ed programmes under the Faculty of Education using the f2f delivery mode. Worse still, the Centre for Open and Distance Learning (CODL) was only established in 2006 following the official proposition and adoption in 2004 of ODL as a means for increasing and broadening access to university education in Malawi and the entire SADC region (SADC, 2004).

1.4.4.1 Mzuzu University's ODL model

The Mzuni ODL model is hybrid in nature (Msiska et al., 2013). Hybrid models of distance education are those models that predominantly use one mode of distance education with the integration of other technologies of delivering distance education (Burns, 2023). Mzuni's ODL model is predominantly distance using print-based teaching and learning technologies supplemented by short (four week) f2f residential sessions supported by print-based instructional materials called modules. Sometimes, where the print version of the module is not available, audio-visual materials are used. These are materials that capture the lecturer's voice talking to the PowerPoint slides (notes) using the Camtasia software. The four-week f2f residential sessions are aimed at preparing the students for self-study.

Mzuni's ODL model targets a wide audience of students in terms of student profiles/characteristics, learning needs and study backgrounds. Due to this student diversity and Mzuni's ODL mandate of broadening and increasing access to university education to all deserving Malawians (Mzuni ODL Policy, 2021), double entry and double exit strategies were adopted. This was aimed at responding to the study needs of the diverse grouping of students in Malawi.

It should further be acknowledged that although the distance learning programmes being offered at Mzuni are termed as ODL, it is not necessarily open. What is evident from practice is that a distance learning programme is characterised by some degree of flexibility in terms of study duration, student enrolment and student progression and graduation (Burns, 2023). Mzuni's ODL programme uses a fixed-term and not self-paced strategy in terms of student progression as there is a specific time for the start and end of the semester. However, there is a provision of a fall back (students being allowed to join the junior cohort) when a student fails to progress to the next year

of study or semester with cohort mates. This signifies a cohort-based learning model and not an individual or solo-based learning model.

The other feature that is seen is how the student enrolment is done at Mzuni. Mzuni admits into the ODL programmes only those students who meet the requirements for admission into Malawian universities as determined by the Malawi National Council for Higher Education (Malawi NCHE, 2016). This means that although Mzuni's ODL programmes claim to be open, they are to some extent closed considering the way students are admitted into its programmes.

The hybrid distance learning model of Mzuni calls for the unique structuring of the curriculum which makes hybridisation in terms of pedagogy and technology use possible. Further to the above, the infrastructural status of the country, Malawi, remains underdeveloped telecommunication wise (Malawi National Statistics Office [NSO], 2018). Taking this into consideration, Mzuni, as an institution in this situation had to adopt the distance education model that would work in that specific context. This is why Mzuni adopted a hybrid model of distance education where print media or technology is the main medium of instruction supplemented with other technologies.

The Faculty of Education, which is the context of this study, offers three ODL programmes as follows: B.Ed Arts, B.Ed Languages and B.Ed Science. The students in these programmes are supported by the same academic staff that support the conventional f2f students. With the first cohort of 2011 of 34 students, it was manageable for lecturers to academically support these students without requiring additional support both during the f2f residential sessions and distance phases. However, since 2014 the situation changed following the recruitment of two more cohorts (cohorts 2 and 3). The recruitment of two more cohorts resulted in an increase in the ODL student population which has put the lecturers under pressure to academically support these extra students in addition to the f2f ones who have been there since the establishment of the university in 1997. The increase in student population further correlated to increased student attrition, repetition of courses and years of study, and poor performance. This led to the ODL Steering Committee in 2014 recommending a field facilitation support strategy. Field facilitation is an additional academic support strategy that was introduced to provide academic support to B.Ed Science students. Initially, field facilitation was recommended to academically support both arts and

science students studying through ODL, but due to capacity constraints this was to be initially limited to the B.Ed Science with its very high problems of attrition, repetition and non-progression.

1.4.4.2 How the ODL curriculum is structured and delivered at Mzuni

There are currently three faculties offering their programmes through ODL, namely, Faculty of Education, Faculty of Humanities and Social Sciences and Faculty of Tourism and Hospitality Management. However, the focus of this study is on the Faculty of Education and in the B.Ed Science programme under the ODL mode of delivery. Both modes of delivery (f2f and ODL) offer the same content in the B.Ed Science programme. What is significantly different in the two modes of delivery are the duration of the programme delivery and the timing of the teaching practicum.

The B.Ed Science programme under the f2f delivery mode lasts four years while the same programme under the ODL mode of delivery lasts five years. The other difference is that the f2f B.Ed Science programme has two entry points and one exit point i.e., entry at either year one (generic students) or year two (upgrading) and exit at year four. However, in the ODL delivery mode, the same B.Ed Science programme has two entry and exit points. Students may join at either year one (generic) or year four (upgrading) and exit either at year three (generic) or year five (generic and upgrading). Those that exit at year three exit with a Diploma in Education while those that exit at year five exit with Bachelor of Education (Science).

Teaching practicums in the two modes of delivery take place differently. Teaching practicum in the f2f delivery mode takes place towards the exit point of the B.Ed Science programme while in the ODL mode of delivery, it takes place towards the end of the first exit point (Diploma in Education). It is argued that those exiting after three years (with a Diploma in Education) have both adequate content mastery and pedagogical skills to teach Science and Mathematics in Malawian secondary schools. The other reason is that since the demand for Science and Mathematics teachers is high in secondary schools, graduating such teachers earlier than four (f2f) or five (ODL) years would be an immediate solution to Science and Mathematics teacher shortages in secondary schools.

Despite the acute shortage and high demand for Science and Mathematics teachers in secondary schools, the ODL mode of delivery seems to be failing as a solution to meet this high demand for

Science and Mathematics teachers as the majority cannot persist to graduation both at diploma and degree levels. Field facilitation (tutoring) was therefore introduced as a learning support strategy in the B.Ed Science programme to enhance learning and success rates. Field facilitation as a learning support strategy in the Science and Mathematics teacher education programme will be discussed in Chapter Two, Section 2.9.

This study honed in on the B.Ed Science programme, which besides being academically supported by lecturers, is also academically supported by the field facilitators popularly known as tutors. Both the lecturers and the field facilitators provide academic support and are recognised by Mzuni as having this responsibility (Mzuni ODL Steering Committee Minutes, 2014). This support is provided when the students are on campus and/or at home (distance phase). On-campus academic support is provided formally by the lecturers, while the academic support during the distance phase is provided by both lecturers and field facilitators in designated study centres called Satellite Learning Centres.

The field facilitation academic support strategy was initially not incorporated in the design of the ODL academic support strategy. Mzuni's focus on the introduction of ODL programmes was to address the issue of access (Chimpololo, 2010; Msiska et al., 2013). The question of how the students would be supported to ensure optimal learning experiences and success was inadequately explored and probably largely overlooked in deliberations about how ODL might allow for a greater student intake. Field facilitation was introduced in the B.Ed Science programme after observing that failure rates in Science and Mathematics courses were particularly high compared to arts courses in the B.Ed Arts programme.

1.5 The Mzuni Field Facilitation Model (The Focus of the Study)

Open and Distance Learning (ODL) tuition at Mzuni in the Science and Mathematics teacher education programme takes place in two phases, namely, the module orientation phase and the distance learning phase. The module orientation phase takes place on the university campus where lecturers introduce the modules (study content) for the semester to the students. The face-to-face mode of instruction is used during the module orientation phase which lasts for four weeks. Following the module orientation phase is the distance learning phase which takes place off-

campus as mentioned earlier in Section 1.4.4.1. Students are expected to independently study the module contents during the distance phase of the semester. Seeing that independent study was a challenge during the distance phase of the semester particularly in the B.Ed Science programme, field facilitation (tutoring) was introduced. Field facilitation was introduced as a learning support strategy to Science and Mathematics student teachers in the B.Ed Science programme under the ODL mode of delivery which was aimed at enhancing their learning experiences and success.

Mzuni field facilitation is predominantly done through the face-to-face mode with the aid of some technologies such as print (Mzuni ODL instructional modules), handouts (where the module is not available), audio and video technologies in the form of audio recordings using Camtasia, mobile technologies using SMS, voice notes and video recordings using a social media application (WhatsApp). However, to a larger extent, Mzuni's field facilitation model is hybrid as it largely makes use of the face-to-face mode of instruction with some traces of technology use.

Since the introduction of the field facilitation academic support strategy by the ODL Steering Committee in 2014, no audit has been conducted to assess its impact on the learning experiences of ODL Science and Mathematics students. Moreover, the recommendation to introduce the field facilitation academic support strategy was based on anecdotal research. Furthermore, records available at the Mzuzu Academic Office reveal low throughput rates in Science and Mathematics compared to arts even after the introduction of field facilitation (Mzuzu Academic Office, 2018).

1.6 Research Questions

The main aim of this study was to understand epistemic injustice committed in higher education systems, particularly in non-traditional ODL programmes where physical access to the higher education institution is favoured but neglects real epistemic access to the knowledge production processes of the higher education disciplines. The situation is particularly worse in Science and Mathematics disciplines where studying through distance has proved difficult. However, in the context of this study, the field facilitation strategy was proposed as an intervention that would enhance epistemological access of ODL students in Science and Mathematics disciplines that would eventually result in student learning and success in the B.Ed Science programme under the

ODL mode of delivery at Mzuzu University in Malawi. However, student failure has persisted, hence the study and the research questions that follow:

1. What field facilitation strategies are currently being used in the B.Ed Science programme?

2. How effective have current field facilitation strategies been in enhancing learning and success in Science and Mathematics?

3. How could the current field facilitation strategies be improved to enhance learning and success in Science and Mathematics?

As I indicate in the next chapter, answering these questions will allow me to make a contribution to some of the key deliberations in the literature on ODL. In particular, this Mzuzu University ODL B.Ed Science programme case study will allow me to contribute to discussions about the nature of ODL in Science and Mathematics disciplines in resource-constrained contexts.

1.7 Outline of the Thesis

Chapter One discussed the context and rationale of the study. It also included my motivation for conducting the research in a field where I have had varied experiences and have come to develop questions about how ODL students are supported. It also discussed the research problem and why this study was needed and how it contributes to larger debates about the ways in which students who are studying through ODL might be supported in their learning process. It also included the rationale for the study and research questions. Finally, it introduced the research site and the key terms/concepts and context that informed the study.

Chapter Two is the review of literature on ODL. It broadly contextualises the study in the global forces influencing higher education particularly open and distance education. Such forces include globalisation, neoliberalism, massification of higher education and the rise of the knowledge economy. However, it particularly focuses on the state of field facilitation (tutoring) practices in Science and Mathematics disciplines in teacher education programmes in institutions of higher education (universities) in resource-constrained ODL contexts. It also discusses the ODL pedagogical theories that informed the study and highlights the field facilitation (tutoring) models which have been adopted in other higher education institutions.

Chapter Three focuses on Cultural-Historical Activity Theory (CHAT), the theoretical framework that informed the research methodology, data collection and analysis. The chapter discusses four generations of Activity Theory; however, for the purposes of this study, the second-generation Activity Theory was focused on. The chapter also elaborates on the concept of the Zone of Proximal Development (ZPD) (Vygotsky, 1978) and the concept of expansive learning (Engeström, 2003). It addresses the relationship between the ZPD and expansive learning with a particular focus on contradictions that emerge in the field facilitation activity system as a manifestation of the underlying tensions within Mzuni as a system. It further looks at the revelation of such contradictions as expansive learning and that such expansive learning occurs in the ZPD of the participants or actors in the activity system both individually and collectively.

Chapter Four discusses the research methodology for the study. It discusses the research design process which includes data collection, data processing and analysis and considerations of trustworthiness and validity. Ethical considerations are also detailed. Data generation for the study was conducted in two phases. These were the contextual profiling phase and Change Laboratory Workshops. The contextual profiling phase included the surveys for students, focus group interviews with students, one-on-one interviews with field facilitators, one-on-one interviews with lecturers teaching Science and Mathematics in the ODL B.Ed Science programme and document analysis. The contextual profiling data constituted the mirror data for the second phase of data generation, the Change Laboratory Workshops. The Change Laboratory Workshops were modified due to Covid-19 restrictions. Instead of doing the Change Laboratory Workshops in person, they were done through the social media application “WhatsApp”. The modified Change Laboratory Workshops did not bring out the complete expansive learning as I expected. The data in the Change Laboratory Workshops enabled limited expansive learning up to the third stage of the expansive learning cycle, modelling. However, though limited in authentically bringing out expansive learning, there was some expansive learning as evidenced in the discussions suggesting improvements in the field facilitation activity system.

Chapter Five is the first part of the findings of the research. It examines the current field facilitation strategies in the B.Ed Science programme under the ODL mode of delivery at Mzuzu University. This chapter responds to research questions 1 and 2: *What field facilitation strategies are currently*

being used for Science and Mathematics teacher trainees in the B.Ed Science programme studying through the ODL mode of delivery? and *How effective have current field facilitation strategies been in enhancing learning and success among Science and Mathematics students in the B.Ed Science programme studying through the ODL mode of delivery?* In this chapter, field facilitation activities at Mzuni are contextualised and theorised. The CHAT is used as a theoretical lens in the understanding of the field facilitation activity system at Mzuni. Also, Chapter Five surfaces contradictions within the field facilitation activity system through data presentation and discussion which are unpacked in Chapter Six.

Chapter Six is the second part of the research findings. It discusses the contradictions in the field facilitation activity system at Mzuni. This chapter responds to the research question 3: *How could the current field facilitation strategies be improved to enhance learning and success among Science and Mathematics students in the B.Ed Science programme studying through the ODL mode of delivery?* The contradictions are thematically categorised and reported as institutional insensitivities to the underlying ODL issues and the contradictions that surfaced are the manifestations of such deep-seated underlying issues.

Chapter Seven concludes the entire thesis. It highlights the key findings of the study. It also indicates the implications of the study generally and in resource-constrained contexts. It also makes suggestions for the possibilities for future study particularly in this specific ODL context using the latest versions of CHAT to understand the context better.

1.8 Conclusion

This chapter discussed my personal history and motivation that led to the pursuit of the study. The chapter also included the background, context and rationale of the study. To this end, the chapter highlighted the global, regional and local (Malawian) developments and contexts in the provision of ODL and the issues in higher education with a specific focus on pre-service teacher education through ODL. This brief discussion of the context of ODL provision at Mzuni will be expanded in Chapter Two which discusses ODL practice globally and in the African context in more detail.

CHAPTER TWO: DISTANCE LEARNING IN HIGHER TEACHER EDUCATION

2.1 Introduction

Education is generally seen as a catalyst for national development. Governments, therefore, drive increased access to university education (Aluede et al., 2012). One of the means for increasing access to university education has been the introduction of ODL. Because of financial constraints being faced by universities in developing countries, universities have turned to distance education but often without considering the distinctions between pedagogy for ODL or for f2f programmes (Muyinda, 2012).

The preceding chapter discussed the context and rationale of this study by exploring the Mzuni field facilitation learning support pedagogy. This chapter, Chapter Two, examines the concept of higher education (the nature of demand, access and success in higher education), the concept of ODL (the modes and models of distance education that have influenced the higher education sector in terms of curricula structuring and delivery), the need for robust learning support in the ODL delivery and how field facilitation could be used in supporting learning and success.

2.2 Widening Access to Higher Education

The rise in demand for higher education and the creation of opportunities for wider participation in higher education (Wood & Breyer, 2017) has led to a massification in student numbers and a broadening of types of higher education.

Calls to widen participation so that students from a wide spectrum of socioeconomic and cultural backgrounds can participate in higher education have been made as a result of concerns for social justice and the sake of equity and not just from a position related to the need for increased participation in the global economy. University leaders thus face the difficult task of balancing efficiency and the need to contribute to the global economy with equity in the sense of providing higher education to a wider range of students.

The challenge in a massified system goes beyond accommodating large classes and managing large universities to include dealing with the diversity the numbers bring (Walker et al., 2022). If we believe that higher education has the potential to contribute to the wellbeing of societies through the production of research and graduates who can contribute to critical discourse and, thus, to democracy itself, the idea of widening participation is crucial. All this needs to be done in universities where reduced funding has led to poor-quality infrastructure and scarcity of resources.

In the context of reduced funding to higher education, UNESCO's role has mainly been facilitative, aimed at assisting, supporting and complementing the national efforts of member states to eliminate illiteracy and extend education (Mingst, 2020). The UNESCO has a mandate in higher education and places a special focus on inclusion, the recognition of qualifications and quality assurance, particularly in developing countries. Their mandate within the UN requires it to defend and promote the idea of equality of opportunity within an increasingly globalised higher education policy arena. Its own constitution also requires UNESCO to promote the sharing of knowledge and to defend cultural diversity (Mundy & Madden, 2010).

According to the World Bank, higher education is in crisis throughout the world with regard to low quality because of rapid enrolment growth under conditions of limited resources; inefficiency, with regard to inappropriate use of public resources in higher education, high dropout rates and programme duplication; and inequity, because public subsidies as a proportion of unit costs of higher education often far exceed the subsidies to primary and secondary education (Hazelkom et al., 2018; Kent, 1996). Tilak (2006), however, stresses that given the high status that higher education receives as a public good, no substitute will be found for government funding of higher education. The UNESCO has spoken against the World Bank's suggested use of the limited concept of rates of return as a guide for funding policies. Therefore, UNESCO calls for increased public and private investment in higher education that would allow for a renewal of enrolment growth in the sector (Canlas, 2016).

But access alone is not enough. Many higher education writers and researchers have described the "the revolving door" situation which occurs when institutions accept all students but do not do enough to help them achieve success (Boughey & McKenna, 2021; Clarence, 2021).

Unfortunately, students from lower socioeconomic groups attend and thrive in higher education in far lower numbers than their more privileged peers (Mukwambo et al., 2021).

Around the world, there is a strong correlation between social class and higher education success (Boughey & McKenna, 2021), which raises questions about whether widened access is enough to achieve social justice. Universities can serve both as economic development and social justice agents and are, therefore, significant for human development (Walker et al., 2022). Higher education continues to be portrayed as a vehicle for producing human capital for national and international wealth creation in a world becoming increasingly characterised by technology-dependent knowledge economies (Castells, 1996, 2015). A recent study of low- and middle-income countries (Howell et al., 2020) found that universities contribute to sustainable economic development locally and nationally, but do less well on social development and inclusion.

2.3 The Rise of the "Knowledge Economy"

As value has always been placed on higher education as a means to achieve economic prosperity, another discursive shift has occurred where little value is given to the nature of knowledge itself. This shift in thinking has been accompanied by the fact that the universities, as knowledge producers, have the means of creating knowledge which could lead to profits in this new "knowledge economy". Rather than being a public good and existing for the good of humankind, knowledge increasingly has come to be understood as a commodity, a private good (Williams, 2016), with the potential to benefit those who have it or who can generate it.

This so-called "commodification of knowledge" is then related to other discursive moves and to developments in the structural domain of knowledge production. If knowledge is understood to carry monetary value for individuals, rather than being a broader good in service of the public at large, then the need for the state to provide funding for the universities that produce it falls away (Pankoya & Khaldeeva, 2017). So, too, does the need for the state to fund the students seeking this knowledge. If students will be the beneficiaries of this knowledge commodity, the logic goes then that the students should pay for it. All this leads to neoliberal discourses arguing for reduced state funding for higher education and students. These shifts in the world of ideas then allow for developments in the form of policies and new funding mechanisms.

2.4 Neoliberalism and Higher Education

The literature on neoliberalism typically focuses on free-market capitalism and, thus, the reduction of any form of control on economic activity conducted by individuals, companies, organisations and governments. The deregulation of economic activity in most of the world has been accompanied by the privatisation of state entities, a phenomenon seen most clearly in post- Soviet Russia where the so-called "oligarchs" were alleged to have bought up oil companies and other entities previously owned by the state, often very cheaply (Hollingsworth & Lansey, 2009). The same privatisation philosophy has emerged in the higher education sector. This does not necessarily mean that higher education institutions have been bought, but that governments have slightly pulled out of the management of higher education institutions by engaging state organs to manage higher education functions on behalf of them in the name of councils with the slogan of improving efficiency. The blending of economic principles related to the supposed desirability of the free market with principles of managerial supremacy has led to shifts in governance authority of the higher education institutions from the professoriate towards the university councils with compositions that resemble those of the private sector (Nampota, 2015).

Those hired to manage these higher education institutions promise to possess attributes of managers capable of ensuring efficiency in the management of higher education institutions. This has resulted in such managers squeezing the available human and material resources in the university to produce results. For example, most ODL institutions have emerged using the very same resources meant for f2f teaching and learning and ODL programmes have as a result been mainstreamed and centralised as opposed to making them autonomised and decentralised.

Across the world, higher education has faced reduced funding after the 1980s. This shift reversed developments that had taken place from the end of the Second World War aimed at broadening access to what had been perceived as a public good, closely tied to national development and social cohesion. The thinking now was that if students wanted to gain a qualification which would allow them access to the private goods achieved by competing in the global economy, they needed to pay substantially towards the cost of that qualification (Brown & Carasso, 2013). As a result, responsibility to pay ever-increasing tuition fees began to be placed on students who had

previously either only paid minimal fees or, in the case of those receiving state grants, had received free higher education.

Associated with discourses promoting globalisation, therefore, we see an increase in neoliberal ideas in the form of a shift away from the welfare state that characterised the period after the Second World War to the discourse of the free market, where individuals were expected to take care of their own needs. The development of neoliberal policies, through which state funding was reduced, also resulted in an opening up of opportunities for private enterprise. Private universities have always existed, but the latter half of the 20th century saw a growth in private provision in many countries, including in developing countries (Qureshi & Khawaja, 2021). This then led to very different experiences on the part of students, parents, staff and other stakeholders in higher education systems. For example, a phenomenon widely reported in some countries (e.g., Neves & Hillman, 2018) was the expectation that a university should be judged according to its value for money. Students' experiences of a university were thus often those of consumers of a product. In many respects, universities have responded to this by privileging tools to gauge student satisfaction and even their perceptions of value for money (Gyamera & Burke, 2018).

The introduction of ODL in higher education institutions is a strategy by these institutions to achieve growth and ensure value for money where it is assumed that there will be mass dissemination of knowledge and skills beyond the constraints of classroom and bed spaces (Blin, 2022). However, the introduction of the ODL mode of delivery of instruction requires novel means of teaching and learning but this is rarely fully understood. What is, however, observed is business as usual where ODL teaching and learning mirrors traditional ways of teaching and learning.

2.5 Open and Distance Learning as a Solution to Demand for Higher Education

While ODL has often been implemented to address issues of the so-called knowledge economy and is often accompanied by government policies and strategies to drive it (as in the case of Malawi as discussed in Chapter One), it is important to note that for many of its adherents, there is a strong social justice imperative underpinning ODL. The open aspect of ODL refers to its abilities to overcome various barriers in place for f2f education. However, the practice on the ground is that barriers to accessing and participating meaningfully in higher education still exist. Such barriers

are at varying levels – individual, instructional and institutional (Musingafi et al., 2015), such as finances and being unable to study full-time, barriers of geographic distance as ODL allows people in rural areas far from a university building to participate in higher education and barriers of (dis)ability, among others.

Despite the demand for higher education globally, access and participation in developing countries still remains low (Chivwara, 2013; Kayange, 2021; Nage-Sibande & Murolong, 2018). As the student body massified it became more diversified and came to comprise students from a wide array of social and cultural backgrounds rather than from the elite classes who had traditionally enjoyed almost exclusive access to higher forms of learning (Boughey & McKenna, 2021). This widening and diversification of access requires serious stakeholder preparation to go beyond guaranteeing access and equity to ensure success (Clarence, 2021). As Boughey and McKenna (2021) argue, the low retention and success rates are often explained simply at an individual level as students being unprepared for university study with little regard paid to institutional barriers.

The response to increased demand for higher education alongside low funding being available from the state has often been the introduction of ODL. Open and Distance Learning (ODL) is also becoming increasingly common with the rise of technology and its educational affordances. Many argue that the distinction between f2f and online has become nonsensical as almost all educational programmes now include online aspects which can be engaged with from a distance (Heydenrych & Prinsloo, 2010). This is particularly the case after the rapid pivot to emergency remote teaching during the Covid-19 pandemic (Mncube et al., 2021).

The deliberations about ODL now generally focus on the use of technology and assume that ODL is largely or exclusively online. This literature largely neglects resource-constrained contexts such as that of this study, where there is limited access to technology and the Internet. There is thus a need for research that considers such contexts where paper-based education remains the dominant ODL format. This is particularly critical in the context of developing countries where a large portion of the community is rural with little or no telecommunication technologies (Nage-Sibande & Morolong, 2018). Quality mass dissemination of ODL programmes remains a challenge in such a context (Ngubane-Mokiwa & Letseka, 2015). Fortunately, the popularisation of ODL globally

has been seen as an opportunity for prospective students who could not access higher education before.

2.6 Open and Distance Learning and Epistemological Access

Rambe and Mawere (2011) term epistemological access as a process of initiation or socialisation into the discourses and practices of the discipline. It is further argued that learning is inherently a social practice (Boughey & McKenna, 2021). Not only do we learn through interactions with each other, but knowledge emerges through human practices. The knowledge practices (and related reading and writing practices) of each discipline are neither obvious nor common sense and so careful induction is needed. Morrow (2009) argues that widening physical access to higher education is not sufficient. Students need epistemological access if they are to succeed. Epistemological access is access to the disciplinary ways of making knowledge. Morrow (2009) argues that this cannot simply be given to students, they have to actively engage to achieve epistemological access; however, we can plan curricula and learning opportunities that make epistemological access more likely.

Concerns about the social nature of learning and the isolation of ODL raises concerns about the extent to which academic practices which students would be inducted into in f2f learning could be lost in ODL. The need for more explicit scaffolding and opportunities to cultivate academic practices in ODL is paramount. Open and Distance Learning (ODL) that is low or no tech means that such scaffolding and practice opportunities have to be carefully planned and curriculated and cannot be developed "on the fly" during synchronous online sessions. The popularisation of the use of technology in ODL teaching and learning is often insensitive to social human learning practices in resource-constrained contexts (Devkota, 2021). This is what Dipitso et al. (2022) term an issue of material accesses to higher education institutions in developing countries where epistemological access remains a challenge.

As universities take on the responsibility for facilitating epistemological access, they need to question why certain practices are privileged in our lecture halls and examination processes while others are dismissed or ignored. Herein lies a tension that Janks (2014) calls the "access paradox". In scaffolding students' access to the dominant literacy practices of the discipline, universities are

reinforcing this dominance. In an age where many are raising questions about whose forms of knowledge are dominant and which knowledges are silenced, teaching in ways that enhance access to disciplinary practices requires a simultaneous consideration of other ways of being and doing. We need to not only make the powerful ways of being and doing in our disciplines accessible to our students, but we also need to teach in ways that create spaces sensitive to context and social situations for critique of these.

Unfortunately, the dominant discussions about student success and failure do not often take wider context into account. There is often little concern with wider social issues that impact education or with the ways in which the curriculum and pedagogy have scaffolded epistemological access. Students' success and failure is commonly explained in terms of the attributes inherent within them as individuals, such as intelligence, motivation and aptitude (Boughey & McKenna 2016, 2017). Understanding the student as a social being, the university as a social space and literacy practices as socially constructed has profound implications for teaching and learning. In contrast to the notion of teaching as simply the neutral dissemination of knowledge, in a social understanding, academic teachers are not simply imparting knowledge, but rather they are inducting students into the norms and values, and the emergent knowledge-making and literacy practices of the field which recognises the context of the students. It is with this understanding of education as a social practice and students as social beings that I sought to interrogate ODL.

2.7 Models of Distance Education

Burns (2023) identified different models and modes of distance education. These modes and models have been influenced by the evolution in technologies in the field of distance education. The Commonwealth of Learning came up with single, dual, corporative/consortia and hybrid modes of distance education institutions (Macdonald, 1999). Mzuni, the context of this study, is a dual-mode university by mandate from its establishment as discussed in Chapter One. Within these modes of institutions, one can find a number of different models of distance education. Much of the distinction between these models relates to the form and extent of technology used.

Technologically, distance education has evolved through six models: correspondence, audio-based, televisual, computer-based multimedia, web-based and mobile (Burns, 2023). The

correspondence model of distance education is predominantly print based. The proliferation of a postal service made education through correspondence possible beyond the physical boundaries of university campuses (Caruth & Caruth, 2013). Aiming at bringing social justice and equal opportunities to educational access and taking advantage of the developments in communication systems, a variety of organisations adopted the correspondence education (Simpson & Anderson, 2012; Simonson et al., 2015). The six models of distance education have been summarised in Table 2.1 below.

Table 2.1: Models of Distance Education

Models of Distance Education	**Examples**
Correspondence model	• Print technologies
Audio-based models	• Broadcast: Interactive Radio Instruction (IRI) o Narrowcast: Interactive Audio Instruction (via audio tape or CDs) • Two-way radio • Audio conferencing and telephone • Broadcast radio
Televisual models	• Broadcast television (educational and instructional) • Video conferencing • Video
Computer-based multimedia models	• Interactive video (disc and tape) • CD-ROMs • Digital videodiscs (DVDs/VCDs) • Interactive multimedia

Web-based models	• Computer-mediated communication • Internet-based access to World Wide Web resources • Online courses (e-learning) • Online conferences (webcasts and webinars) • Virtual classes/schools (cyber schools) and universities
Mobile models	• Handheld devices • Portable media players (podcasting) • Cell phones and smart phones • Tablets • E-readers

Source: Burns (2023)

Institutions, either in developed or developing countries, have adopted or adapted one model or a combination of several models depending on their needs and infrastructural status. As indicated in Chapter One, Mzuni, an institution in a developing country adopted the hybrid model of distance education, though it is the correspondence model of distance education that predominates.

Heydenrych and Prinsloo (2010) developed the table that follows to outline the key features of each model of distance learning. In essence, they have summarised the key feature of six different models of distance learning: Correspondence Models; Audio-based Models; Televisual Models; Computer-based Multimedia Models; Web-based Models; and Mobile Models. Under each model, they note the key features of each model, the pedagogical approach and form of curriculum, and details regarding materials, storage, communication, student interaction and so on. The full table can be found in Appendix 1. Heydenrych and Prinsloo (2010) suggest that different models of distance learning lend themselves to different learning theories, though they indicate this is not a completely necessary relationship because models can be adapted and implemented in various ways. I now turn to consider these learning theories with reference to ODL.

2.8 Learning Theories and Open and Distance Learning

Pedagogy is the art or science of teaching and learning. Some form of pedagogy will result in learning while others will not. Those pedagogical approaches that result in student learning can be referred to as 'developmentally appropriate' (Rogers & Sluss, 2008). The term 'developmentally appropriate' is typically associated with children's learning, which is an oversight because humans learn throughout their life (Laal & Salamati, 2012). Developmentally appropriate pedagogy is a prerequisite to the successful inclusion of all students considering their diverse contexts, backgrounds, learning needs, styles or challenges (Kanwar & Cheng, 2017).

2.8.1 Cognitive-behaviourist pedagogy of distance education

Cognitive-behaviourist pedagogy is a combination of two learning theories namely cognitivism and behaviourism. Cognitive and behaviourist pedagogies focus on the way in which learning was predominantly defined, practiced and researched in the latter half of the 20th century. Behavioural learning theory begins with notions of learning which are generally defined as new behaviours or changes in behaviours that are acquired as the result of an individual's response to stimuli (Akpan, 2020). Correspondence education, as some have argued, is underpinned by a behaviourist approach, assuming that the student would be guided autonomously through the materials (Anderson & Dron, 2011). In this learning theory, the focus is on the individual and the necessity for measuring actual behaviours rather than attitudes or capacities. This theoretical idea led to instructional designs and interventions such as computer-assisted instruction and instructional systems designs that took students through various steps. For example, Gagne's nine events of instruction, Keller's ARCS-V model of instructional design and Smaldino's ASSURE model.

Behaviourist notions have been especially attractive for use in training as the learning outcomes associated with training are usually clearly measured and demonstrated behaviourally. Critics of behaviourism have noted that unlike training, education is often not linear, includes personal affective issues and can be difficult to measure. From the behaviourist tradition emerged the cognitive revolution, beginning in the late 1950s (Robins et al., 2019). Cognitive pedagogy arose partially in response to a call to account for motivation, attitudes and mental barriers that may only be partially associated or demonstrated through observable behaviours.

Cognitive models were based on a growing understanding of the functions and operations of the brain and especially the rise in ways in which computer models were used to describe and test learning and thinking. Much research using this model proceeded from empirical testing of multimedia effects, cognitive overload, redundancy, chunking, short- and long-term memory and other mental or cognitive processes related to learning (Anderson & Dron, 2011). Although learning was still conceived of as an individual process, its study expanded from an exclusive focus on behaviour to changes in knowledge or capacity that are stored and recalled in individual memory. The tradition continues with the successful application of experimentally verified methods like spaced learning (Fields, 2005) and applications of brain science as well as more dubious, scientifically unsound and unverifiable learning style theories (Coffield et al., 2004) that achieved popularity towards the end of the twentieth century and that still hold sway in many places today. The control in a cognitive-behaviourist model is very much the teacher or instructional designer who designs the steps to be followed by the students with the assumption that this will lead to individual learning.

It is notable that such models gained a foothold in distance education at a time when there were few technologies that allowed many-to-many communication. Teleconferencing was perhaps the most successful means available but came with costs and complexity that limited its usefulness particularly in developing countries.

Cognitive presence is a concept often used to measure the quality of an online learning experience (Boston et al., 2010). Cognitive presence is the extent to which learners construct and confirm meaning through which they construct new knowledge. Cognitive presence is understood to be created through structured processes in which students' interest is stimulated, informed by both general and specific cases of overriding principles and then tested and reinforced for the acquisition of this knowledge. Later developments in cognitive theory have attempted to design learning materials in ways that maximise brain efficiency and effectiveness by attending to the types, ordering, timing and nature of learning stimulations (Anderson & Dron, 2011). Cognitive-behaviourist models of distance education pedagogy thus stress the importance of using an instructional systems design model where the learning objectives are clearly identified and stated and exist apart from the student and the context of study.

What most defined the cognitive-behavioural generation of distance education was an almost total absence of social presence. Learning was thought of as an individual process, and thus it made little difference if one was reading a book, watching a movie or interacting with a computer-assisted learning programme by oneself or in the company of other students (Oztok, 2014). This focus on individualised learning resulted in high levels of student freedom (space and pace) and fitted well with technologies of print packages, mass media (radio and television), and postal-correspondence interaction. It is also interesting to note the backlash against distance education that arose among traditional campus-based academics, partially in reaction to this individualised affordance.

Teaching presence in distance education undertaken from a cognitive-behavioural perspective was also reduced or at least radically reconstructed. In its earliest form of correspondence education, the teacher had only their words on printed text to convey their presence. Holmberg (2020) describes a style of writing that he called guided didactic interaction which, through personalisation and a conversational writing style, was supposed to transmit the personality and caring concern of the teacher. Later technologies allowed the voice (audio) and body language of the teacher to be transmitted through television, film and multimedia-based educational productions. Despite the general absence of the teacher in cognitive-behaviourist pedagogies, one cannot discount the teaching presence that potentially could be developed through one-to-one written correspondence, telephone conversations or occasional face-to-face interactions between teachers and students. Despite this potential, the teaching-presence role is unclear in distance learning from a cognitive-behaviouralist perspective in that the pedagogy is seen to be self-contained and complete, generally requiring only teacher-student interaction for marking and evaluation. No doubt some distance education students using this model experience high levels of teaching presence, but for many, teaching presence is minimally mediated through text and recorded sound and images. This reduction of the role of the teacher fuelled resentment by traditional educators against the cognitive-behaviourist model of distance education (Garrison, 2009) who felt that the mediating role of the teacher was being undermined.

To summarise, cognitive-behaviourist models largely undermined the first generation of individualised distance education. They maximised access and student freedom, and were capable

of scaling to very large numbers at significantly lower costs than traditional education, as demonstrated by the successful mega-universities (Daniel, 1996). However, these advantages were accompanied by very significant reductions in teaching, social presence and formal models of cognitive presence. This approach has thus come under serious challenge since the latter decades of the 20th century. While appropriate when learning objectives are very clear, cognitive-behaviourist models arguably avoid dealing with the full richness and complexity of human learning and emphasise learning "to do" rather than "to be" (Bansal, 2016). In contrast to the individual focus of cognitive-behaviourist theories of learning are social-constructivist understandings.

2.8.2 Social-constructivist pedagogy of distance learning

While there is a tradition of cognitive-constructivist thinking that hinges on personal construction of knowledge, largely developed by Piaget and his followers (Piaget, 1970), the roots of the constructivist model most commonly applied today come from the work of Vygotsky and Dewey, generally considered together in the broad category of social constructivism. Social-constructivist pedagogies, perhaps not coincidently, developed in conjunction with the development of two-way communication technologies. At this time, rather than simply transmitting information, there was a move to use technology to create opportunities for both synchronous and asynchronous interactions between and among students and teachers. Michael Moore's famous theory of transactional distance (1989) notes the capacity for flexible interaction to substitute for structure in distance education development and delivery. Researchers have noted the challenges of getting the mix of interactions right (see Anderson, 2003; Daniel & Marquis, 1988). Social-constructivist pedagogy acknowledges the social nature of knowledge and simultaneously of its creation in the minds of individual students. Teachers do not merely transmit knowledge to be passively consumed by students; rather, each student constructs new knowledge and integrates this with their existing knowledge. Although there are many different understandings of social constructivism (see Kanuka & Anderson, 1999), all have more or less common ideas, including the importance of:

- new knowledge as building upon the foundation of previous learning;
- context in shaping students' knowledge development;

- learning as an active rather than passive process;
- language and other social tools in constructing knowledge;
- metacognition and evaluation as a means to develop students' capacity to assess their own learning;
- learning environment as needing to be learner-centred and including multiple perspectives; and
- knowledge needing to be subject to social discussion, validation, and application (from Honebein, 1996; Jonassen, 1991; Kanuka & Anderson, 1999).

As Greenhow et al. (2009) and others have argued, learning is located in contexts and through relationships rather than only in the minds of individuals. The locus of control in a social-constructivist system shifts somewhat away from the teacher, who becomes more of a guide than an instructor, but who nonetheless assumes the critical role of shaping the learning activities and designing the structure in which those activities occur. Social-constructivist theories are less easily translated into theories of teaching than cognitive-behaviourist theories. It is notable that social-constructivist models only really took off in distance learning when the technologies of many-to-many communication became widely available. First, this was largely through email and bulletin boards, and later, through the Internet and mobile technologies. While such models had been waiting in the wings for distance education since Dewey, their widespread use and adoption in distance learning needed the widespread availability of technologies, many of which remain limited in the Global South.

Constructivists emphasise the importance of knowledge being constructed to have individual meaning. Thus, cognitive presence in this pedagogical approach is located in as authentic a context as possible. This can be a challenge in distance learning where material designers and teachers may not be fully aware of their students' contexts. Constructivism assumes students are actively engaged, and interaction with peers is perhaps the most cost-effective way to support cognitive presence (not requiring the high costs of simulations, computer-assisted learning programming or media production). Cognitive presence, for constructivists, also draws on the human capacity for role modelling (Bandura & Walters, 1977; Devi et al., 2017), imitation (Warnick, 2008), and

dialogic inquiry (Wegerif, 2007). However, this focus on human interactions placed limits on accessibility and produced more costly models of distance education (Annand, 1999).

At a distance, these human interactions are always mediated, but nonetheless, they are considered to be a critical component of quality distance education (Garrison, 1997). Much research has been undertaken to show that quality interaction and subsequent social presence can be supported in both synchronous and asynchronous models of distance education. More recent developments in immersive technologies, such as Second Life, allow gestures, costumes, voice intonation and other forms of body language that may provide enhancements to social presence beyond those experienced face-to-face (McKerlich & Anderson, 2007). It is likely, as students become more acclimatised and skilled in using ever-present mobile communications and embedded technologies that barriers associated with a lack of social presence will be further reduced, allowing constructivist models to thrive. Given the realities of this study context however, this is still some way off.

Kanuka and Anderson (1999, p. 14) argue that in constructivist modes of distance education, "the educator is a guide, helper, and partner where the content is secondary to the learning process; the source of knowledge lies primarily in experiences". Teaching presence extends beyond facilitation of learning to choosing and constructing educational interventions and to providing direct instruction when required. The requirements for high levels of teaching presence make the scaling of constructivist distance education models problematic (Annand, 1999). Assessment in constructivist models is also much more complicated than in behaviourist models, as Theng and Mai (2013) have argued that the collaborative process of constructivist knowledge creation tends to be more valuable than the resulting product. Thus, teaching presence in constructivist pedagogical models focuses on the facilitative role performed by teachers in learning contexts.

Constructivist distance education pedagogies moved distance learning beyond a focus on knowledge transmission to the use of synchronous and asynchronous, communications-based learning. Thus, Garrison (1997) and others argue that the rich student-student and student-teacher interactions could be viewed as a "post-industrialist era" of distance education. However, Annand (1999) views the focus on human interaction as placing limits on accessibility and producing more costly models of distance education. Ironically, constructivist models of distance education

arguably share many of the affordances and liabilities of campus-based education, with the potential for teacher domination and restrictions on geographic and temporal access (Kuswara, 2015; McNeill & Johnston, 2013).

2.8.3 Connectivist pedagogy of distance education

The third generation of distance education pedagogy emerged more recently and is known as connectivism. Siemens and Conole (2011), Siemens (2005a, 2005b, 2007) and Downes (2019) have written defining connectivist papers, arguing that learning is the process of building networks of information, contacts and resources that are then applied to real problems. Connectivism emerges from the information age of a networked era (Banihashem & Aliabadi, 2017; Boyraz & Ocak, 2021; Castells, 2015, 1996; Gürsakal & Bozkurt, 2017) and often assumes ubiquitous access to networked technologies. Connectivist learning focuses on building and maintaining networked connections that are flexible enough to be applied to existing and emergent problems. Connectivism assumes that information is plentiful, and that the learner's role is not to memorise or even understand everything, but to have the capacity to locate and apply knowledge when and where it is needed. Connectivism assumes that much mental processing and problem solving can and should be off-loaded to machines, leading to Siemens' (2005, n.p.) contentious claim that "learning may reside in non-human appliance". Thus, connectivism places itself within the context of actor-network theory with its identification of the indiscriminate and overlapping boundaries between physical objects, social conventions and hybrid instances of both, as defined by their initial and evolved application in real life (Latour, 1993). It is worth noting that connectivist models rely on the ubiquity of networked connections between people, digital artefacts and content, which would have been inconceivable as forms of distance learning were the Internet not available to mediate the process. Thus, as we have seen in the case of the earlier generations of distance learning, technology plays a major role in the potential pedagogies that may be employed.

Connectivism begins with the assumption that learners have access to powerful networks and, as importantly, are literate and confident enough to exploit these networks in completing learning tasks. Thus, the first task of connectivist education involves exposing students to networks and providing opportunities for them to gain a sense of self-efficacy in networked- based cognitive skills and the process of developing their own net presence. Connectivist learning happens best in

network contexts as opposed to individual or group contexts (Dron & Anderson, 2012). In network contexts, members participate as they define real learning needs, filter these for relevance, and contribute to develop their knowledge creation and retrieval skills. In the process, they develop networks of their own and increase their developing social capital (Davies, 2003; Phillips, 2002). The artefacts of connectivist learning are usually open, accessible and persistent. Thus, distance education pedagogy can be seen to move beyond individual consultations with faculty associated with cognitive-behaviourist pedagogy and beyond the group interactions associated with constructivist distance education pedagogy.

The cognitive presence of connectivism is enriched by interactions in networks, in which various groups such as alumni, practicing professionals and other teachers observe, comment upon and contribute to connectivist learning. Connectivist learning is based as much upon production of content as a consumption thereof. The results can be archives, learning objects, discussion transcripts and resources produced by students in the process of documenting and demonstrating their learning. These dialogic encounters become the content that students and teachers use and collaboratively create and recreate. Connectivist cognitive presence is enhanced by the focus on reflection and distribution of these reflections through, for example, blogs, Twitter posts and multimedia webcasts. Cognitive presence in connectivist pedagogy stresses the development of social presence through the creation and sustenance of networks of current and past students and of those with knowledge relevant to the learning goals. Unlike group learning, in which social presence is often created by expectation and marking for participation in activities within institutional timeframes, social presence in networks tends to be busy as topics rise and fall in interest. The activities of students are reflected in their contributions to Wikis, Twitter, threaded conferences, voice threads and other social network tools. Social presence is retained and promoted through the comments, contributions and insights of students who have previously engaged in the course and that persist as augmentable archives to enrich network interactions for current students. The activities, choices and artefacts left by previous users are paths to knowledge that new users can follow (Dron, 2006). In this way, the combination of traces of people's actions and activities generate a collective, which may be seen as a distinctive individual in itself (Dron & Anderson, 2009b).

As in constructivist learning, teaching presence is created by the building of learning paths and by design and support of interactions so that students make connections with existing and new knowledge resources. Unlike in the other two pedagogical approaches I have discussed in connectivist pedagogies, the teacher is not solely responsible for defining, generating or assigning content. Students and teacher collaborate to create the content of study, and in the process recreate content for future use by others. Assessment in connectivist pedagogy combines self-reflection with teacher assessment of the contributions to the current and future courses. These contributions may be reflections, critical comments, learning objects and resources, and other digital artefacts of knowledge creation, dissemination and problem solving. Teaching presence in connectivist learning environments also focuses on teaching by example. The teachers' construction of learning artefacts, critical contributions to class and external discussion, capacity to make connections across disciplines and context boundaries, and the sum of their presence all serve to model connectivist learning. A challenge to teaching is presented by rapidly changing technologies. No one is current on all learning and communications applications and teachers are sometimes less competent and have less self-efficacy than their students; thus, connectivist learning includes students teaching teachers and each other, in conjunction with teachers aiding the connectivist learning of all.

The main weakness of connectivist approaches is, paradoxically, a lack of connection (Chetty, 2013; Smidt et al., 2017). Cognitive-behaviourist approaches provide a strong structure to learning that makes explicit the path to be taken to knowledge. When done well, a cognitive-behaviourist approach helps the learner to take a guided path towards a specific goal. Constructivist approaches also place emphasis on scaffolding, albeit in a manner that is more conducive to meeting individual needs and contexts. They may have less structure than cognitive-behaviourist approaches, but constructivist models have many opportunities for dialogue. Social-constructivist approaches (especially the Vygotsky-influenced variety), rely heavily on negotiation and mediation to help the learner. In contrast to these, in connectivist pedagogies, structure is unevenly distributed and often emergent. When connectivist approaches are used in a formal course setting, where top-down structure is imposed rather than bottom-up, emergent connections of the network can be challenging. This context often relies heavily on setting focus areas that are typically provided by charismatic and popular network leaders. Such people occupy highly connected nodes in their

networks and can encourage a sufficiently large population to engage so that there is continued activity even when the majority do not engage regularly. Even then, students often want more controlled environment (Mackness et al., 2010). When implemented over a formal teaching pattern, connectivist approaches require a great deal of energy on the part of the central connector to actively maintain the network, and it is a common complaint that students start by feeling lost and confused (Dron & Anderson, 2009a; Hall, 2008). This is only partly due to difficulties in learning multiple technologies and navigating cyberspace, although this aspect can be an important issue (McLoughlin & Lee, 2008). The distributed nature and fuzziness of goals, beginnings, and endings often fit poorly alongside more formal and traditional courses that use a constructivist and/or a cognitive-behaviourist model. Furthermore, as Kop and Hill (2008) observe, students have not been given sufficient autonomy to exercise the control needed in such an environment.

Cognitive-behaviourist models are most notably theories of teaching and social-constructivist models are more notably theories of learning, but both still translate well into methods and processes for teaching. In contrast, connectivist models are mainly theories of knowledge production, which makes them difficult to translate into ways to learn and even more difficult to translate into ways to teach. The concept of "teacher" is almost foreign to the connectivist worldview, except as a role model and fellow node in a network. Another concern with connectivism is that while the crowd can be a source of wisdom (Surowiecki, 2005) it can equally be a source of stupidity (Carr, 2010) and groups can often go off in the wrong direction.

It is evident from the above discussion that implementing distance learning is more than logistics and technology. There is also the issue of a pedagogical approach. It is a mistake to think that f2f education can simply be translated directly into distance learning approaches. Heydenrych and Prinsloo's research (shared as Table 2.2) shows that some models of distance learning are more likely to draw on particular pedagogical approaches. As I have demonstrated here, the three main pedagogical approaches associated with distance learning – cognitive- behaviourist, social-constructivist and connectivist – each have their own enablements and constraints. I now turn to look at another issue raised by Heydenrych and Prinsloo (2010) in relation to distance learning, that of the curriculum.

2.9 The Structuring and Delivery of Open and Distance Learning Curriculum

Curriculum is "the process of engagement of students and staff with knowledge, behaviour and identity in different disciplinary contexts" (Lange, 2017, p. 32) encompassing the what, the who, the how, the where and the why of teaching and learning. It is thus a very broad concept that encompasses the structure of the syllabus, the pedagogical approach, the assessment and accreditation and so on. It is within this broad framing of curriculum that Maton (2014) indicates that we need to answer three key questions:

1. What knowledge is legitimated by the curriculum?
2. Which knowers are legitimated by the curriculum?
3. How are these knowledges and knowers legitimated in the curriculum?

Maton (2014) draws on the work of Bernstein to argue that a curriculum is never neutral. It comprises choices of selection (what to include or exclude, who to include and exclude), choices of sequencing (what is foundational and what is elective, which concepts are prerequisite to others and so on) and choices of pacing (how much time should be spent on what, in class and in assessment).

Bringing these concerns to distance learning often includes a focus on the extent to which distance learning allows for individualised approaches. Classes are heterogeneous groupings of students who differ in terms of abilities, interests, goals, finances and other means. This diversity in student population demands variation in the way they can be supported academically so that all students are able to learn, develop and excel. While this is true of any educational approach, in distance learning, this can be a particular challenge as curriculum developers and teachers generally have limited opportunities to come to know their students individually. On the other hand, distance learning is usually less tied to the time frames of f2f classes allowing students to work at their own pace. Put another way:

> Students and young adults are entitled to an education that has their best interests at heart, and develops their personality, talents and abilities to the full. Fair and equal education recognises differences in children and young people's experiences, interests and backgrounds and ensures equality in access and provision. BERA (2015)

Shay (2013) identified four ways that the curriculum can be varied (differentiated) to address the needs of gifted students: These include:

1) acceleration: adjusting the pace of learning;
2) enrichment: allowing for more depth and exploration within the content area;
3) sophistication: bringing more complexity and abstraction to the subject; and
4) novelty: providing for learning opportunities not generally included in the curriculum, often through self-directed, interest-based projects.

Similar strategies would be useful in ODL contexts. The intent of differentiating instruction is to maximise each student's growth and individual success by meeting each student where they are and assisting in their learning process. However, there is a critical dilemma which needs to be addressed as presented by Crozier (2013) who asks: when does treating people differently emphasise their differences and stigmatise or hinder them on that basis? And when does treating people the same become insensitive to their differences and stigmatise or hinder them on that basis? This is where it becomes critical to answer the question of what needs to be differentiated in the learning process. Is it the content, process, or products? (Tomlinson, 2017).

It is imperative that educators weave differentiated practices into their instructional strategies and consider this diversity of ODL classes (Hockett & Doubet, 2021; Vantieghem et al., 2020) in order to foster inclusivity. Sogo and Jeremiah (2018) argue that some teachers see differentiation as another burden heaped onto their already burgeoning workloads. However, Tomlinson (2014) finds that the following strategies indicate differentiated instruction:

1) offers personalised or individualised scaffolding;
2) uses flexible means to reach defined ends;
3) mines subject-area expertise; and
4) creates a caring classroom in which differences are seen as assets.

Allowing options that accommodate different learning needs helps students not only achieve learning goals but also to own those goals (Nava et al., 2022). Having a range of instructional approaches is attractive because it addresses the issue of epistemological access (Maina &

Maringe, 2020). For many students, it is only effective if the range of approaches takes the complexities of student diversity into account (Pozas et al., 2020). In such settings, equality of opportunity becomes a reality only when students receive instruction suited to their varied readiness levels, interests and learning preferences (De Neve & Devos, 2017). As transformation in society continues, effective teachers have to develop classroom routines that attend to student diversity in all its forms (Smets & Struyven, 2020).

The introduction of a curriculum that takes diversity seriously is however a complex and resource heavy process. The modification of teaching and learning routines to address a broad range of learners' readiness levels, interests and modes of learning is no simple task (Smets & Struyven, 2020; Tomlinson, 2014). Modifications are likely to be improvisational or reactive, rather than preplanned or proactive (Harris, 2014). Even being able to improvise in response to diverse needs is something that requires staff development, material resources and flexibility in curriculum structure. While many instructors acknowledge academic diversity in their classes and often affirm the need to address student diversity, their practice tends to be misaligned with those realities (Subotzky & Prinsloo, 2011). Most teachers teach the same material in the same way regardless of who is in the class (Bondie et al., 2019). However, students in differentiated classes with heterogeneous approaches achieve better outcomes than students in classes with a more "single-size fits all" approach to instruction (Hamdy, 2015).

Vygotsky (1978, 1986) proposed that an individual learns in their ZPD. The ZPD refers to the point of mastery beyond which the student cannot successfully function alone. At the outer limits of the student's current capacities, and not far beyond it, is the optimal learning space where scaffolding can enable the student to move forward. Scaffolding can take many forms of support by a more knowledgeable other, but it requires an understanding of diversity within the class and identification of where each student's point of mastery is. Questions and tasks that are interesting and manageable in terms of the ZPD are more likely to lead to enhanced student engagement with the task (Gheyssens et al., 2020). This is the case because the students would sense that the work involved is achievable albeit challenging, and therefore potentially rewarding, with greater evidence of student creativity, increased student productivity, a higher degree of student autonomy and a higher level of intrinsic motivation (Joseph et al., 2013).

Diversity of the student body includes prior educational experiences, levels of ability, personalities and more (Gentry et al., 2013). This can lead to different ZPDs and the need for different forms of scaffolding. Diversity in the student body and differentiation in the curriculum also needs to consider issues of social justice and inclusion and exclusion. For example, the male voice has unconsciously been more dominant in the education sector and more particularly in Science Technology, Engineering and Mathematics (STEM) teacher education in higher education contexts in developing countries. Being responsive to gender in STEM teacher education, for example, does not necessarily mean favouring female students but rather being sensitive to gender biases that have systematically disadvantaged female students in participating fully in the learning of STEM disciplines.

The gender gap is a direct response to stereotypes and socialisation practices in developing countries focused on male dominance and female submissiveness. Supporting the idea of socialisation and societally engrained stereotypes also focuses on the gender socialisation practices that occur in childhood such as boys are smart in mathematics and girls are good in the kitchen. These socialisation practices feed into the concept of stereotypic threat, which can undermine girls' performance in STEM fields (Reinking & Martin, 2018).

Female participation in STEM disciplines in teacher education programmes has persistently remained low in developing countries particularly in the Global South. For example, Masanja (2010) explains that in sub-Saharan African countries women continue to lag behind men in science, mathematics and technology education programmes. Furthermore, Lesego's (2015) research in Science and Mathematics teacher education programmes in Botswana revealed that the rigid patriarchal systems of social groups contributed to gender disparities in these programmes. Chikunda (2010) recommended mainstreaming gender issues in the school curriculum in Zimbabwe to reduce those effects. Chikunda (2014) found that patriarchal social conditioning plays a very important role in teacher educators' identities, and this influences their curriculum practices, constraining implementation of gender-responsive curriculum practices in Science and Mathematics subjects. Gender is thus one of the many forms of diversity that if not carefully considered can result in the social injustice of exclusion and lack of representation in curriculum deliberations.

In this chapter thus far, I have provided an overview of some of the debates in the literature related to distance learning. In particular, I presented models of distance learning, pedagogical approaches and a few issues related to curriculum. This thesis however hones in on a particular aspect of ODL, which is field facilitation, and so this is where I now turn.

2.10 Field Facilitation in Open and Distance Learning

Field facilitation, briefly introduced in Chapter One, refers to additional support or scaffolding provided to ODL students off-campus. In much of the literature, field facilitation is synonymous with tutoring (McCaughan, 2013; Mosely et al., 2018). Tutoring is an additional academic support strategy aimed at enhancing student learning. Tutoring, though not specific to the ODL context, has been instrumental in supporting learning in both f2f and ODL contexts. In this study, the term 'field facilitation' has been used for two main reasons. The first reason is that Mzuni adopted field facilitation as the term to refer to additional student-centred academic support strategies for students studying Science and Mathematics in the B.Ed Science programme using the ODL mode of delivery (see Section 1.4.4.1). The second reason is that the learning support is not campus based. It is provided remotely in the Satellite Learning Centres of Mzuni hence the term 'field'.

The word 'facilitation' literally means helping someone achieve something which would be a challenge to achieve without that help. In an educational context, a facilitator is someone who helps a student learn or study. Though the word 'facilitator' is often used synonymously with the word tutor, there is a slight difference. A tutor plays a limited number of roles in the learner's learning process while a facilitator is accorded more authority and roles (Le Ha, 2014). The addition of the adjective field on the other hand denotes a reduction of powers or authority of a facilitator.

Students are capable of designing and implementing collaborative action and improving their learning experiences provided they have access to advice from a supportive other (Heather, 2006). In other words, students need to be empowered as directors of their own learning with scaffolded support in their ZPDs. The question then is how we empower them. For the student empowerment to happen, educators need to move from being transmitters to being facilitators of learning. This requires a student-centred understanding that shifts educators from providing information to

providing structure, support and connections to the resources (Ejiwale, 2012). This has power dynamic implications. Teachers must become comfortable with students being teachers as well, working in cooperative groups to solve problems in a culturally, technologically and socially evolving environment. Drawing on this more sociocultural understanding entails an awareness that just assembling field facilitators and Science and Mathematics students in one room is no guarantee that student learning will take.

There are many types of field facilitation models which reflect economic and infrastructural developments of a region or country. Malawi, being a developing country has its own challenges, which are reflected in the educational practice in general and in ODL practices in particular. One challenge is the large student lecturer ratio (Chibambo & Jere, 2018) which can lead to a compromise on quality distance education delivery (Tembo & Mwale, 2019).

In the pages that follow, I present a brief overview of six cases of field facilitation in an ODL setting, starting with international higher education examples before presenting additional Malawian examples from further education colleges.

2.10.1 Open University United Kingdom field facilitation model

The OU UK is considered as one of the mega open universities in the world. According to the 2019/2020 statistics of the OU UK, the university has a student population of approximately 208 308 students and spread over 169 regions of the UK and the world. Given the relatively well-resourced context of the OU UK and its significance in the UK higher education system, it is perhaps unsurprising that it enjoys a well-structured and resourced model of field facilitation.

The Open University (OU) UK field facilitation model explicitly recognises the humanity of the individual learner (Tait, 2014). This includes the identification of the affective dimensions of the learning experience, along with the cognitive and systemic dimensions (Tait, 2000). Taking this explicit consideration of diversity has led to a well-structured field facilitation model. At the OU UK, each student has a personal field facilitator. Each field facilitator is allocated around 20 to 25 students. The field facilitator's role was developed particularly powerfully from 1971 onwards, within the OU UK and elsewhere, as being central to the student support system, in order to provide individualised support to students. The role of the field facilitator at the OU UK includes:

- Providing individual support through teaching and grading of assignments, the core vehicles for learning;
- Having a key role therefore within the assessment scheme in the ultimate recognition of learning through credit and qualification;
- Paying particular attention to the progress and success of individual students, both through response and intervention;
- Providing opportunities for social learning where possible in groups, and a dimension of the local and familiar through a f2f contribution to learning;
- Providing support with regard to administrative and other systemic issues (Tait, 2014).

2.10.2 The University of South Africa field facilitation model

The UNISA is an ODL institution in South Africa. It is the largest university in the country with approximately 400 000 students and seven centres (six local centres and one international centre). It uses some blended approaches but is still largely correspondence. At UNISA, the field facilitation model is composed of two pathways. It has a combination of an online field facilitation support model and an offline field facilitation support model (Prinsloo, 2010). These field facilitators do play the dual functions of supporting student learning and marking (Prinsloo, 2010).

Among the 400 000 students currently enrolled, there will be a range of needs for tutorial support from none to extensive (and not necessarily recognised on the part of the student) – therefore, decisions about field facilitation support need to be informed by feedback from students themselves – possibly through a survey (Prinsloo, 2010). At UNISA, the authority to appoint field facilitators is delegated to colleges or departments who manage and report on the use of the field facilitation funds. Academics or students may identify modules requiring field facilitation support. After consultation with regional centres, they come up with a list of field facilitation needs in different centres for different modules based upon current and past requests and can proactively advertise for new field facilitators. When academics wish to have field facilitators appointed, they can stipulate the requirements. The offers of appointment are then sent back to the relevant regional centres who contact the prospective field facilitators to come and sign their contracts (Heydenrych & Prinsloo, 2010).

The decentralisation of tutor recruitment, appointment, training and monitoring to colleges or departments allows for greater flexibility in responding to the needs of different modules and programmes (Gilbert, 2017). It was also an attempt to link decision-making accountability to the level to which finance has been provided and payments will be approved. Anderson (2010) notes about UNISA's decentralised model of field facilitation that it moves learner support from the periphery to being central to a department's activities. It also makes clear that scaffolded support does not have to involve physical contact.

The nature of field facilitation model adopted or adapted depends on the context in which the field facilitation is taking place. The OU UK and UNISA Field Facilitation models are field facilitation models in well resourced contexts. The context of this study is the resource constrained context. It is therefore paramount that models of equally resource constrained contexts are considered hence the discussion of some developing contexts in the global south such as Zambia and Uganda.

2.10.3 Zambia Open University field facilitation model

Zambia is a neighbouring country of Malawi on its Western border and it shares relatively similar history and this model is therefore worth considering. Zambia Open University has a more holistic approach to field facilitation though it is unclear to what extent disciplinary scaffolding is a core focus. Academic support at Zambia Open University has a component of academic counselling which comprises general counselling and tutoring to provide linkage between the institution and the student (Mpolomoka, 2022). General counselling activities involve using academic counsellors who were initially trained to handle full-time f2f students. Both general counselling and tutoring take place at the university's regional centres which are spread across the country. Tutoring is done both f2f and online.

2.10.4 Makerere Open University field facilitation model in Uganda

While Uganda does not border Malawi, being further north of Tanzania, it is worth looking at the case of Makerere University given its prestigious history and key similarities regarding resources available for ODL teaching and support. Makerere University operates in a dual institution where a combination of f2f programmes are offered alongside ODL (Aguti, 2006; Muyinda et al., 2009). The ODL programme support is provided both on campus and off campus. Off-campus (distance)

support has a field facilitation component. This is decentralised and takes place in study centres which are distributed in all strategic regions across the country. These remote study centres work as an extension of the main campus to the remote community (Mutambo et al., 2018).

Muyinda (2012) noted a number of shortcomings in the Makerere Field Facilitation Model, many of which are no doubt evident in other ODL institutions in developing countries. For example, Muyinda (2012) found that increased centralisation of student support systems and externalisation of ODL programmes are key concerns for successful implementation of ODL programmes.

The findings from the research by Mutambo (2018) were that the centres are relevant to offering remote learner support, especially given the low level of technological advancement in Uganda. However, due to a number of factors such as those indicated above, the centres are not offering satisfactory support to the students. Challenges also include the indistinct status and mandate of ODL; gaps in the University's policies and understanding of ODL; inadequate funding of the centres; communication gaps between the centres and their coordinating unit at the university's main campus; inadequacy of study, ICT and human resources at the centres; and unconducive location and opening hours of the centres (Mutambo, 2018; Muyinda, 2012). Many of these issues raised about Makerere have resonance across ODL in less developed regions. Indeed, as will be discussed later, some of these issues emerged in my data.

Mzuzu University is not the only institution in Malawi to offer ODL, and so I end this brief overview of a few examples of field facilitation in ODL by looking at two sister institutions namely the MCDE and Domasi College of Education.

2.10.5 Malawian field facilitation models

2.10.5.1 Malawi College of Distance Education field facilitation model

As described in Chapter One, the MCDE initially called Malawi Correspondence College, was established in 1965 to regulate provision of distance education at secondary school level. The MCDE Field Facilitation Model uses teacher supervisors as field facilitators in supporting student learning. Teacher supervisors are teachers who supervise and guide teaching and learning in Open Secondary Schools on a part-time basis. Their roles are to support students through supervising, assessing learner performance, providing counselling and guidance, and administering tutor

marked assignments in the Open Secondary School (Handbook for Open Secondary Schools and Study Centres, 2008). Distance learners are highly supported in their studies through face-to-face sessions. This is done in Open Secondary Schools and study centres.

The field facilitation is thus well-structured and resourced and offers learners multiple scaffolding opportunities. However, the MCDE only operates at secondary school level and does not offer or contribute directly to the offering of higher education qualifications.

2.10.5.2 Domasi College of Education field facilitation model

As discussed in Chapter One, Domasi College of Education was the pioneer in offering teacher training at higher education level through ODL (Banda, 2012; Chakwera & Saiti, 2005; Moyo, 2015). The Domasi College of Education, a college under the Ministry of Education, introduced ODL programmes in the year 2000 (Moyo, 2015). Field facilitation support at Domasi College of Education involves the use of study circles, seminars and monthly meetings, and professional portfolios, to ensure successful learning during the distance phase of the semester.

A study circle is known by several names such as a cluster meeting or study group (Beckmann & Aluko, 2011). A study circle is a small group of learners studying similar subjects/courses who work together on a particular learning challenge (Banda, 2012; Centre for Distance and Continuing Education, 2000). As part of the student support system, cluster meetings and study circles are meant to enhance student-to-student support and instil a sense of belonging to a cohort (Chakwera, 2011). Segoe (2014) asserts that learning support goes beyond material support and access and needs human support in the form of peer support and the study circles are directed to this end. Study circles contribute significantly to student learning and success in non-traditional ODL programmes (Chakwera, 2011). Study circles are either informally organised or are sometimes timetabled to meet on specific days, for example, once a week on Friday. Study circles play a critical role in student learning at Domasi College of Education by encouraging active learning through group problem solving and discussions (Banda, 2012).

Field facilitators organise field seminars, study circles and monthly meetings with students. The Centre for Distance and Continuing Education (CDCE) at Domasi College of Education arranges visits to study circle meetings to ensure that field supervisors are working as expected and that

learners are progressing appropriately during home study periods. Domasi College of Education lecturers are sometimes involved through CDCE office as tutors upon request from the field (Msiska, et.al, 2013).

2.11 Conclusion

This chapter considered a few of the debates in the literature on ODL. While technological advances have enabled enormous shifts in ODL, the context in which this study was undertaken is constrained by limited resources. The overview of approaches to ODL thus needs to be considered within an understanding of the context. Drawing on the work of Heydenrych and Prinsloo (2010), I argued that the pedagogical approach to ODL is conditioned by the model of ODL available. I outlined the three main pedagogical approaches – cognitive-behaviourist, social-constructivist and connectivist and the affordances and shortcomings of each, before looking at issues of curriculum structure and student diversity.

While this chapter raised many of the debates about ODL to be found in the literature, the study was specifically about one aspect of it, field facilitation. I therefore ended the chapter by looking at forms of field facilitation used in different contexts. In the next chapter, I move on to the theoretical framework underpinning this thesis – CHAT.

CHAPTER THREE: THEORETICAL FRAMEWORK

3.1 Introduction

All research is undertaken with a set of assumptions about the world and a set of lenses to interrogate the phenomenon under study. While positivist research promises objective truths, many philosophers have argued that this is an impossible goal and that our assumptions and lenses are always at play regardless of our attempts to set them aside. In social science research, such as this study, it has thus become common to have a chapter such as this one that sets out the theoretical lenses that are being used to 'see' and make sense of the data and thereby to reach a set of findings that might be useful to others. In clearly specifying the theoretical framing of the study, this chapter also outlines the rationale for the use of this theory and explains how it was applied in the study.

Cultural-Historical Activity Theory (CHAT) is the main theoretical framework that underpinned this study. Specifically, the study draws on several conceptions such as Vygotsky's ZPD and other work and Engeström's second-generation Activity Theory. However, the first, third and fourth generations of Activity Theory will also be discussed alongside an explanation for the choice of CHAT and in particular the second-generation version thereof. This chapter begins with a discussion of the ZPD, a key underpinning concept of CHAT.

3.2 The Zone of Proximal Development

The concept of the ZPD was developed by Lev Vygotsky during the late 1920s and elaborated progressively until his death in 1934. In *Mind in Society: The Development of Higher Psychological Processes*, Vygotsky defined the ZPD as "the distance between the actual development level as determined by independent problem solving, and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peer(s)" (1978, p. 86).

The ZPD is thus the current or actual level of development of the student and the next level attainable through use of mediating semiotic and environmental tools with the help of the capable facilitator. The idea here is that individuals learn best when working together with others during

collaboration, and it is through such collaborative endeavours with more knowledgeable or skilled persons that students learn and internalise new concepts, psychological tools and skills.

In this study context, the ZPD is depicted as an area where humans come together to share learning experiences. And as a meeting point, such a convergence would lead to both growth and development and would also yield conflicts and contradictions within the learning process. This is the reason the ZPD anchors CHAT. Essentially, while CHAT rudimentarily provides room for explicating and understanding the contradictions and tensions within the entire activity system of the field facilitation process, as will be discussed, the ZPD aids in explicating what exactly happens in the process by way of benefits and challenges during the learning process (Foot, 2014).

The ZPD allows an elaborate account of the mediational means between the transmitter and the acquirer, who in this study are the more knowledgeable others (field facilitators) and the less knowledgeable (students). Given this assumption, it follows then that where two sets of people with different levels of power and knowledge meet, issues of power relations may become inevitable. Such power differences may breed injustices which can impact the learning processes and outcomes.

The underlying assumption of the ZPD is that students do not learn in isolation but rather through continued interactions and dialogue within social, cultural and political environments (Freire, 2005; Vygotsky, 1978). It is the responsibility of the one facilitating the learning to establish an interactive instructional situation where the student is an agent actively participating in the learning process and leading the process, while the facilitator uses their knowledge to guide learning and mediate the learning process but does not dominate it. Newman et al. (1989) argue that the ZPD is created through negotiation between the more advanced partner and the less advanced partner (student), rather than through the simple transmission of knowledge and skills. Moll (1990) and Freire (2005) further suggest that the focus of change within the ZPD should be on the creation, development and communication of meaning through the collaborative use of mediational tools rather than as the transfer of knowledge and skills from the more to the less capable partner, or what Freire (2005) calls the “banking approach”.

The "cultural" interpretation of the ZPD is based on Vygotsky's distinction between scientific and everyday concepts. Hedegaard (1998) argues for the "double move approach" in the process of concept formation within the ZPD. He suggests that "the teacher guides the learning activity both from the perspective of general concepts and from the perspective of engaging students in 'situated' problems that are meaningful in relation to their developmental stage and life situations" (Hedegaard, 1998, p. 120). In the "collectivist" or "societal" perspective, Engeström (1987, p. 174) defines ZPD as the "distance between the everyday actions of individuals and the historically new form of the societal activity that can be collectively generated".

The hidden curriculum that goes on in the learning environments within teacher-centred approaches, instructions and commands can create learners who are passive and objectified. Freire (2005) proposes a collaborative and mutually respectful learning environment in which learning is characterised by interaction, dialogue and love. In this relationship, both teachers and learners are co-creators of knowledge and partners in the learning process so that critical thinking, problem solving, and self-awareness are enhanced. Essentially, Engeström, Vygotsky and Freire are all advocating along the same lines for meaningful and successful learning processes. Nussbaum (2012) suggests that such approaches should present society with a fully developed citizen not only conceptually but also in other areas of life including civic participation, critical theorisation, problem solving and narrative imagination.

The concept of the ZPD has been widely used to research and advocate transformation and agency in social projects in Southern Africa and elsewhere (Chisoni, 2016; Kachilonda, 2014; Lindley, 2014; Masara, 2010; Mukute, 2010). This study, like many other educational studies that use the concept of the ZPD, uses the ZPD within the larger framing of CHAT.

3.3 What is Cultural-Historical Activity Theory?

The Cultural-Historical Activity Theory, abbreviated as CHAT, contains hierarchical structure of the activity, object orientedness, internalisation and/or externalisation, tool mediation and development as its basic principles (Kaptelinin & Nardi, 1997). It is a *theory* of human *activity* that understands such activity as being *culturally* and *historically* situated. The CHAT studies activity systems, that is, it provides insights into human activities and the relationship between

what we think, value and do. Zavershneva (2014) and Rodríguez (2021) argue that Vygotsky indicated that our consciousness is neither linear nor objective but rather is shaped by our social and cultural interactions. They argue that people act collectively and as they communicate about and through such actions, they learn from them (Rodríguez, 2021; Zavershneva, 2014). In the process, people make tools and artefacts that enable them to act (Castro, 2016). Communication is therefore an integral part of meaning making.

The CHAT surfaces contradictions, tensions and conflicts that ensue when elements or nodes within a single activity system or elements of different activity systems come into play or converge. The CHAT is one of several practice-based approaches that provide a robust framework for analysing professional work practices, including social service provision (Julkunen, 2011, 2013). By offering a multi-dimensional, systemic approach that includes both psychological motives and all kinds of tools as well as considering the dynamics of power, money, culture and history, CHAT allows researchers to analyse complex and evolving professional practices to engage in reflective research. Mukute and Lotz-Sisitka (2012) add that CHAT is an epistemological theory that assumes that learning takes place through collective activities that are purposefully conducted around a common object, based on the proposition that learning is a social and cultural process that draws on historical achievements.

As discussed in Chapter One, this study focused on field facilitation activity as a professional practice to look at issues of distance education in less technologically advanced contexts more generally. Field facilitation, in this study, is understood as a learning support strategy for Science and Mathematics student teachers aimed at enhanced learning and success among ODL students in the B.Ed Science programme. Using CHAT as the theoretical lens, field facilitation can be understood as an institutional activity comprising elements typical of any other activity system. Understanding these elements and how they relate would be critical to the improvement of the field facilitation practice. In Foot's words (2001, p. 57):

> Activity theory is deeply contextual and oriented at understanding historically specific local practices, their objects, mediating artefacts, and social organisation. … Activity theory is based on a dialectical theory of knowledge and thinking, focused on the creative potential in human

> cognition. … Activity theory is a developmental theory that seeks to explain and influence qualitative changes in human practices over time.

The CHAT thus aligns with both the study topic and its intent. In order to understand why and how it was applied in this study, it is worth considering the history of the theory. Any history of CHAT would be incomplete without a consideration of the work of Vygotsky (1896–1934) a psychologist. Psychology is concerned with reconstructing the origin (causes) and course of development of behaviour and consciousness. Not only does every phenomenon have its history, but this history is characterised by "qualitative changes" both in form and structure (Seaman & Gingo, 2011, p. 179). A central tenet of this method is that all phenomena be studied as processes in motion and change.

Vygotsky clearly viewed Marxist thought as a valuable scientific resource from very early in his career. Vygotsky saw in the methods and principles of "dialectical materialism" a solution to key scientific paradoxes facing his contemporaries (Vygotsky & Cole, 1978), and he valued the relevance of history and dialectics in understanding human learning and mind formation (Blunden, 2009). Dialectical materialism is a philosophy of discovering the truth of ideas through discussion and logical argument and of considering ideas opposed to each other (Moore, 1971). Abercrombie and Turner (2006, p. 107) explain dialectics as depending on the view that activity "depends on the clash of perspectives (contradictions) and the creation of a new, more advanced synthesis out of the clashes".

Besides dialectical materialism, historical materialism (or theory of society) also developed by Marx, played a fundamental role in Vygotsky's thinking (Cole et al., 1978). Cole et al. (1978, p. 7) indicate that for Marx, historical materialism entails "historical changes in society and material life which produce changes in human nature (consciousness and behaviour)". Vygotsky was the first to attempt to relate historical materialism to "concrete psychological questions by creatively elaborating on human behaviour and tool use as the means by which man changes nature, and in so doing, transforms himself" (Cole et al., 1978, p. 7). Here, like in dialectical materialism, history is emphasised along with "tool use" for socio-ecological transformations to take place.

To summarise, drawing strongly on the work of Marx, Vygotsky was the first person to bring concepts of dialectical dualism and historical materialism together systematically and psychologically for understanding mental processes (Vygotsky, 1978). He was later joined by Aleksei, Leontiev and Luria to constitute what Blunden (2009) called 'the founding *troika*' of the cultural-historical approach to social psychology. This *troika* was later joined by five young scientists, namely, Zaporozhets, Bozhovic, Slaving, Morozova and Levina forming what Sawchuck et al. (2006) called the *vosmyorka.*

The *troika* and then the *vosmyorka* worked very closely: everyone participated in the elaboration of new ideas. So, for example, in the twenties, Luria made important empirical and theoretical contributions to the new cultural-historical development theory and his research had important significance for the further cultural-historical analysis of such problems as memory, speech and consciousness. Likewise, Leontiev made further important improvements especially with his investigation of the development of memory published in 1934. Regarding the idea of Vygotsky that the human psyche can be revealed only through the analysis of activity, Leontiev placed this idea at the centre of his own scientific work and began to elaborate the problem of activity systematically.

The improvements in CHAT have seen the framework progress through four successive generations as follows: the first generation focuses on mediated action, the second generation focuses on the individual in collective activity, the third generation focuses on multiple interacting activity systems, and the fourth generation focuses on complex runaway objects (Engeström & Sannino, 2021).

3.4 The Four Generations of the Cultural-Historical Activity Theory

This section outlines the four generations of theorising and research on work and learning. Over the four generations of CHAT evolution, the units of analysis have shifted from mediated action to a collective activity system, to multiple interconnected activity systems, and most recently to heterogenous work coalitions aimed at resolving wicked societal problems (Engeström & Sannino, 2021; Sannino, 2017, 2020; Sannino & Engeström, 2018). Although the units of analysis have evolved over the generations of CHAT, the fundamental suppositions remain the same. However,

my study is essentially a second-generation Activity Theory study as its focus was on one collective activity system (and the mediated activity within it). But some aspects of subsequent generations proved useful too and were drawn in as necessary, hence my discussion of the four generations of CHAT.

3.4.1 The first-generation Activity Theory

First-generation Activity Theory mainly draws on Vygotsky's concept of mediation which traces back to Marx's (1976 [1883]) trans-historical concept of labour or activity. In this, Marx (1976) explains that labour processes are (i) purposeful activity, that is work itself, (ii) the object on which that work is performed, and (iii) the instruments of that work. This was a reaction to behaviourism's explanation of consciousness or the development of the human mind, which was seen to reduce the mind to a series of atomic components associated with the brain as "stimulus-response" (S-R) processes. Vygotsky (1978) argued that the relationship between a human subject and an object is never direct, making the S-R notion reductionist. Rather, he said that the relationship between human and object must be sought within the context of society and culture because these relationships evolve historically not in the human brain or mind but in social activities. Vygotsky thus saw consciousness as emerging from human activity mediated by artefacts (tools) and signs. The first-generation Activity Theory is illustrated in Figure 3.1 below.

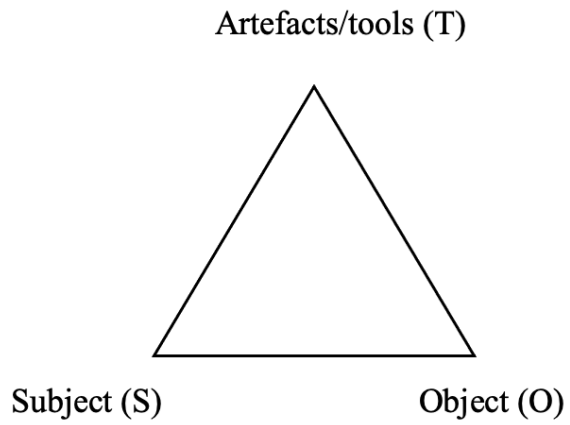


Figure 3.1: The first generation of Activity Theory showing mediated action (Vygotsky's original formulation)

(Vygotsky, 1978, p. 86)

In the original Activity Theory, Vygotsky concentrated on the symbolic mediation of culture, analysing the relationship between human action (the individual) and cultural artefacts (tools) embodied in his famous but simplified triangular model which features the Subject (S), Object (O), and Mediating Artefact/tools triad (T) (Engeström, 2001). In mediated action, the Subject, Object, and Artefact/tools stand in a dialectical relationship whereby each one of them affects the other, and affects the activity as a whole.

Stetsenko (2020, 2005), Yamagata-Lynch (2007) and Hasan (2007), following Vygotsky (1978), argue that the use of artefacts broke away from mere biological accounts of development allowing the creation of new forms of culturally-based psychological processes – hence the importance of the cultural-historical context. In the Vygotskyan framework, the unit of analysis, however, remains principally the individual, though the agency of such individuals can no longer be understood without their cultural environment and society (Vygotsky, 1978). To this end, the first-generation Activity Theory has been used to understand individual behaviour by examining the ways a person's objectivised actions are culturally mediated. Vygotsky's argument is that people

learn from their culture, society and history as individuals by applying conceptual and material artefacts to transform the object (Edwards, 2005, 2007).

3.4.2 The second-generation Activity Theory

Leontiev (1903–1973), a student of Vygotsky and one of the original parts of the original *troika*, developed the work of Vygotsky into what is commonly known as the second-generation Activity Theory (see Figure 3.2 below).

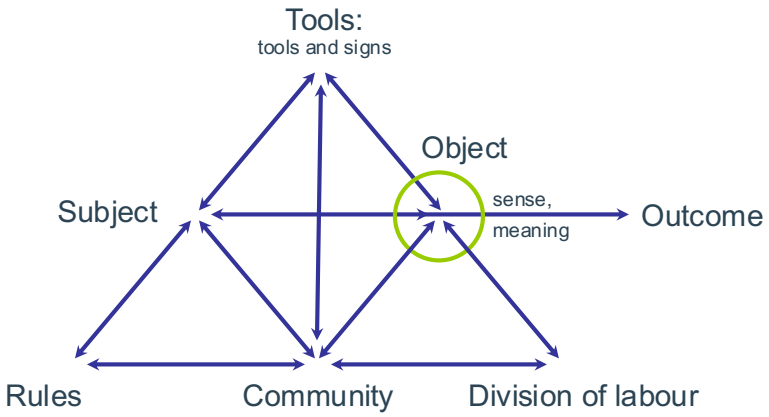


Figure 3.2: Second-generation activity system

(Engeström, 1987)

The first-generation Activity Theory was considered limited in its explanatory value given the complex nature of society and its changing needs (Engeström, 1987). Leontiev focused on collective responsibility towards an object, giving room for understanding how collective action by social groups mediates activity. He thus included *community*, *rules*, *division of labour* and the importance of analysing their interactions. In his famous example of a "primeval collective hunt", Leontiev (1981, p. 213) describes the crucial difference between an individual action and a collective activity where in a hunt, one group of individuals chases the game away while the other group waits to ambush the game and kill it (see also Engeström, 1999).

It should be noted that in Vygotsky's understanding, human learning was more symbolic than for Leontiev who focused on human development through everyday life experiences or the lived world. Leontiev (1981), however, recognised that development is not an individual activity but rather collective. Thinking about collectiveness brings an idea of community actions where an activity only exists in relation to rules, community and division of labour (Engeström, 1999).

The collective *activity system* in this sense includes social, psychological, cultural and institutional perspectives in the analysis. In this context, activity systems are inherently related to what Engeström (1999) describes as the deep-seated material practices and socioeconomic structures of a given culture. These societal dimensions were not adequately accounted for by Vygotsky's earlier, simpler triadic model. Conversely, in Leontiev's understanding, thought and cognition are understood as part of social life (the lived world) and as part of the means of production and systems of social relations on one hand and the intentions of individuals in certain social conditions on the other. For example, the example of a '*primeval collective hunt*' as earlier mentioned, clarifies the crucial difference between an individual's *action* ('the beater frightening game') and a collective *activity* ('the hunt'). And, while, individuals' actions (frightening game) are different from the overall goal of the activity (hunting), they all share the same motive (obtaining food). Their operations are driven by the conditions and tools at hand; for example, the objective circumstances under which the hunting is taking place.

All the components of the system, including the top triangle and the bottom sociohistorical components, mediate change not only for the object but also for the subject. In developing his ideas, Leontiev (1981) suggests that (a) the relationship between an individual and the object of their activity is mediated by concepts and technologies, (b) the relationship between the community and the overall object of its activity is mediated by its division of labour, and (c) the relationships between individuals and the communities, of which they are part, are mediated by the rules and procedures which can be explicit or implicit (for example, cultural rules that govern Science and Mathematics' pedagogical practices) (Hardman, 2008) (see Figure 3.2).

Daniels (2001) notes that the importance of the second-generation Activity Theory is that it brings interrelations between the individuals and their communities into focus. Daniels (2001) views artefacts as integral components of student learning. He argues that the focus on mediation should

be on its relationship with the other components of an activity system. Vygotsky's, Leontiev's and Engeström's understandings of Activity Theory attempt to provide an account of human learning as mediated processes. In Activity Theory, it is the activity itself which is the nerve-centre of analysis. The activity takes place in a context that is influenced by social, cultural, historical, political and institutional factors. Blackler et al. (2000, p. 281) argue that the "activity system comprises an interrelated bricolage of material, mental, social and cultural resources for thought and action". Basharina (2007, p. 84) indicates that understanding learning as an activity system provides powerful lenses in that learning entails "the joint activity of a learner, physical/symbolic tool(s), and another person(s) performing together as a working social system to achieve some outcome under cultural constraints such as rules".

In the case of this study, this entailed a consideration of how the field facilitation activity system is continually interacting with the existing university structures and within these interactions there are issues of culture, language differences, resources, politics and power relations – all of which work for or against the success of the activity system. Thus, the activity of field facilitation in Science and Mathematics teacher education among ODL students does not exist and operate in a vacuum but rather in a space that is conditioned by social, cultural, historical and political powers and influences.

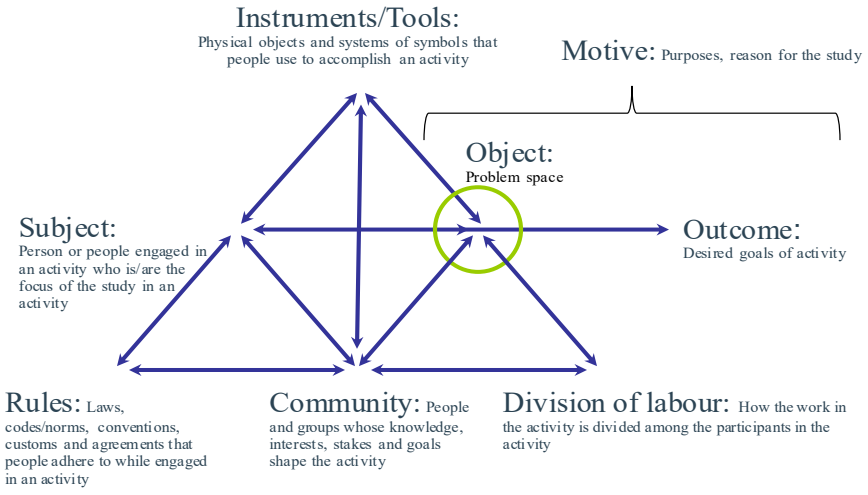


Figure 3.3: General functioning of CHAT

(Engeström, 1987)

3.4.2.1 Elements of the second-generation Activity Theory

As shown in Figure 3.3 above, the second-generation Activity Theory comprises a group of individuals pursuing a common goal in a purposeful way (Peal & Wilson, 2001). Summarised below are the elements of the typical second-generation activity system and their relationship to one another and the activity system as a whole. As a reminder, Vygotsky's mediated action model has the Subject (S), Object (O), and Mediating Artefact triad (T) (Engeström, 2001). The second-generation model which is the improved version has additional elements to that of the Vygotsky's model as discussed below.

Rules: These are both explicit and implicit regulations, norms and conventions that allow actions and interactions within an activity system. One set of questions that needs to be considered is: Who makes these rules? Under what circumstances? And whose interests do these rules serve within the activity system?

Community: This is a group of people who share the same object(ive). The community would include the Subject(s) of the activity system as well as role players who interact with the Subject(s) to achieve the shared object(ive).

Division of labour: Division of labour refers to both the horizontal actions and interactions among the members of the community and to the vertical division of power, resources and status related to the transformation process of the object into the outcome of labour (Engeström, 2001).

3.4.3 The third-generation of Activity Theory

After Vygotsky's foundational work on the individual's higher psychological functions (Vygotsky, 1978) and Leontiev's extension of these insights to collective activity systems, questions of diversity and dialogue between different traditions or perspectives became increasingly serious (Engeström et al., 1999). It was argued that the second generation of Activity Theory focused on one activity at a time and was insensitive to some of the complexities of cultural diversity across multiple activity systems (Cole, 1988). The third-generation Activity Theory, developed largely by Engeström working with Cole and others, goes beyond a single activity system to multiple activity systems. Bringing two or more activity systems into contact with one another to work on a partially shared object means that we have to now consider the potentially different cultures,

meanings and histories that these different subjects and communities will have. Figure 3.4 below illustrates the model of the basic third-generation activity system.

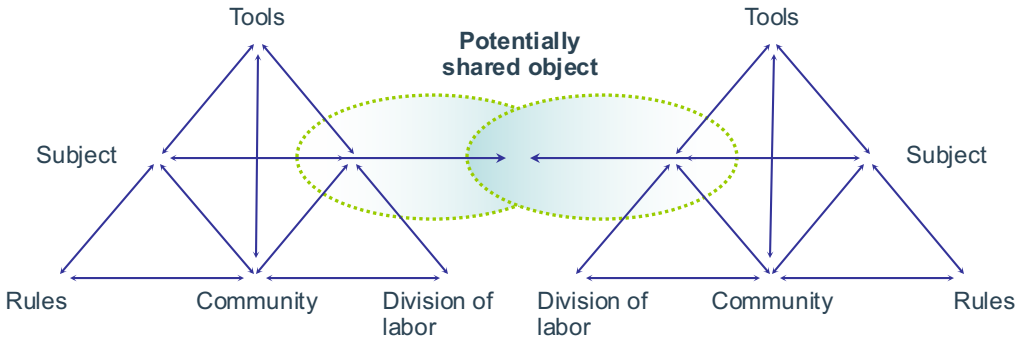


Figure 3.4: The basic model of third-generation Activity Theory

(Engeström, 2001)

3.4.4 The fourth generation of Activity Theory

The fourth generation was developed to address the shortfalls of the third-generation Activity Theory. The third-generation Activity Theory is limited as it does not adequately address peer and social production, social production and other non-institutional, voluntary, durable collaborations which have recently been influential in society (Engeström & Sannino, 2021). While the third-generation Activity Theory literature focuses on bounded organisations, the fourth-generation Activity Theory literature focuses on intervening in runaway objects that no single stakeholder can completely comprehend. The fourth-generation Activity Theory seems better placed to understand peer and social production in which individuals collaborate across or outside organisations and in which "the boundaries and structures of activity systems seem to fade away" (Spinuzzi & Guile, 2019, p.4). Alternatively, Engeström and Sannino (2021) propose developing the fourth-generation Activity Theory to provide alternatives to capitalism where capitalism is understood as the neoliberal global regime. Figure 3.5 below is an illustration of the fourth-generation Activity Theory.

Figure 3.5: An example of Fourth-generation Activity Theory in action

(Engeström & Sannino, 2021)

The four generations of Activity Theory see that work needs to be analysed as object-oriented practice, mediated by instruments, and changing through its inherent contradictions. Work is to be understood in its constant development and transformations, making learning a central aspect of work. Transformative agency and wilful action are of crucial importance in performing and shaping work. Presented below is Table 3.1 summarising the four generations of Activity Theory with specific focus on their units of analysis.

Table 3.1: The four generations of Activity Theory

	First generation	Second generation	Third generation	Fourth generation
Object and problem	Challenge in individual learning/development	Collective developmental contradictions demanding an expansive solution	Developmental contradictions within and between interconnected activity systems	A critical societal challenge or crisis demanding a multi-level and cross-sectoral solution
Unit of analysis	Mediated action	Collective activity system	Minimally two interacting activity systems with a partially shared object	Coalescing cycles of expansive learning in a heterogenous coalition of activities facing a critical societal challenge
Concept of learning	Internalisation of given skills and knowledge	Expansive learning cycle generating what is not yet there	Expansive learning cycle involving boundary crossing and horizontal sideways learning	Horizontal and vertical interplay between multiple coalescing cycles of expansive learning
Concept of agency	Agency as grasping the historically evolving nature and emancipatory possibilities of one's actions	Agency as expansive movement from individual subjects and their tasks towards collective subjects transforming their activity	Agency as recognition and negotiation of differences and complementarities	Transformative agency by double stimulation
Typical intervention	Training aimed at emancipatory understanding and mastery of one's actions	Longitudinal process of collective analysis and redesign of the activity – emergence of the Change Laboratory method	Change Laboratory and boundary crossing laboratory	Multiple interconnected Change Laboratories, from local to municipal, regional, national and international levels – with longitudinal follow-ups

Source: Engeström and Sannino (2021)

Of critical importance in the table are the units of analysis of the four generations of Activity Theory. The units of analysis from the first generation to the fourth-generation Activity Theory (mediated action, collective activity system, minimally two interacting activity systems with a partially shared object and coalescing cycles of expansive learning in a heterogenous coalition of activities).

3.5 A Closer Look at Second-generation Activity Theory

While there are clear merits to using the more nuanced third-generation model, my study focused on one activity system within one clearly specified context. I therefore decided to use second-generation Activity Theory to make sense of the activity system of field facilitation.

Drawing on sections 3.4.1 and 3.4.2, I will begin by setting out the activity system in this study. The *subject (S)* of this study's activity system was the field facilitators at Mzuni who were employed by the ODL Centre. The *object (O)* of the activity was to enhance student learning and success. The *artefacts/tools (T)* in this study were the instructional modules in the B.Ed Science programme. The *rules* that guided this activity system include all institutional rules and requirements which affect student learning. This includes policies drafted by Mzuni that guide the work of the ODL Centre as well as the work of the lecturers and the field facilitators. The *community* in this study included the lecturers in the B.Ed programme, the students studying to be mathematics and science teachers, the Mzuni senior management and the staff of the ODL Centre. The *division of labour* in this study included the roles of all relevant actors who explicitly influence field facilitation learning and support practice and others who implicitly influence the field facilitation practice. These included module orientation, lecturing, student learning, peer teaching, policy writing and implementation, course and student management and administration, and field facilitation.

The main assumptions within the second-generation Activity Theory that are key to this study's investigation of the field facilitation activity system are discussed below.

1. Humans act collectively, learn by doing, and communicate in and through actions.

The CHAT provides a theory and methodology for examining how individuals or groups with different experiences and perspectives working on the same object individually or jointly develop new knowledge or tools to address the problems they encounter (Daniels, 2001; Engeström, 1987, 1999; Mwanza, 2002). Important in CHAT research on learning is the relationship between learning and the environment in which the learning takes place, especially where there is uncertainty about the real outcomes of that learning process (Reigeluth, 2004). Individuals or groups of people develop new capabilities when they collaborate with others (Blackler et al., 2000) through contradictions, tensions and conflicts experienced in the process of learning and through reflexivity and agency (Engeström, 1987, 2008).

Where two or more groups converge, there are inevitable issues of power relations which may often lead to those with less power being subjected to abuse, objectification and silencing (Freire, 2005; Kumalo, 2018). When such events happen, the marginalised groups require a voice from within the system, or from those "others" around them who have successfully been emancipated from such oppression. Widder (2004) argues that power can also emerge from the marginalised groups because the weaker groups are not passive but rather are agents capable of reorganising, mobilising and fighting for their own liberation.

2. Humans make, employ, and adapt tools of all kinds to learn and communicate.

The CHAT sees learning as being facilitated by conceptual and material tools. As people adapt certain tools to their own ends, they can change the tools and even the activity system. Edwards (2005, p. 50) argues that "learning is concerned with and within-person changes, which modify the way in which we interpret and may act on our world … and in turn change it by our actions". CHAT focuses on activities as historically constructed which provide a variety of tools through which humans can learn and communicate and, in so doing, they adapt and build the tools further.

3. Community is central to the process of making and interpreting meaning, and all forms of communicating and learning.

The CHAT goes beyond the concept of cognition to understand human learning. Human learning is a social process which takes place through continued interaction between the individual or group

and the social environment in which the learning takes place (Hamm, 2003). This community can be physical or virtual. An individual learning on their own is still engaging with an activity system and is affected by the available artefacts, rules and division of labour – all of which will be social in nature. The idea of learning comprising simply individual cognitive processes taking place in the mind of the single student, for example, is thus challenged by CHAT.

Further to the unpacking of the three assumptions above, it is useful to reflect on Engeström's (2001) suggestion that there are five main principles of CHAT, all of which pertain to the second-generation model of Activity Theory used in this study. Using this framework as a means of theoretically framing a study and analysing its data entailed adhering to these principles.

1. The main unit of analysis is the activity system. An understanding of field facilitation at Mzuni thus required understanding it as a complex activity system.
2. Data offers multiple perspectives, interests and traditions. Data is thus "multi-voiced". Members within the activity system who may provide data "carry their own diverse histories" and the system itself "carries multiple layers and strands of history engraved in its artefacts, rules and conventions" (Engeström, 2001, p. 136).
3. The principle of historicity is important because the aspects of the past often stay embedded in the current activity system (Kuutti, 1996).
4. As indicated earlier, contradictions are a vital principle of CHAT as it is understood that contradictions provide tensions that can also drive transformation.
5. The final principle of CHAT that guided this study is that of expansive learning. Expansive learning is when the actual subject of learning is transformed. From individuals, the subjects are transformed into collectives and networks who can reconceptualise the object and motive of the activity and "embrace a radically wider horizon of possibilities than in the previous mode of the activity" (Engeström, 2001, p. 137).

Principles 4 and 5 above contain two key concepts that require further discussion: contradictions and expansive learning.

3.6 Contradictions and Expansive Learning

Contradictions occur when there are inconsistencies or opposing views within any activity system. They are not necessarily troublesome and to be suppressed or avoided. Contradictions can be a source of both personal and social change from which people emerge far better off than before and can be used creatively. One of the ways out of a contradiction is innovation. We can adapt our ideas and practices to new circumstances and learn to be a better person from the experience. Contradictions are key driving forces of expansive learning (Sannino et al., 2016).

Expansive learning was used to provide the scope that enabled the understanding and transformation of the field facilitation activity systems to enhance student learning and success in the ODL B.Ed Science programme. According to Engeström (2009a), the core idea of expansive learning lies in the fact that participants in an activity system collectively learn, model and experiment with the new practices, which are not yet there. Expansive learning is used in surfacing contradictions, collectively modelling new activities or solutions towards an intended object. In essence, expansive learning is learning "in which the participants are involved in constructing and implementing a radically new, wider and more complex object and concept for their activity" (Engeström & Sannino, 2010, p. 2).

Expansive learning places primacy on communities as learners, on transformation and creation of culture, on horizontal movement and hybridisation, and on the formation of theoretical concepts (Rantavuori et al., 2016). This type of learning is explained as "ascending from the abstract to the concrete" (Engeström, 2016, p. 47) which is achieved through specific epistemic or learning actions which are in the form of cycles or spirals. An ideal-typical sequence of learning actions in an expansive cycle are described as follows.

1. The first action of an expansive cycle is that of questioning, criticising, or rejecting some aspects of accepted practice and existing wisdom.
2. The second action is that of analysing the situation. Analysis involves mental, discursive, or practical transformation of the situation in order to discover causes or explanatory mechanisms. Analysis evokes "why" questions and explanatory principles. One type of analysis is historical genetic; it seeks to explain the situation by tracing its origination and

evolution. Another type of analysis is actual-empirical; it seeks to explain the situation by constructing a picture of its inner systemic relations.

3. The third action is that of modelling the newly found explanatory relationship in some publicly observable and transmittable form. This means constructing an explicit, simplified model of the new idea that explains and offers a solution to the problematic situation.
4. The fourth action is that of examining the model, running, operating, and experimenting on it in order to fully grasp its dynamics, potentials, and limitations.
5. The fifth action is that of implementing the model, concretizing it by means of practical applications, enrichments, and conceptual extensions.
6. The sixth and seventh actions are those of reflecting on and evaluating the process and consolidating its outcomes into a new, stable form of practice (Engeström, 2016, p. 47).

However, for this study, the analysis of the field facilitation activity only targeted the first *three* stages of expansive learning namely *questioning, analysis* and *modelling.* This was due to methodological challenges as will be discussed in the methodology chapter (Chapter Four). Figure 3.6 illustrates the expansive transformation process in the activity system.

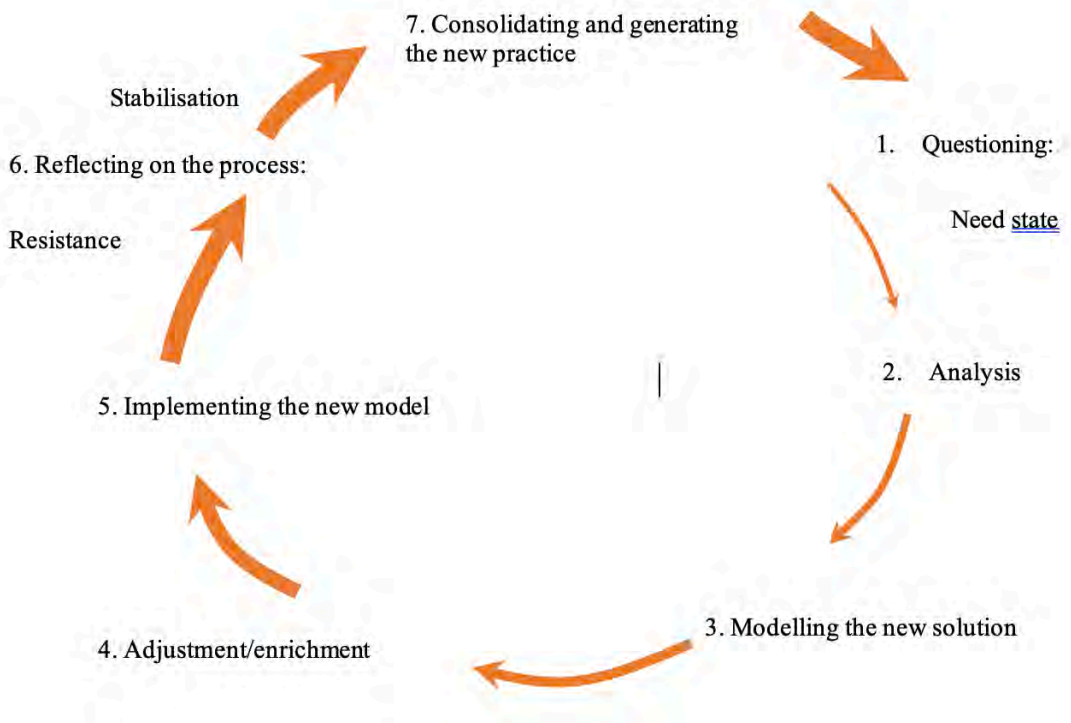


Figure 3.6: An expansive learning cycle

(Engeström, 2016, p. 49)

Expansive learning of this nature is largely driven by the contradictions that emerge because contradictions are "the motive force of change and development" (Engeström & Miettinen, 1999, p. 9). They become the driving forces of expansive learning when subjects deal with them in ways that identify the emerging new object and motive. Therefore, within an activity system, contradictions should be identified so that people can focus on the causes of tensions and rethink relations between the six elements of the activity system. Harvey (2014, p. 7) notes that contradictions "have the nasty habit of not being resolved but merely moved around". That means that resolving a contradiction can result in the creation of another contradiction.

In engaging contradictions as learning drivers, Engeström and Sannino (2011) suggest that two aspects need to be understood. First, a contradiction is a foundational systemic concept that should not be confused with obstacles, tensions, inconsistencies, conflicts, dilemmas or double binds though many of these manifest from a contradiction. Second, contradictions are historical. The way contradictions are operationalised often remains unclear especially as they cannot be directly

observed and empirically analysed. They are spongy and "bleed into one another" (Harvey, 2014, p. 6). It is perhaps because of this blurred nature of contradictions that Engeström and Sannino (2011, p. 221) regard a contradiction as a "broad and vague term, often used to describe different kinds of tensions and problems".

Although contradictions can catalyse transformation in an activity system, this transformation does not always happen as anticipated. This is because contradictions can play a twofold role: allowing learning to progress or constraining it, depending on whether they are acknowledged and resolved or not (Nelson, 2002). In addition, for systemic contradictions to lead to innovation their resolution cannot occur at the individual level. Contradictions happen in social/material relations among groups who hold contrary views to resolve a particular contradiction (Wardle, 2004). As Murphy and Rodríguez-Manzanares (2008) note, some contradictions are invisible. They are usually taken for granted and may not even be recognised as problematic. For example, there might be a cultural assumption about how things should be done and how relationships should be managed. They might not be talked about because they are "embarrassing, uncomfortable or culturally difficult to confront" such as "gender issues or offensive personal habits of politically powerful programme stakeholders" (Murphy & Rodríguez-Manzanares, 2008, p. 446).

While the above offers a description of the different types of contradictions, Foot (2014), offers a different taxonomy by looking at how contradictions emerge at different levels of the expansive learning cycle (see Table 3.2). Given that this study used second-generation Activity Theory and looked at only one activity system, only the first two levels pertain.

Table 3.2: Levels of contradictions in the second-generation Activity Theory

Level corresponding	Description	Learning level	Example
Primary	They are identified when there are persistent dilemmas and relatively few critical conflicts and double binds.	Generate the first learning action of questioning in the expansive learning cycle	Differing views of community members on tool usage. For example, different perceptions on the use of instructional materials (modules) in ODL teaching and learning.

Secondary	Occur between two or more nodes of the activity system.	Generate the second, third and fourth learning actions of analysis, modelling and examining the model	Between a rule and a tool. For example, ODL policy promoting self-paced instruction against the university policy of cohort-based learning as specified in the generic students' information handbook.

Source: Adapted from Engeström (2016, p. 16)

3.7 Expansive Learning and the Zone of Proximal Development

As earlier indicated, Vygotsky argues that the ZPD is the gap between the current competency status of a learner and the potential competency level that could be realised with the support of more capable others (Vygotsky, 1978). Engeström (2000) views expansive learning as movement from actions to activity. The ZPD can thus be redefined as the space for expansive transition from actions to activity (Engeström, 2000). In other words, expansive learning "is the distance between the everyday actions of the individuals and the historically new form of the societal activity that can be collectively generated as a solution to the double bind potentially embedded in the everyday actions" (Engeström, 1987, p. 174). Thus, the ZPD is regarded as a space for expansive learning, a collective responsibility which would lead to a collective ZPD. In this way, ZPD and expansive learning are more or less one and the same in terms of process and contribution towards the learning processes (see an illustration in Figure 3.7 below).

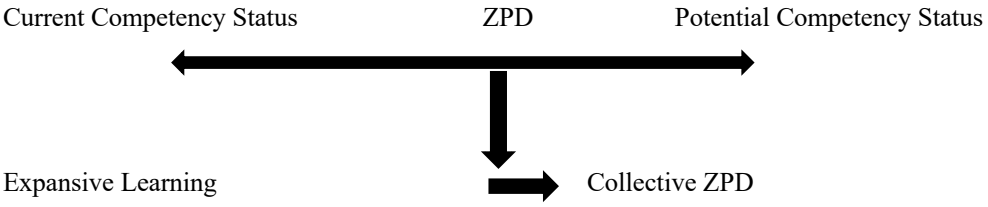


Figure 3.7: The relationship between the ZPD and expansive learning

(Adapted from Engeström, 1987)

Expansive learning of this nature is largely driven by the contradictions that emerge because contradictions are “the motive force of change and development” (Engeström & Miettinen, 1999, p. 9). They become the driving forces of expansive learning when subjects deal with them in ways that identify the emerging new object and motive.

3.8 Conclusion

This chapter offered a brief introduction to the historical background of Activity Theory as the main theoretical framework underpinning this study. The activity system under study in this thesis is the field facilitation activity system and, in this chapter, I outlined the concepts and lenses drawn upon to interrogate this activity system, specifically, second-generation Activity Theory and the ZPD. Although the first, third and fourth generations Activity Theory were also briefly outlined, this study drew on the second-generation model because it is delimited, mainly for pragmatic reasons, to one specific activity system. Further to this, and as will be discussed later in Chapter Four, the study had shortfalls in comprehensively conducting expansive learning methodologically although individual participants in the activity system seemed aware of the areas which need improvement in the field facilitation practice. In the next chapter, the use of this model to guide and structure the methodology and methods that were used to gather the data will be discussed, including the limitations related to the adaptation of the second phase of the study, mentioned in Chapter One.

CHAPTER FOUR: RESEARCH METHODOLOGY

4.1 Introduction

Every empirical study is based on a set of assumptions. The research questions that are asked, the ways in which the data is collected, the ways in which the data is analysed and all other aspects of the research design are inevitably shaped by the understandings of the researcher. In the previous chapter, I outlined the theoretical lenses used and argued for their appropriateness. In this chapter, I undertake a similar task in explaining the research design. In doing so, I attempt to clarify all design choices I took and the constraints and limitations that occurred. I also make a case for the coherence between the theoretical framework outlined in Chapter Three and the methodology outlined here.

I broadly used a qualitative research methodology to generate data for this study. Mertens (2005) defines qualitative research as that which captures holistic pictures using words, observations, stories, visual portrayals, meaningful characterisations, interpretations and other expressive descriptions which vary across contexts. The data is neither in the form of countable metrics nor is it positioned as being an objective, universal Truth (with a capital 'T'). Rather, in keeping with the understandings underpinning CHAT, I attempted to make sense of the cultural, historical activity of the field facilitation strategies. After outlining the general research orientation and the nature of this study as a case study, I describe the research design steps that I implemented.

4.2 Research Orientation and Design

The study was designed and conducted qualitatively using an insider formative interventionist approach (Sannino et al., 2016) where I, as the researcher, did research at the institution where I work. I drew my inspiration from the questions Creswell (2003) asks which happened to be central to the study: First, what knowledge claims are being made by the researcher? Second, what strategies of inquiry informed the procedures? And third, what methods of data collection and analysis were used? As a researcher, I based my qualitative case study on a constructivist paradigm, which says that 'truth' (with a small 't') is relative and dependent on the researcher's

and participants' perspectives on the social phenomenon (Baxter & Jack, 2008). In other words, we all experience our own truths about the world.

The qualitative approach allowed me to gather in-depth understanding of the field facilitation practice as understood by the people involved in the practice. It also allowed me to participate in the research, to interact with the participants, and to mediate a process of new learning and a potentially collective transformative change process. Lektorsky (1980) describes an interventionist researcher as one engaged in ongoing reflective mediation in which their role is seen as a means of supporting and mediating change in activities and creating new collective alternatives and solutions. Hence, the goal in qualitative research that is undertaken with a CHAT lens is to create a research community that is also a learning community (Milne, 2005). In that context, it was important to have maximum participation from the research participants. Lektorsky (1980) further argues that if the study outcomes are accepted by the community, the knowledge obtained may remediate activities and change human reality. Accordingly, Engeström and Sannino (2011) argue that formative intervention design is driven by historically formed contradictions in the activity systems and is the result of the collective efforts of research participants to understand and face these contradictions and the problems they engender.

Within this intervention design, the researcher's role is to intervene by provoking and sustaining the process where the tradition is questioned and means for improvement are suggested (Sannino et al., 2016). Furthermore, this open engagement with "learning what is not yet there" (Engeström, 2016) was used to surface contradictions and mediate engagement with the field facilitators in supporting student learning of Science and Mathematics. The engagement process was a collaborative case study with participants of the field facilitation activity system (field facilitators (subjects)), enhanced learning and success in Science and Mathematics (the object upon which the activity was directed), the community (lecturers, ODL staff, university leadership and ODL students) with responsibilities explicitly affecting field facilitation and the researcher in the exploration of field facilitation practices that enhance learning and success.

4.3 Case Study as a Research Methodology

A case is a noun, a thing, an entity; it is seldom a verb, a principle, a functioning (Stake, 2013). It is a situation requiring investigation. Universities may be our cases – real things that are easy to visualise; students may be our cases – we usually do not define "learning activities" as the case (Stake, 2009 in Merriam, 2009, p. 41). Reflecting on Stake's quotation above, if my study focus was restricted to field facilitation practice, then it could arguably be seen as a functioning and not an entity. I therefore selected the field facilitation activity system as an entity. A case study is an in-depth description and analysis of a bounded system (Merriam, 2009). Yin (2008) defines case study in terms of the research process as "an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident" (p. 18). This was a deciding factor for me in the choice of a case study as it allowed for an in-depth exploration of phenomenon within its context, in other words, the historical, cultural context and predominant field facilitation practices in Science and Mathematics.

In addition, case study methodology is a qualitative approach in which the investigator explores a bounded system (a case) or multiple bounded systems (cases) over time, through detailed, in-depth data collection involving multiple sources of information (e.g., observations, interviews, audio-visual material and documents and reports) (Creswell, 2007). Of particular importance to this study, which is also informed by CHAT, was the delimiting of the bounded system characteristic of a case study. The case study is less of a methodological choice than "a choice of what is to be studied" (Stake, 2005, p. 443). Flyvbjerg (2006) concurs by indicating that a good social science is problem driven and not methodology driven, in the sense that it employs methods to solve a particular problem.

In keeping with all case studies, this case study was particularistic, descriptive and heuristic (Merriam, 2009; Stake, 2005). The above characterisations bring out special features that define qualitative case studies, all of which were pertinent to this study as they were particularistic, descriptive and heuristic. Particularistic means the case study focuses on a particular situation, problem, event, programme or phenomenon. According to Merriam (2009), the specificity of focus makes the case study an especially good design for practical problems – for questions, situations

or puzzling occurrences arising from everyday practice. It is for this reason that I used this method to question field facilitation practice for Science and Mathematics students under the ODL mode of delivery with the aim of transforming the practice. The study was also descriptive, in that I have attempted to provide a rich, "thick" description of the phenomenon under study (Chikunda, 2013). Flyvbjerg (2006, p. 238) calls it "telling the story in its diversity, allowing the story to unfold from the many-sided, complex, and sometimes with conflicting meanings". Heuristic means that case studies should illuminate the reader's understanding of the phenomenon under study. The "naturalistic generalisation" (Stake, 2007, p. 3) provides vicarious instances that merge with existing experience and thereby reinforce or modify the understanding of the experience. For this reason, case studies have been labelled as holistic, lifelike, grounded and explanatory (Merriam, 2009).

Case studies address the "what" question and the "why and how" questions that seek out the explanations (Yin, 2008). Missing, however, is the "so what" question, the question that would address interventionist efforts. To address this, I drew inspiration from Habermas (1972) cited in Cohen et al. (2000, 2010), who from a critical research perspective, sees the need to take advantage of exploration in case studies, but to go beyond them to praxis-action that is informed by reflection. Lotz-Sisitka and Raven (2004) describe case studies as a "step to action" (p. 71) and suggest that case studies can be the basis of change. The "so what" question about the significance of the study is then addressed by the action towards change undertaken within the study or that suggested by the study.

Toma (2011) argues that case study research can fit within the paradigm of participatory research. He argues that the participatory paradigm reflects more experiential reality and is grounded in practical knowledge and consequently creates findings that prompt collaborative practical action. In a similar way, my primary reason for using case study methodology was to provide an in-depth perspective which could be directly interpreted and put to use, with an interest in the "action-based, contextually situated nature of case study methodology" (Lotz-Sisitka & Raven, 2004, p. 71).

4.4 Study Site

The study was situated at Mzuzu University in Malawi thus placing it in one of the lowest ranking countries in terms of income per capita which tells us of a challenged institution and country resource wise (Zozie, 2020; Chawinga & Zozie, 2016). The study targeted ODL and focused on Science and Mathematics disciplines. These fields of study have been identified as a challenge not only in the ODL mode of delivery but even in traditional f2f settings (Gasiewski et al., 2012; Mzuzu Academic Office, 2018).

Using CHAT entailed conceptualising the case study as a field facilitation *activity system*. In response to poor retention and throughput of Science and Mathematics students, the university implemented a field facilitation academic support strategy. However, no study has so far been done to ascertain how effective field facilitation has been in supporting learning in Science and Mathematics in the B.Ed Science programme under the ODL mode of delivery. The study site allowed a consideration of field facilitation as an activity system within resource-constrained environments. It also contributed to larger conversations about ODL and teacher education.

As a Mzuni member of staff responsible for student support services at ODL, I was aware of participants (both students and fellow members of staff) who could provide vital information required for the study. Flyvbjerg (2006) calls this information-oriented selection, where cases are selected on the basis of expectations about their information content but at the same time was conscious of potential blind spots that I may bring to data generation. I refer to issues of my positionality later in this chapter, but it is necessary to raise it briefly here because positionality affects the research design. It was one of the key reasons I used multiple methods of data generation (method triangulation) to ensure that the data generated was trustworthy and sufficient to provide understandings and experiences that I might not have anticipated. This was done in order to maximise the possibility of getting reliable data from a small sample and single institution. Sampling was guided by Engeström's understanding (2007a) that participants in sociocultural research are not "sampled" as such but are rather determined by the object of the activity, hence the selection of the study participants, teacher trainees and lecturers who had participated in field facilitation.

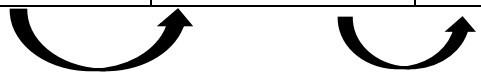
4.5 Data Generation

Data in this study was generated in two phases. Data generation for both phases took almost nine months from March to November 2020. The first phase was contextual profiling which involved the use of paper surveys, interviews (both one-on-one and focus groups) and document analysis in that order but with overlaps and forward and backward movements along the way. Focus group interviews were conducted with students while one-on-one interviews were conducted with field facilitators and lecturers. The documents included all those regulating ODL practice at Mzuni. Data generated in the contextual profiling phase and literature-based data formed the mirror data for the second phase of data generation. Mirror data is designed to reveal present problems, dilemmas, situations and disturbances as well as novel innovative solutions (Daniels, 2008; Sannino, 2008). Mirror data comprises the researcher's collection of an authentic description of the situation which is presented to the practitioners in the Change Laboratory (Cole & Engeström, 2007; Postholm, 2015).

Phase two of the study then involved Change Laboratory Workshops (CLWs) with all three groups of participants: the field facilitators, the students, and the lecturers involved in the B.Ed Science programme. Ideally, CLWs are facilitated in cycles, meaning that the first CLW will generate contradictions which can then be explored in further CLWs. A researcher can create as many CLWs as are necessary to enable the desired expansive learning (Cole & Engeström, 2007; Postholm, 2015). Initially, I designed a series of in-person CLWs at Mzuni for the three groups of participants to engage with the mirror data. However, as indicated in Section 1.2 of the first chapter, I was unable to meet with my participants due to the Covid-19 lockdown conditions in 2020 and 2021. Therefore, I created three WhatsApp groups for the field facilitators, the students and the lecturers. WhatsApp was the obvious choice because everyone had it on their phones already, they were familiar with the platform, and it was inexpensive in terms of data costs. The modified CLWs conducted via WhatsApp are detailed in Section 4.5.2. Table 4.1 illustrates the research design and process.

Table 4.1: Illustration of research design and process

Contextual profiling ➢ Surveys ➢ One-on-one interviews ➢ Focus group interviews ➢ Document analysis	Production of mirror data	Modified Change Laboratory Workshop (WhatsApp groups' data): Generating data that adds value to mirror data generated in contextual profiling phase in a way of traditional practices or novel practices and suggesting improvements to the current field facilitation practices



4.5.1 Phase 1: Contextual profiling

The data that was generated from the contextual profiling phase responded to the first two research questions of this study as follows:

1. What field facilitation strategies are currently being used in the B.Ed Science programme?
2. How effective have current field facilitation strategies been in enhancing learning and success in Science and Mathematics?

This data comprised surveys, focus group interviews with a sample of students from all satellite learning centres and one-on-one interviews with field facilitators sampled from all (five) satellite learning centres and lecturers servicing the B.Ed Science programme from the departments of biology, chemistry, physics and mathematics as well as document analysis.

4.5.1.1 Surveys

The surveys provided descriptive quantitative data which helped me understand the qualitative phenomenon in the form of some descriptive statistics (Yin, 1981). This phase took place at Mzuzu University campus during the f2f module orientation period. Paper-based survey questionnaires were administered to 140 ODL Science and Mathematics teacher trainees in the B.Ed Science programme in years two to five. The paper-based survey questions were used considering the ICT competencies and accessibility concerns concerning ICT gadgets among the survey respondents (see Appendix 5).

The B.Ed Science teacher trainee students were selected for this study because this was the target group for the extra field facilitation academic support strategy since they were considered by the ODL Steering Committee of Mzuni to be at a higher risk of dropping out (D11) based on assessment statistics three years after the introduction of ODL programmes at Mzuni in 2011 (see Chapter One). The surveys targeted only those students who had attended field facilitation sessions and had knowledge and experience of what happened during field facilitation sessions. Students in years two to five were targeted because they had been in the university for at least one academic year and had experienced field facilitation as they had participated in field facilitation at least once.

The filling in of the survey questionnaires was done on the Mzuni campus after the conclusion of field facilitation sessions in the Satellite Learning Centres. This was during the science practical sessions which took place for four weeks before sitting for end-of-semester examinations. Class student representatives helped in the distribution of questionnaires since they knew their Science and Mathematics cohort mates. However, this phase was characterised by a low response rate of 65 respondents out of 140 targeted participants, representing a 46% response rate. The reasons for the low response rate were not clearly known to the researcher. However, that would be a reflection of student attendance at the field facilitation sessions as students who had recently not attended field facilitation sessions might not have the current information concerning field facilitation experiences. Nonetheless, this response rate was considered a reasonable basis from which to begin to develop an overview of the participants. The survey provided such background information as gender, urban/rural distribution, accessibility to ICT facilities, knowledge and skills on the use of ICT tools and how far away the student participants were from the nearest Satellite Learning Centres.

4.5.1.2 Focus group interviews with students

Focus group interviews were conducted with groups of students sampled from all five satellite learning centres, namely, Karonga, Mzuzu, Lilongwe, Balaka and Mulanje. These are Mzuni's designated ODL satellite learning centres and they represent all three regions of the country – north (Karonga and Mzuzu), centre (Lilongwe) and south (Balaka and Mulanje) (see Figure 1.1). The focus group interviews were conducted with students in cohorts three, four, five and six who were in years five, four, three and two respectively. It was assumed that such students would have

adequate information on field facilitation academic support activities since they participated in field facilitation sessions at least once as they had been at the university for at least a semester.

I invited the students to participate in focus group interviews. The invitation went to the students through the cluster leaders. The cluster leaders were the students who coordinated field facilitation activities on behalf of the ODL centre of Mzuni. I took advantage of the students' availability on campus during the science practicals by holding the focus group interviews during that time. The interviews were therefore held in the ODL boardroom at the ODL centre of Mzuni. The interviewees were grouped according to the satellite learning centres they attended the field facilitation sessions. The students consented to the participation in the research through a letter of consent which was individually signed by the students (see Appendix 2).

The students were questioned for in-depth understanding of their experiences and knowledge about field facilitation as an academic support strategy in sciences and mathematics (see Appendix 6). One focus group interview was done per ODL satellite learning centre targeting the five centres for a total of five interviews. The number of participants in each focus group interview varied from five to eight depending on their availability. Each focus group interview comprised at least one student from years two to five of study and a cluster leader who was also a student. The cluster leaders were senior students in year five of study. Table 4.2 below summarises the attendance of focus group interviews by the students per satellite learning centre.

Table 4.2: Summary of students' attendance at focus group interviews per satellite learning centre

Name of the Satellite Learning Centre	**Number of students in the focus group interview**
Mulanje (MJ)	6
Balaka (BLK)	5
Lilongwe (LL)	8
Mzuzu (MZ)	7

Karonga (KA)	5

4.5.1.3 Individual interviews with field facilitators

The number of field facilitators per satellite learning centre varied from one satellite learning centre to the other. The number of field facilitators per satellite learning centre varied from two to four. The four field facilitators facilitated biology, chemistry, physics and mathematics respectively. Due to non-availability of some field facilitators in some satellite learning centres, some courses were not facilitated, and in some cases, one field facilitator handled two courses across the entire B.Ed Science programme from years one to five.

I ensured that one field facilitator from each of the five satellite learning centres was interviewed depending on their availability. To remind the reader, the field facilitators were not the full-time employees of Mzuni. They were employed elsewhere as full-time secondary school teachers and only worked for Mzuni on part-time basis. The field facilitators were telephonically interviewed for convenience reasons. I sought the consent of field facilitators for the recording of the phone conversations (see Appendix 3). It was a challenge to arrange for f2f interviews with the field facilitators as they were not full-time employees of Mzuni and were scattered across the country, as described in Chapter One (see Figure 1.1). Table 4.3 below summarises the one-on-one interviews with the field facilitators and their course specialisation (see also Appendix 7).

Table 4.3: Summary of one-on-one interviews with the field facilitators

Name of the Satellite Learning Centre	Field facilitator course specialisation	Number of course facilitators	Facilitation load
Mulanje (MJ)	Physics and mathematics	1	One - Physics
Balaka (BLK)	Chemistry and physics	1	Both
Lilongwe (LL)	Biology and chemistry	1	One - Chemistry

Mzuzu (MZ)	Mathematics and biology	1	One - Biology
Karonga (KA)	Physics and mathematics	1	Both

4.5.1.4 Individual interviews with lecturers

Three science and one mathematics lecturer were interviewed individually as well (see Appendix 8). The interviews were held according to the participants' convenience in terms of venue and time. The participants chose the time of the interviews and they were held in their offices on their campus. In addition, the interviews were done face-to-face since they were available for face-to-face interviews as they are my work colleagues. One participant was purposively sampled from a pool of lecturers from each of the four departments of biology, chemistry, physics and mathematics. They were sampled because they participated in module or curriculum orientation of Science and Mathematics courses in the ODL B.Ed Science programme. Besides participating in ODL course orientation, they were also teachers by training as they all had a B.Ed qualification before being employed as lecturers. Being B.Ed holders acted as a resource in terms of ways and means of knowing (teaching and learning). These lecturer participants were purposively sampled as there were other lecturers who were involved in ODL course delivery who are not B.Ed holders. Before the commencement of the interviews, I sought the consent from the lecturers (see Appendix 4).

4.5.1.5 Document analysis

Document analysis was the fifth method used in the contextual profiling phase of the data generation process. Table 4.4 below summarises the documents that were analysed.

Table 4.4: Summary of documents analysed

Document identifier	Name, description and location of the document	Year of publication	Purpose of the document
D1	University Act and Statutes. A 52-page document located in the office of the University Registrar under the overall supervision of the Vice Chancellor.	1997	Mandates the public universities to find means of broadening access to university education by all the deserving candidates in Malawi. Mandates the university to create centres of learning one of which is the ODL Centre to ensure equitable access to university education in Malawi.
D2	Mzuzu University Employment Policy. An 83-page document located in the Office of Human Resources under the overall supervision of the University Registrar.	1997	Provides work guidelines to academic members of staff at Mzuni.
D3	Mzuzu University Admission Policy located in the office of the University Registrar under admissions section.	2023 version still in draft form	Two complementing admission bodies, the national higher education regulator (National Council for Higher Education (NCHE - Malawi)) and the local institutionalised Mzuni admissions policies. The NCHE – Malawi (National Regulator) selects students into the public universities in Malawi first and local admissions body (Mzuni admissions body) selects afterwards.
D4	Mzuzu University ODL policy. A 62-page document located at the CODL.	2021 (Not available online)	Regulates the provision of ODL at Mzuni.
D5	Malawi ODL Policy (draft). A 36-page document located the directorate for Distance education under the Ministry of Education (recently established).	Not yet published	Regulates the provision of ODL in Malawi.

D6	Faculty of Education Curriculum Document located in the office of the Dean of Education.	2016	Generic curriculum document (catering for both f2f and ODL students). Different course durations for face-to-face and ODL programmes.
D7	ODL instructional module by the Faculty of Education.	2011	Specifically designed and developed for ODL students to support self-regulated learning among ODL students. Both in print and electronic formats. The electronic format includes the PDF format, PowerPoint-audio embedded and multimedia rich module on Moodle.
D8	Mzuzu University Students Information Handbook. A 101-page document located in the office of the University Registrar under Student Affairs section.	2005	Generic document (serves both f2f and ODL students).
D9	Mzuzu University ODL Field Facilitator contract collaboration form. A three-page document located in the CODL.	2014	Provides conditions or guidelines on how the field facilitators are to carry out their roles.
D10	Mzuzu University Field Facilitator attendance form. A one-page sheet located in the CODL.	2014	Keeps a record of field facilitator attendance during field facilitation sessions to guide field facilitator payment by the university.
D11	ODL Steering Committee (Now ODL Technical Committee) Minutes kept at the CODL Minutes of meetings of the ODL Steering Committee which is composed of heads of departments and chaired by the ODL directorate.	2014	Provides technical advice to the Vice Chancellor on the functionality of ODL.
D12	Mzuzu University ODL Assessment Statistics located in the office of the University Registrar under Academic section.	2016	Managed by the ICT directorate under the instructions of the office of the University Registrar to inform decision making in academic

			support strategies and initiatives.
D13	Field facilitator (tutor) advert.	2014	Specifying the qualities of the field facilitator.

All the data collection activities of the first phase of data generation, contextual profiling, contributed to the mirror data that informed the activities of the next phase of data generation of WhatsApp group discussions.

4.5.2 Phase 2: Modified Change Laboratory Workshops

As indicated earlier in this chapter, the CLW phase of the study had to be modified and facilitated on social media through WhatsApp because of the restrictions imposed during the Covid-19 pandemic. The WhatsApp group discussions were initiated to complement the data that was collected during the first phase of contextual profiling. This was an attempt to meet a particular need of expansive learning (Virkkunen & Newnham, 2013). In this study context, this is termed '*new learning'* and responds to research objective *three* (see Chapter One, Section 1.6) which seeks to determine *how the current field facilitation strategies would be expanded to enhance students' learning and success in Science and Mathematics under the ODL delivery mode.* Improvement in a practice entails progressive changes in doing things to make the practice better than before. In other words, this involves change in the professional practice, which is *new learning*.

In this study, informal discussion groups through WhatsApp were conducted to expand the participants' knowledge of field facilitation following the surfacing of contradictions in the mirror data from the contextual profiling phase. I created three WhatsApp groups – for students, field facilitators, and lecturers – as I was aware of the power differentials that existed among my research participants and was concerned that mediating the discussion of mirror data in a shared WhatsApp group might privilege those with more institutional power. For example, the lecturers would have been more privileged and would likely have contributed more than the field facilitators

and the students. This would likely equally be the case between field facilitators and students. This would eventually lead to silencing of students who were critical informants in this study.

To start the discussion with each group, I posted a message in each group welcoming all of them to the group and explaining that this phase of the study continued from and built on phase 1. I explained that the focus of the WhatsApp groups was to discuss tensions and points of disagreement or differences that were raised by each participant group in phase 1. For example, in the field facilitator group, I shared comments that the lecturers and students had made about their experience and understanding of field facilitation and asked the field facilitators to respond, which they did. I did a similar thing with the other two WhatsApp groups. This generated an initial series of comments and discussion, however, in conversation with my supervisors, we decided to push for a further modified CLW process to enrich this data and adhere as closely as we could in the circumstances to the CHAT method. In these further discussions I shared the emerging issues and ideas raised in the first set of comments and debates in the WhatsApp groups as the discussions continued. This generated richer data, considering the limitations of working in social media, where participants may not always type in full sentences or express themselves as fully as they may have in a face-to-face workshop. Please see Appendices 9-11 for excerpts from these discussions.

The figure below illustrates the design of the three WhatsApp groups. The cycles in each of the three groups represent the possibilities of expansive learning. The arrows in-between the three groups represent the deliberate move I made of reminding, updating and sharing among the discussants the earlier (contextual profiling) and latest developments in the activity. The rectangular outer border represents the bounded field facilitation activity system which is of course porous to other systems due to the external influence of the community in which the activity takes place (the significant others) (Engstrom & Sannino, 2021).

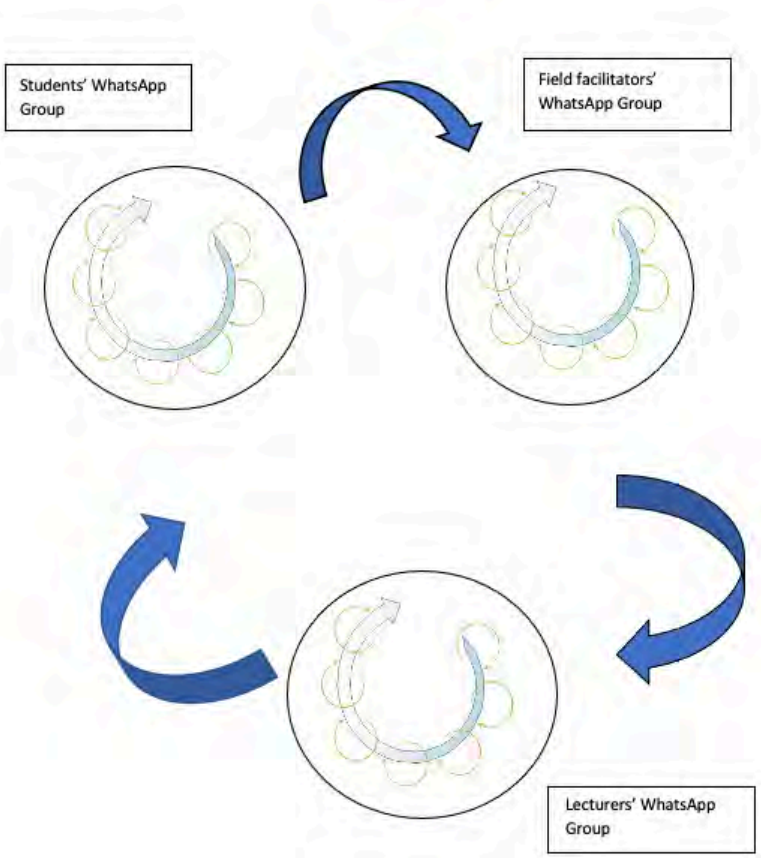


Figure 4.1: The design of the three CLWs (WhatsApp Groups)

(Adapted from Engeström, 1996)

I oriented the newcomers to the study (those who did not participate in data generation in the contextual profiling phase) to the second phase of data generation from WhatsApp groups for all categories of research participants. I outlined the expectations and the key themes in the form of contradictions and discontinuities that emerged in the contextual profiling phase of the data generation process. WhatsApp groups were created to generate qualitative data that would confirm, contradict or strengthen what emerged from the contextual profiling data. This was done to allow the participants to confirm the data generated in the contextual profiling phase.

In embarking on the WhatsApp discussions, I was clear about the need to initiate cycles of discussions in which participants, with the help of mirror data and existing historical, cultural and social artefacts, were offered an opportunity to reconceptualise the object of their work and create new meaning. The participants and I shared the same conceptual tools in the process of analysing, repositioning and redesigning practice (Daniels, 2008; Sannino, 2008).

Contradictions and ideas raised in each of the three groups were shared with the other groups. This technique was used to obtain rich data from different participant perspectives working towards the same object of an improved field facilitation strategy that would enhance student learning experiences and their success in Science and Mathematics. In addition, the setting up of WhatsApp groups comprising participants from different courses helped in breaking the course divide that characterises most tertiary institutions in general, which can make science learning highly departmentalised or compartmentalised instead of it being holistic (Dzama, 2006).

Work in the WhatsApp groups started with information gained from the contextual profiling phase, in this case from surveys, interviews (one-on-one and focus group interviews) and document analysis. The data from the contextual profiling phase revealed inconsistencies between policies (Mzuni policies) and field facilitation practice. These inconsistencies were shared with the workshop participants of each WhatsApp group. Participants of each group made comments on the presented inconsistencies. This kickstarted expansive learning as participants started questioning the practice based on the mirror data that I presented. Comments from each group were then shared with the participants in the other groups and this process went on and on in a cyclical manner (see Figure 4.1 above).

Conversations within the expansive learning process involves communities in constructing and implementing new, wider and more complex objects and concepts for an activity (Engeström & Sannino, 2010). In this study, as discussions went on, reflecting on the mirror data *(questioning)* and analysing the mirror data *(analysis)*, participants in their different groups came up with ideas on how the field facilitation practice could be improved *(modelling)* (see Table 4.5). This is the expansive learning that took place though with limitations due to methodological challenges. I planned for f2f discussions, however, due to Covid-19 restrictions as recommended nationally and globally (WHO, 2020), I changed the design from f2f to virtual discussions. This is potentially a

contribution of the study in that this innovation allowed me to continue with the study despite the pandemic and offers possibilities for others who, for various reasons, may not be able to implement a f2f discussion strategy as a means of data generation. This enables flexibility in data generation in research as it permits qualitative researchers to generate data beyond the constraints of place and time. While the use of WhatsApp allowed me to continue with the study and to offer the findings of this study, this was also a major limitation regarding the richness of the data. The limitations were due to the absence of body language such as gestures, facial expressions and other equally important cues which are communication supports.

Table 4.5: Summary of expansive learning actions in the field facilitation activity system

Data generation Phase	Type of data	Learning actions	Type of contradictions
Contextual profiling	Mirror data	Questioning and analysis	Primary and secondary
Change Laboratory through WhatsApp	Confirmation of mirror from WhatsApp discussions	Questioning, analysis and modelling	Primary and secondary

A detailed discussion on the contradictions and expansive learning will be given in Chapter Six.

4.6 Data Analysis and Coding

A qualitative case study design is emergent where the researcher usually does not know ahead of time every person that might be included in data generation, all the questions that might be asked, or where to look next – the process of data generation and analysis is recursive and dynamic (Merriam, 2009). Data analysis is the process of making sense of the data and this involves consolidating, reducing and interpreting what people have said and what the researcher has seen and read (Merriam, 2009). I simultaneously analysed data as I generated it. Simultaneous data generation and analysis occurred both in and out of the field. However, analysis became more intensive in-between the two phases of the research (contextual profiling and WhatsApp groups

phases), and once all the data was in, that is, at the end of the study, some of Bogdan and Biklen's (2007) suggestions, discussed below, were very helpful in analysing data and these are as follows:

- Developing analytical questions: Going into the field I was always conscious of which of the research goals would be addressed and with what information.
- Planning data collection sessions according to what was found in previous sessions: This forced me to review field notes, interview guides and tools and generally to pursue specific leads in subsequent data collection sessions. Exploring literature while in the field was also another technique that was helpful in data analysis. Going through substantive literature assisted in verifying and shedding perspectives on and sharpening hunches and working on hypotheses and educated guesses, adding rigour to the analysis. Intensive data analysis was usually preceded by data organisation and management. To facilitate analysis, I coded all the interviews (focus group and individual) that were held. Individual participation in WhatsApp discussions was also coded. A category is a theme, a pattern or an answer to a research question (Merriam, 2009). For example, as I read the first interview transcript or field notes, I highlighted and made notations next to bits of data that had the potential for answering my research questions. This form of coding is often called open coding (Chikunda, 2013), because I was still open to anything possible at this point of data analysis. After open coding I went on to do what Corbin and Strauss (2007) call axial coding or analytical coding. This coding goes beyond descriptive coding; it is coding that comes from interpretation and reflection of meaning. This involved grouping notes and comments that seemed to go together. For example, Marshall and Rossman (2006) visualise categories as "containers or baskets into which segments of text are placed" (p. 159). Merriam (2009) raises some criteria for category construction that I found useful. Categories included:
    - Responsiveness to the purpose of the research: in this sense all the categories that I came up with answered the research question in one way or the other.
    - Exhaustiveness; though not simple and straightforward: I tried to come up with categories that captured all the data.

- Mutual exclusivity: I tried to make sure that a unit of data fitted into one category only. Category construction follows an inductive process: I used bits and pieces of information from surveys, interviews, discussions and document analysis to build concepts and theories that produced mirror data.

The mirror data from the first phase of data generation surfaced or showed some differences, inconsistencies and ambiguities in the field facilitation practice which were the potential sources of contradictions in the field facilitation activity system. I therefore mirrored these differences, inconsistencies and ambiguities to the research participants for purposes of questioning, analysis, modelling, examining and testing the model, implementing the model, reflection on the model and consolidating and generalising the new model. However, due to Covid-19 restrictions, my design of the second phase of data generation was modified (see Section 4.5.2) and this further resulted in the modification of phase 2 of data generation. The phase 2 data generation modification enabled the study to manage the first three levels of expansive learning (questioning, analysis and modelling). Therefore, the participants went through the processes of questioning, analysis and modelling based on the mirror data that I presented to them. This expansive process resulted in the generation of expansive learning data. The entire process of analysis of both contextual profiling data and the modified Change Laboratory data is presented in Table 4.6 below.

Table 4.6: Summary of data analysis processes and coding

Data collection phase	Data collection method	Participant	Place of data collection	Data code
Contextual profiling phase	Surveys	Students	Mzuni main campus	Survey
	Focus group interviews	Students	Mzuni main campus categorised according to satellite learning centre	FGI
			Balaka (BLK)	BLK-FGI
			Karonga (KA)	KA-FGI
			Lilongwe (LL)	LL-FGI
			Mzuzu (MZ)	MZ-FGI

			Mulanje (MJ)	MJ-FGI
	One-on-one interviews	Field facilitators	Done telephonically covering all Satellite Learning Centres of Mzuni	FF
			Balaka	BLK-FF
			Karonga	KA-FF
			Lilongwe	LL-FF
			Mzuzu	MZ-FF
			Mulanje	MJ-FF
		Lecturers	Done f2f at Mzuni main campus covering four lecturers one from each of the following courses: mathematics, physics, biology and chemistry	L
			Mathematics (M)	LM
			Physics (P)	LP
			Biology (B)	LB
			Chemistry (C)	LC
Document analysis		Mzuni documents	Documents 1 to 13 (only those relevant to field facilitation)	D1 to D13
WhatsApp discussions	WhatsApp groups	Students	Online	SWG
		Field facilitators	Online	FFWG
		Lecturers	Online	LWG

4.7 Ensuring Data Trustworthiness

In qualitative research, the standards of validity, reliability, generalisability and objectivity are broadly termed trustworthiness (Toma, 2011). This is different to (most) quantitative research,

which rests on an understanding of the Truth as objective and prove-able. In such research, there is thus a need to produce quality research that can be seen to have validity (an accurate measure of what it sets out to measure), reliability (the same results are obtained each time), generalisability (the results will be the same in all contexts that meet the stipulated conditions) and objectivity (the researcher's positionality has not affected the study).

In a qualitative study, and in particular in this case study which uses CHAT as its theoretical lens, all of these mentioned quality indicators are irrelevant. The truth that this study is concerned with varies from context to context and even within the specific activity system. Indeed, it is the contradictions within the truths that are evident in the data that form the core of the study. In response to the quality indicators discussed above, Toma (2011) suggests that qualitative researchers establish the trustworthiness of their findings by demonstrating that they are:

- credible (in preference to valid);
- transferable (in preference to generalisable);
- dependable (in preference to reliable);
- conformable (in preference to objective).

In this study, I worked with these four standards to ensure data trustworthiness, though with some amendments, as I explain below.

Credibility is established if participants agree with the constructions and interpretations of the researcher, that is, the description of the case is accurate based on the understanding of those studied (Toma, 2011). Marshall and Rossman (2011) further clarify that reporting processes and interactions within the boundaries of the cases with sufficient depth satisfies the credibility standard. Stressing that human beings are the primary instrument of data collection and analysis in qualitative research, Merriam (2009) urges researchers to ask themselves the following questions to ensure credibility: How congruent are the findings with reality? Do the findings capture what is really there? Are investigators measuring what they think they are measuring? Patton (2002) argues that credibility hinges partially on the integrity of the researcher. Reflexivity or the researcher's position is a credibility strategy that is also related to the integrity of the

qualitative researcher (Merriam, 2009). It involves the process of reflecting critically on the self as researcher. As an investigator, I needed to be in control of my biases, dispositions and assumptions regarding the research to be undertaken. Researching my own institution and working with CHAT and the ZPD, I could not claim neutrality nor ideological or political innocence. As Maxwell (2005) argues, being explicit about this will help the reader to understand how my values and expectations (as a researcher) influenced the conduct and conclusion of the study. Without this, it would be impossible to be reflexive. Peer review, also called peer examination, is another strategy that I used for credibility purposes. I used critical feedback on my work from my classmates, colleagues and supervisors. Constructive comments from my supervisors and observations from a critical friend helped me to check on biases that I had.

In this study I ensured adequate engagement in the data collection process and reflexivity as strategies to enhance credibility. Merriam (2009) cited Denzin (1978) who proposes four types of triangulations, two of which I found useful in this study: the use of multiple methods and multiple sources of data to confirm emerging findings. I generated multiple forms of data to fully understand the elements of this activity system and to get at the contradictions and spaces where expansive learning may have occurred (or not). With regard to multiple methods of data generation, I used surveys, interviews (individual and focus group), document analysis and WhatsApp discussions. For example, I verified what was obtained from survey data with data from focus group interviews with students. The findings from the survey data were enriched by data from focus group interviews as I probed the students to explain further. Insights from the survey data were also used to design the interview schedules for the one-on-one interviews with the lecturers and field facilitators. These data – surveys, focus groups and interviews – were supplemented by document analysis. Shenton (2004) supports this form of data generation pointing out that individual viewpoints and experiences can be verified against others and, ultimately, a rich picture of attitudes, needs or behaviour of those under scrutiny may be constructed based on the contributions of a range of people and sources.

I found persistent engagement with data reasonably useful as a credibility strategy. Throughout the data generation process, I tried to be as close as I could to participants to obtain in-depth inside information on participants' understanding of the phenomenon under study. The indicator here

was the generation of huge amounts of data especially in the contextual profiling phase. As time went on, I began seeing some patterns emerging from the data collected in the contextual profiling phase, especially from focus group interviews with students and individual interviews with lecturers and field facilitators.

Transferability replaced the notion of generalisability in this study. The CHAT understands activity systems as emerging from their cultural-historical context. The idea that the findings can simply be taken as true for other activity systems thus becomes highly problematic. However, there is a desire in CHAT research to not only enable expansive learning within the activity system under study but to offer insights which can be transferred to new contexts. The knowledge offered in this study cannot thus claim to be generalisable to other contexts but rather as something that is offered to the researchers in the field to consider the extent to which it transfers to offer insights about other systems.

Dependability is another quality indicator I took note of in my attempt to ensure research rigour and trustworthiness. Dependability as it applies to qualitative research is ensured by the following attributes (Toma, 2011) that I adhered to throughout the research journey: (a) a study design that is congruent with research questions (see research questions); an explicit explanation of the status and roles of the researcher within the research site; (b) findings showing parallelism across data sources; (c) specifying basic theoretical constructs and analytical frameworks; (d) collecting data across a full range of settings; and (e) peer reviewing.

Conformability is concerned with ensuring as far as possible that the research findings are the reflection of the experiences and ideas of the participants rather than the characteristics and preferences of the researcher (Shenton, 2004). To adhere to conformability, I used multiple data sources and methods to reduce the effect of my positionality as a researcher. I further tried to critique the methods and theories that I used seeking to respond to their shortcomings and potential effects as far as possible.

4.8 Ethical Considerations

In keeping with the principle of credible research, I observed ethical processes that included: seeking prior informed consent, obtaining access and acceptance, avoiding emotional harm and

deception of participants through misrepresentation, ensuring privacy and anonymity of participants and confidentiality of information. Cohen et al. (2017) define informed consent as the procedures in which individuals choose whether to participate in an investigation after being informed of the benefits or risks associated with an investigation. This definition involves four elements that were key in my research journey: competence, voluntarism, full information and comprehension. Competence implies that reasonable, mature individuals will make correct decisions when they are given the relevant information. Working with lecturers, field facilitators and students, I had no problem with this element. Voluntarism entails applying the principle of informed consent and thus ensuring that participants freely choose to take part (or not) in the research. Full information implies that the participant is fully informed about the research project. It is often practically impossible to fully inform the participants about everything at the onset of the project as the data collection process in research is a continuous process (Klykken, 2022). However, I made sure that the prospective participants were aware of the major steps in the research process such as the goal, the methodology, dissemination of information and the right to withdraw through the process explained below.

Obtaining acceptance was another ethical parameter that I followed. I first had to get ethical clearance from the Faculty of Education Higher Degrees Committee of Rhodes University (see Appendix 12). However, a challenge I had to consider was whether the participants, especially the lecturers, would understand my research endeavour and feel free to share their honest opinions and insights. What I mean here is if they perceived my study as questioning the traditional wisdom and practice, they may have been more reserved in their interviews. As a teacher by training myself, I was able to empathise with the lecturers' position and concerns and could reassure them that I was not evaluating them or questioning their methods. Rather, I could reassure them that we were all in this together and I reminded them of the shared object(ive) of enhancing student success that we are all invested in. Being a member of the ODL Centre and the researcher at the same time was a factor I had to carefully manage in how I recruited participants, shared the aims of the study with them and managed my interactions with them. For example, many of the students knew me as one of the ODL Centre staff, which could have influenced their decision to attend the focus group interviews or share their stories freely with me. To manage these challenges, I engaged with the

student cluster leaders who were closer to me professionally to help me communicate the purposes of the study and my goals and aims (e.g., their studies would not be affected in any way).

In the case of focus group interviews and individual field facilitator and lecturer interviews, I prepared an outline in writing of the precise nature and scope of the research. The next step was to make actual contact with the then would-be participants. After identifying significant figures, I formally wrote to them requesting their participation in my research. In the formal letter I tried by every means possible to adhere to the principle of honesty in research. I also outlined the whole plan of the study. By so doing I was fulfilling the principles of informed consent, obtaining access and acceptance and to some extent that of avoiding emotional harm, the latter being an ethical concern that I attended to throughout the research process. Cohen et al. (2000) and Suri (2020) list some ethical considerations that I also found useful: all participants should be offered the opportunity to remain anonymous and all information should be treated with strictest confidence. To abide by these principles, I ensured that all information revealed by the participants did not in any way reveal their identity. To achieve this, I used codes to describe the information given (see Table 4.5). This guaranteed the participants the promised privacy. Other techniques that I put in place to guarantee confidentiality included deletion of identifiers e.g., names, addresses, departmental identities etc.

4.8.1 My positionality as a researcher

As an employee of Mzuzu University, positionality did apply in my research project as I held endogenous researcher status (Trowler, 2011; Ross, 2017). An endogenous researcher is an insider researcher who conducts research at their own workplace. This is at the ODL Centre at Mzuzu University in Malawi where I work as the Student Support Services Manager where my overall responsibility is planning, designing, facilitating, overseeing and reviewing all activities related to ensuring that students are able to progress, complete and achieve the intended learning outcomes of the study programme (taken from my job description). This status accords me dual status of being seen both as an academic member of staff and an administrative staff member. My interactions with academic members of staff would not be neutral as some would see me as a fellow academic with whom they could freely interact with and share information.

On the other hand, some academic members would see me in an administrative role. If I was seen as an administrator, there was a potential risk of lecturer participants in my research regarding me as policing them or finding fault in their professional practice. There was a possibility of lecturer participants regarding my questions as undermining and threatening their professional autonomy and integrity. To deal with this problem, I had to be conscious of how to approach lecturer participants during the interviews. I explained to them that my research, by pointing to issues or problems with field facilitation which were there and real, was aimed at how we as a team could improve ODL students' learning experiences so that they are able to progress and graduate in the B.Ed Science programme. My engagement with the research context involved challenging and questioning the traditional practices that affect the field facilitation context (Barrett et al., 2020). I had to approach the research participants (students, field facilitators and lecturers) beforehand and separately for such briefings. Only those lecturers who were free or available and willing to participate in my research were engaged. These were lecturers who taught ODL students in the B.Ed Science programme. Likewise, field facilitators who support ODL students in the B.Ed Science programme and B.Ed Science students were engaged. However, as an insider as mentioned earlier in this section, it was easier to have access to participants and interact with all of them (students, field facilitators and lecturers) since I worked closely with them.

4.9 Conclusion

This chapter offered an outline of the methodology used. It discussed how data was collected and analysed. Importantly, it argued that taking a CHAT theoretical lens in the study required particular methodological approaches – contextual profiling and Change Laboratory. While the chapter also addressed the ethical issues and some of the limitations of the study, it will only be through the presentation of the findings that the reader will be able to determine the trustworthiness of the study's contribution. It is to these findings that the next chapter (Chapter Five) turns.

CHAPTER FIVE: FIELD FACILITATION AS AN ACTIVITY SYSTEM – DATA PRESENTATION AND DISCUSSION

5.1 Introduction

This chapter provides a detailed look at how the field facilitation functioned as an activity system. The data here is largely drawn from the contextual profiling phase, although data from the CLW phase has been included where relevant. In this chapter, I respond to the first two questions of the study as follows. First, *What field facilitation strategies are currently being used in the B.Ed Science programme under the ODL mode of delivery?* And second, *How effective or ineffective have current field facilitation strategies been in enhancing learning and success in Science and Mathematics in the B.Ed Science programme under the ODL mode of delivery?*

As indicated in Chapter Four, the study design was adapted due to the constraints of the context. This required flexibility on my part as the researcher but limited the extent to which the study could undertake authentic CLWs. Despite this, the rich data enabled a clear mapping of the activity system to be produced. I draw from across the data sources outlined in Chapter Four to analyse each of the components of the field facilitation activity system.

In expanding on each of the components in this chapter, I had to be cautious not to present each component as if it functioned as a discrete entity but rather as a collective activity system (Foot, 2014). Engeström and Sannino (2021, p. 5) indicate that "an activity system is more than a mechanical sum of its components. An activity weaves together its own dynamic context". For this reason, the highlighting of contradictions is interspersed within the discussion about each component to demonstrate how this component functioned within the larger collective activity system. In other words, the contradictions are not presented as neatly bounded but with some overlaps with other components within the bounded field facilitation activity system. Chapter Six, which follows, picks up on the system-wide issues to discuss contradictions and possibilities for expansive learning in the future.

The diagram below indicates each of the components of the field facilitation activity system at Mzuzu University. By considering each component of this activity system in this chapter, I am able to indicate some of the complexities that emerged in ensuring that there was some shared understanding of the object of the system and that the components were productively directed towards the achievement of the object.

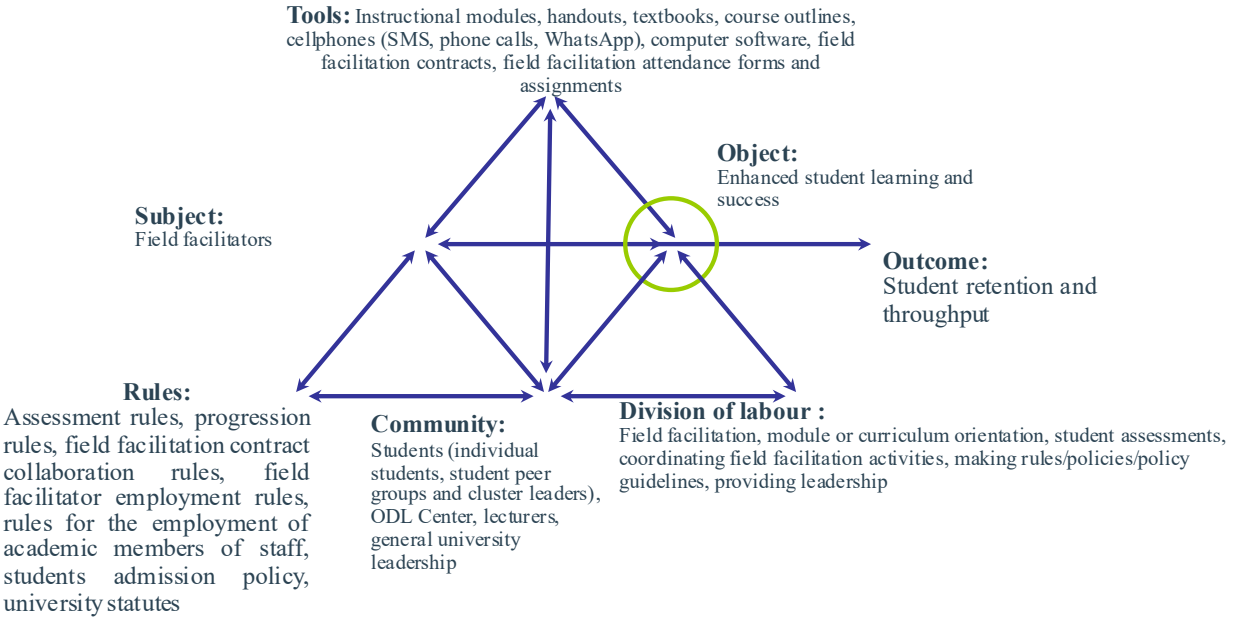


Figure 5.1: The field facilitation activity system of Mzuni

(Adapted from Engeström, 2001)

5.2 The Object

The object of the field facilitation activity system is enhanced student learning and success which in the long run would result in enhanced retention and throughput. This is the collective object towards which all the participants in the activity system are supposed to direct their energy and efforts. The object in an activity system acts as a guide to participants in the activity system which enables them to work in collaborative and coordinated ways towards the overall outcome of the activity.

Engeström (2016, p. 41) asserts that the object holds the community together and gives it long-term purpose: "It is the true carrier of the motive of the activity". In the case of ODL at Mzuni, the object is constructed to enable all the members of the field facilitation community to use their resources to assist students in the B.Ed Science programme to have their learning experiences enhanced and succeed so that they stay in the programme (retention), progress through the programme, and graduate successfully (throughput). This is the shared object of the field facilitation activity system where different actors in the activity system play distinct roles as will be discussed in this chapter.

While there was a general envisioned object of enhancing students' learning experiences and success, there were subtle distinctions in the way in which this was understood which necessitated participants acting in quite distinct ways with distinct goals or motives. In the case of the actual field facilitation sessions by field facilitators, it was more about remediation which was about helping students learn and succeed which would eventually result in retention and throughput. In the case of lecturers, it was more about module orientation which focused on introducing the curriculum to the students by taking students through the module for the particular semester. However, on the side of the individual students, it was about passing the examinations so that they could move to the next semester (progression) and eventual graduation.

5.2.1 The field facilitators' remediation motive

Remediation refers to the practice of re-teaching the content that students previously failed to learn. Attewell et al. (2006) found that remedial lessons contribute to learning success for students who have not been adequately prepared for the study programme. This meaning was reflected in some of the participants' comments.

> *I felt there was lack of adequate content coverage or exposure to content during module orientation exercise at the university and this hampers field facilitation. (BLK-FF)*
>
> *Now it's like there [at satellite learning centre] we are given the second chance, more especially like for myself ... for example in calculus I had a problem but when I went there at least I was assisted quite a lot. (LL-FGI)*
>
> *Sometimes students demand actual teaching and not facilitation and we provide it as such. (LL-FF)*

Most students demand teaching the entire content but we only focus on areas where they seem not to understand. (FFWG, MZ-FF)

The above comments are indications that field facilitators have an idea what their role is which is that of facilitating or supporting student learning. However, due to the circumstances on the ground, they worked in quite different ways to meet the learning needs of the students and the overall object of enhancing learning and success. Although they used different approaches to support student learning, their approaches largely emphasised remediation and some focused on mere coaching and drilling students for examinations as will be discussed in Section 5.2.3 and later in Section 5.3 under the subject of the activity system. However, the differences in field facilitation approaches or strategies are challenges and would be potential sources of contradictions but at the same time a springboard for expansive transformation of the field facilitation activity system as will be discussed later in Chapter Six.

5.2.2 The students' progression and graduation goal

Students' progression and graduation goal are other goals contributing to the main object of enhancing learning and success. Although the other stakeholders such as the Malawi Government through the Ministry of Education would want more teachers to teach in secondary schools, the students' goal is quite immediate – progressing from one semester to another, one year of study to the other and eventually graduation. This end outcome would only be possible if there is learning and success in the learning process first. For example, one of the student respondents in the Mzuzu FGI said:

The field facilitators usually give us tips on how we can solve examination problems. (MZ-FGI)

One of the lecturers corroborated this but commented on the link between course lecturing and field facilitation and how the latter can assist students with preparing for examinations.

Also, you know by the end of the day a student is very concerned about an examination now the way you facilitate has an influence in the way you will assess, if there is no collaboration between the course coordinator or lecturer and this field facilitator and then they might use examples and the like which are quite parallel to what the course facilitator will focus on. (LP)

The above discussions suggest that the participants in the field facilitation activity system had immediate goals which motivated their work towards the object of student learning and success. It is, however, worth acknowledging that even though the above-mentioned actors had distinct goals or motives towards the object of this activity system, their actions seem disjointed and problematic in the attainment of the object of enhancing student learning and success. This is largely due to the absence of field facilitator and lecturer collaboration in the activity system as illustrated below.

> *There is a need for some sort of link or collaboration between the field facilitators and lecturers. (LP)*

All five of the field facilitators indicated in their interviews, in different words, that they had minimal collaboration with lecturers before or during the field facilitation sessions (MZ-FF, BLK-FF, MJ-FF, KA-FF & LL-FF). This signals the necessity for collaboration between the field facilitators and lecturers before the commencement of and during field facilitation activities for them to be successful. The absence of collaboration between field facilitators and lecturers would result in field facilitators not working as expected by the course lecturers. The same lecturer went further to indicate the need for continued engagement between the field facilitators and lecturers.

> *There is a need of periodic reports of what they (field facilitators) are doing so that the course facilitator (lecturer) can follow up with them, at least some sort of system of supervising these people. Because otherwise they may not approach the content as intended. (LP)*

Besides linkages or collaborations between field facilitators and lecturers, the need for field facilitator induction was also mentioned by lecturers and field facilitators.

> *I would think some sort of an orientation with the module facilitator would be useful. (LB)*
>
> *They (field facilitators) need to be trained on how to handle ODL students. (LM)*

The field facilitators all spoke of the lack of orientation by what they termed ‘content experts’ before they started working with students in the Satellite Learning Centres (MZ-FF, BLK-FF, MJ-FF, KA-FF & LL-FF).

Although different terms have been used here such as training, orientation and induction, according to this study, they mean an activity in which the lecturers prepare the field facilitators first before

they are engaged as field facilitators so that they work as expected by the lecturers and the university (Mzuni). The absence of collaboration between field facilitators and lecturers and field facilitator induction, training or orientation resulted in field facilitators doing field facilitation in uncoordinated or unstandardised ways, some of which would not enhance the object of enhancing learning and success.

5.3 The Subject

In any collective endeavour, there is a group of actors pursuing a common object. Actions are accomplished through a series of unconscious *operations* whose successful execution is dependent on the *conditions* that exist in the context in which the activity is carried out (Mwanza, 2002). In second-generation Activity Theory, the focus is on a key set of subjects, while acknowledging that they act within a community of actors (as discussed below) and that the actions of the subjects are always mediated by this community and indeed by all other components of the activity system.

The field facilitators are the subject of this study. The subject of any activity system is the main actor in the activity system. This means that the subject plays the key role(s) in directing action towards achieving the object(ive) of the activity system, which includes initiating activities (Schuh et al., 2018). In this activity system, typical activities would be initiating student group discussions, conducting remedial lessons, suggesting supplementary learning materials and preparation for assessment activities. This might not be an exhaustive list of roles played by the subject due to lack of standardisation of the roles of the field facilitators on field facilitation strategies, an issue I discuss later.

The field facilitators were Science and Mathematics secondary school teachers in Malawi. They were full-time employees in the MoEST. Field facilitation at Mzuni was their part-time work. The major requirement for the post of the field facilitator is a B.Ed with at least a credit pass (see Chapter One) and at least three years of work experience in teaching (D13). There is an assumption that field facilitators holding such characteristics would ably handle field facilitation sessions. However, questions of whether the field facilitators would be recognised as legitimate practitioners emerged as an issue in the data. For example, some remarks by the students signalled the possible

lack of legitimacy of the field facilitation activity system as evidenced by this remark made by the Balaka students' focus group interviewees.

> *Most field facilitators graduated long time ago and content wise they might not be familiar or they may have forgotten what they covered in the university. I think most of them are not capable to deliver content. (BLK-FGI)*

This was further remarked on by the Karonga students and the students in their CLW WhatsApp group.

> *Some of the field facilitators lacked content expertise. They (field facilitators) expect students to have more knowledge on the subject matter. The students expected field facilitation to have content expertise. … The field facilitator was supposed to teach first and explain in details at a later stage as the lesson advanced. The field facilitator felt that students know the content already and that the field facilitator should focus on only difficult ideas. (KA-FGI)*
>
> *Some field facilitators do not have the required content knowledge in respective courses hence their delivery is just based on fulfilling the hours allocated but not really helping students acquire the necessary skills and knowledge in various disciplines. (SWG)*

The other issue worth discussing that made field facilitators seem less legitimate was the way in which the field facilitators were recruited as illustrated.

> *We question the effectiveness of field facilitators as we are not sure whether the field facilitators identified by our fellow students could be of required quality and competencies. (MJ-FGI)*

It is not clear whether the selection of field facilitators by student cluster leaders demonstrates democracy and a practice of empowering students in decision-making processes in an institution where power relations and influence are hierarchical and there are concerns about a lack of student-centredness (Oleksiyenko & Ruan, 2019). Heads of academic departments lead the academic staff recruitment process (D2), but the recruitment of field facilitators is left to students. The data suggests that this is less an example of student empowerment than an indication that the field facilitation activity system as a whole is not accorded sufficient value by the university. Students in two of the focus groups commented on this.

The university should lead which means the university will look for good quality facilitators who can do the job well. (KA-FGI)

Leaving the role of field facilitator identification in the hands of the students would result in the field facilitators not to take field facilitation seriously. … Some students are demotivated by the way field facilitators are identified. They question the effectiveness of the activity as they might not be sure whether the field facilitators identified by fellow students could be of required quality and competencies to handle field facilitation. The field facilitator recruitment process should be well formalised so that the university finds quality field facilitators. (MJ-FGI)

In spite of these tensions, the field facilitators are generally considered to be valued subjects in the ODL space, with the literature indicating the value of using field facilitation for scaffolding student learning in situations where independent study is a challenge (see Mackiewicz & Thompson, 2014). At Mzuni, the field facilitators have legitimacy as subjects of this activity system through the ODL Steering Committee recommendations (see Chapter One) leading to the mandate from university management. In some of the data, comments from the students indicated that the role of field facilitators was legitimate and important.

Field facilitation promoted student learning by enabling longer engagement time with the content as well as breaking the large university classes into manageable smaller groupings of students. These smaller groups seemed to enhance the quality of students' learning.

We actually interact with field facilitators... things that we cannot do here (on campus), and it also helps us have enough practice on the problems and the content. (BLK-FGI)

Since we were few than we were in the class here on campus … there (at the satellite learning centre) we were able to interact with the facilitators we were assisted maybe individually and we were also free to ask questions. (MZ-FGI)

Therefore, field facilitation enabled depth and scope in terms of curriculum coverage. As earlier discussed, (see Chapter One) the module orientation exercise is aimed at introducing the students to the semester course content without necessarily covering the course content in detail. The field facilitation sessions which happen during the distance phase of the semester give the students an opportunity to cover the semester content in detail.

When we are here (on campus), we just cover sketchy content and when we go there (Satellite Learning Centres), we have at least chance to cover topics in detail that we don't cover here (on campus) ... now it's like we are given the second chance. (LL-FGI)

Yet despite field facilitation being valued by the lecturers and students as useful, there were concerns raised about levels of continued engagement. Engagement with field facilitation activity seems to have faded as the students progressed to higher years of study at Mzuni. However, the field facilitators seemed to feel that this was due to students leaving their study programme or students finding ways to cope on their own. For example, the Balaka Field Facilitator said:

There were high attendance levels in years 1 and 2. Attendance dropped as they progressed. (BLK-FF)

In agreement with this, the Karonga and Mzuzu field facilitators also remarked:

Uncertainty and pressure at years 1 and 2 could be the cause for good attendance at field facilitation sessions. (KA-FF)

But as they progress to higher years, they had a view they could cope. (MZ-FF)

On the same note, Lilongwe and Mulanje field facilitators said:

Dropping of challenging courses and concentration on what was manageable to them was another cause. (LL-FF)

They found no need for extra help. (MJ-FF)

From my experience, most students attend field facilitation as one way of adapting to the demands of university education. As they progress to year 2, student attendance drops. From this I suggest that field facilitation might have helped them gain some survival skills thereby gaining confidence to study on their own. (FFWG)

High attendance levels at field facilitation sessions in year one is an indication of how critical the first year is for student retention and throughput in universities, particularly at Mzuni. Year one is a transition year from secondary school to the university. Besides that, in the case of ODL students at Mzuni and probably elsewhere, year one marks the transition from the traditional f2f mode of learning to the novel ODL mode of learning. Field facilitation as a strategy to enhance learning

and success would therefore be valuable to students at this point of study. However, there were contrary views as shown by one of the field facilitators that the reduction in attendance may have been attributed to students seeing no value in the activity as illustrated below.

> *Students saw no value for money in field facilitation. Students thought the module orientation and the access to the module itself was enough for them to understand and learn on their own. (MZ-FF)*

However, considering the fact that this came from the field facilitator who was not the key target and beneficiary as far as field facilitation is concerned, it would still be necessary to inquire further on the activity system.

On a related note, the field facilitators questioned the quality of candidates admitted into the ODL B.Ed Science programme. In their interviews, all of the field facilitators commented on, for example, the lack of necessary or required prerequisites for the programme, the 'calibre' of the students in terms of being able to cope with the course content and their grades coming into studying the sciences at Mzuni (BLK-FF, KA-FF, MJ-FF, LL-FF & MZ-FF).

In addition, another field facilitator from Mulanje Satellite Learning Centre remarked:

> *I am not comfortable with the recruitment criteria of students, some students haven taken too long in the field before being admitted to the university [such students had challenges grasping the content, lacked prerequisite skills and knowledge]. (MJ-FF)*

The above is a secondary contradiction between the field facilitators, the subject, and the student recruitment (admission) policy of Mzuni which further contradicts the Malawi Government policy of increasing and broadening access to higher education (the rules). The Mzuni admission policy consistent with ODL policy is, to a greater extent, open, which does not restrict admission based on when the entry qualification into the university was obtained. However, this results in admitting students who may have outdated prerequisites (knowledge and skills) for university education which would be a challenge to student learning and success.

There are two recruitments that were mentioned. The field facilitator recruitment and student recruitment. The subject (field facilitator) faults the student recruitment (admission) criteria into the ODL B.Ed Science programme while the students, part of the community (to be unpacked

later), faults the field facilitator recruitment (employment) criteria. The issue of field facilitator recruitment will of course be fully unpacked under rules and division of labour of this activity system. However, as one of the issues that challenges the legitimacy of the field facilitation activity system, it is necessary to mention it here.

The above discussions therefore reveal contradictions that exist on whether or not the field facilitation is a valuable practice. This is the secondary contradiction between the students (part of community) and field facilitators (subject). Although students and field facilitators value field facilitation practice as a worthwhile or valuable thing, the way it is operationalised at Mzuni makes it ineffective and inefficient and consequently less valuable. These contradictions point to the systemic issues which were not addressed prior to the implementation of the field facilitation activity which would have resolved some of these issues. For example, the issue of field facilitators not engaging with lecturers so that they are acquainted with what the university (Mzuni) and the ODL students would expect from them as discussed in Section 5.2.4.

The other problem arose from the way field facilitators are paid. Both the students responsible for recruitment and the field facilitators commented on this.

> *However, the challenge is that we cannot retain them (field facilitators) for at least two semesters or sessions. They usually facilitate for only one semester or session and the next session they are not available. This probably is due to being dissatisfied with the payment. ... Their payment is not negotiated with field facilitators, and it seems the field facilitators are not satisfied and this does not attract field facilitators to do the work.... Sometimes there is a problem of field facilitators being engaged on temporary basis. We can have someone competent but could only facilitate for a semester or two and they easily get scholarships to study abroad or could even be transferred to other institutions and we do not have any control on them. (MJ-FGI)*
>
> *Delayed payment of field facilitators demotivates some of us. (FFWG)*
>
> *Facilitation allowance is on the lower side. (FFWG)*

This signals the secondary contradiction between the expectations of the field facilitators (subject) and the Mzuni management (community) which has been revealed from the data as captioned

above. The Mzuni management team expects field facilitators to work towards the enhancement of learning experiences of the ODL Science and Mathematics students (object) with an expected outcome of enhancing retention and throughput which would be a challenge when the field facilitators are discontent with payment.

5.4 The Community

The community refers to the people who share the common object. Engeström (2016) sees a community as the carrier or bearer of activity. The community is defined and bounded by its concrete historical form of the given activity system. The role of the community in an activity system is to collaboratively work on the object (ive). Each member of the community has a role to play towards the achievement of the object (ive) and desired outcome. Each member or group, though, must work together to achieve this outcome, which means they need to coordinate their roles and efforts effectively. For example, the lecturers design and develop the instructional materials called modules and they use these modules as guides for course orientation to students during the f2f (on-campus) block. The field facilitators thereafter use these modules for supporting students' learning. The distribution of the roles among the community members in the field facilitation activity system means that the attainment of the object of the field facilitation activity system is not the responsibility of a single individual.

The community in this study context was a group of local stakeholders who participated in the field facilitation activity either explicitly or implicitly. Those who acted and participated explicitly in the community of the field facilitation activity system were the students and field facilitators while the lecturers, ODL staff and university leadership (University Registrar, Vice Chancellor and the Deputy Vice Chancellor) acted and participated implicitly. The participation of students and field facilitators in the activity system was explicit because their roles were clearly spelt out in the data, and they directly engaged with each other in the activity (D5; D12; D13), while that of the ODL staff and university leadership was not clearly spelt out and was indirect, despite the support that the university provided to lecturers to support student learning during the distance phase of the semester (D5).

Continuing my discussion on the community in the activity system, I now turn to field facilitator (subject and part of community) and lecturer (part of community) engagement. As shown in the data that follows, there is an indication that lecturers supported student learning even during the distance phase of the semester where field facilitation is scheduled. This is supported by the university management according to the ODL policy (D4). The field facilitators did not see themselves doing what the lecturers expect them to be doing. For example, one of the students said:

> *We are given practice questions in mathematics to do while home. (LL-FGI)*
>
> *Researcher: Have they (practice questions) been helpful?*
>
> *Yes, we did this with the help of field facilitators. Like for example we are given an example like that in chemistry because it was a little bit difficult what a lecturer did was to give us a lot of questions saying that some of the questions on the continuous assessment will come from these questions but may be just slightly twisted. That gave us energy to say that okay we have to read and to understand these questions so that we are able to answer on our own. (LL-FGI)*

The above data signal the contradictions that exist within the students that result from the conflicting expectations and roles of the field facilitators and lecturers.

As mentioned earlier, another contradiction resides in the expectations on the part of the community (students, lecturers and field facilitators), that although the common object of the activity system is enhanced learning experiences of ODL students in Science and Mathematics towards the expected outcome of retention and throughput, the way this part of the community acts towards the object is not the same. While the lecturers and field facilitators expect the students to be independent learners, students expect to be taught. This is a contradiction to the popular ODL pedagogy as shown in Chapter Two (see Table 2.2) which does not favour physical human presence. However, as theorised by CHAT, participants in activity systems are historical social beings (Engeström & Sannino, 2021). Therefore, the students, field facilitators and lecturers bring their personal histories and culture into the activity which is a potential source of contradiction in the ODL setup as shown below.

One reason might be that since these students are just joining college from secondary School, they would want to have the module content re-taught so as to build confidence as they prepare for the very first exams at college. (FFWG)

Although each community is made up of a number of members and achieving the shared object(ive) is the responsibility of all members, each member plays distinct roles, referred to as a *division of labour.*

5.5 Division of Labour

Division of labour refers to both the horizontal actions and interactions among the members of the community and to the vertical division of power, resources and status related to the transformation process of the object into the outcome of labour (Engeström, 2001). As a reminder, the participants within the community of this activity system include students, lecturers, staff in the ODL Centre and Mzuni top leadership while the field facilitators are the subject in the activity system. The students themselves are diversified in terms of their characteristics and roles, of which the latter are of particular importance in the context of division of labour. For example, some students play leadership roles such as cluster leadership where they are responsible for leading field facilitation activities at the Satellite Learning Centres (D5; D12). Cluster leaders are appointed by fellow students at the Satellite Learning Centres. The rest of the students play learning roles in their capacity as individual learners or in relation to their peers. The field facilitators play field facilitation roles, similar to tutoring (see Chapter One). Their roles include drilling and teaching using a variety of strategies. Drilling entails the support the field facilitators provide to students during field facilitation sessions which are aimed at equipping students with skills and strategies on how to tackle and answer examination questions. For example, one of the student respondents in the Mzuzu students' FGI said:

The field facilitators usually give us tips on how we can solve examination problems. (MZ-FGI)

The coaching is mostly field facilitator-centred despite being initiated at times and requested by the students. This is probably due to the field facilitators' lack of confidence on how they could conduct the coaching as they were not inducted into field facilitation as acknowledged by one of the lecturer interviewees. The lecturer interviewees recommended field facilitator induction by the

course lecturers who teach the courses at the university as this would guide the field facilitators to do their work well (LM, LP, LB & LC). The absence of field facilitator induction by the course lecturers could result in role confusion as the roles of field facilitators and lecturers would easily be mixed up.

> *There is no training on how to use the modules to field facilitators. Some field facilitators believe that by doing it page by page they are assisting students more as compared to presenting only critical areas of the module. They don't believe that students can learn other units of the module on their own. (FFWG)*

> *One way would be to ensure that ODL students are fully oriented on the ODL mode of content delivery. They are open and distance learners who spend few weeks on campus doing face-to-face orientation to the modules and the rest is done on their own at home or workplaces. Support is provided at a distance, and they have to fully utilise the face-to-face session, though short by allowing facilitators to focus on areas that they have challenges. (FFWG)*

This therefore points to the need for field facilitator induction before being engaged by the university so that the field facilitators know exactly what their roles are as expected by the university. This entails clear division of labour between, in the first instance, lecturers and field facilitators, where the lecturers teach the materials and the field facilitators then coach students on aspects of areas of the work they do not understand or need additional help with. But this is not what is happening; partly because students have expectations from prior learning experiences that facilitators will teach the materials, and partly because field facilitators are not trained and supported in pedagogies of tutoring and facilitation. This may leave field facilitators without any choice but to revert to teaching the materials or going 'page by page' as they had done before. This, then, is a contradiction that will be unpacked in the next chapter (Chapter Six).

However, although the field facilitators are not formally inducted on how field facilitation is supposed to be done, there is some evidence of awareness of appropriate pedagogical practices in an ODL learning environment which the students would benefit from – this could be due to prior field facilitator formal training as secondary school teachers. For example, one of the student respondents from the Mulanje student FGI said:

They look at the content and match with given time so they choose methods which will enable them cover as much content as possible within the limited time provided. (MJ-FGI)

This acknowledgement by one of the students who attended field facilitation sessions indicated that despite the absence of formal field facilitator induction, the field facilitators were able to work responsively and situationally. They were able to use the field facilitation technique suited to the available time. This is the field facilitators' knowledge which the university could build on and benefit from in the induction process of the field facilitators.

Besides teaching (both student-centred and field facilitator-centred, depending on the strategy being used and available time), field facilitators also played an assessment role as remarked by one of the student respondents in the Lilongwe student FGI who said:

Sometimes the field facilitator would give us home assignment, then after doing home assignment he would communicate we have these problems and would help us address those problems. (LL-FGI)

This was formative assessment which was aimed at checking whether or not the students were learning. Mostly, such assessments were in the form of individual or group assignments. For example, one of the student respondents from the Mzuzu student FGI said:

After a lesson the field facilitator gave us work which we did both as individuals or in groups so that he could see whether we understood or not. (MZ-FGI)

Individual assignments were usually done at students' homes while group assignments were either done at home or at the satellite learning centre, depending on the nature of the task. Such assessments were worked on informally by field facilitators and students without the input of the lecturer. For example, one of the lecturer interviewees said:

A student is very much concerned about an examination. The way you facilitate has an implication in the way you will assess, if there is no collaboration between the lecturer and the field facilitator and then they [field facilitators] might use examples which are quite parallel to what the lecturer will focus on. (LP)

This suggests the need for the lecturers and the field facilitators to have a clearly articulated understanding of the division of labour between them and how they should work in a complementary way to achieve the object of the activity system. This therefore suggests collaborative efforts between lecturers and field facilitators in the planning of assessment tasks for the distance phase of the semester. This would mean coming up with relevant assessments which would be accepted by the lecturers and enhance student learning.

The other critical role played by the lecturers which is part and parcel of field facilitation is module orientation (see Chapter One). Module orientation serves as a foundation for students' course work. This is done on campus. However, there is a possibility of a contradiction between the roles of the lecturers and field facilitators since both use the same module for supporting student learning during module orientation and field facilitation.

On top of that, the field facilitators are not inducted on how to do the field facilitation. This means chances are high that field facilitation is not happening in all the ways intended by the lecturers as earlier stated. The ODL students are generally regarded as mature students capable of managing their own learning. With this assumption, field facilitation is left in the hands of the students and their field facilitators. However, data showed that not all of them were really ready for self-regulated learning. For example, the Lilongwe field facilitator remarked that the

> *[c]alibre of students that we handle is a challenge. Most of them are behind in terms of ODL learning. (LL-FF)*

All this points to an unclear division of labour in terms of the extent of preparedness of the students compared to what the field facilitators are meant to be doing. Although the students are adults who are assumed to be able to manage their own learning, their knowledge and study skills in the ODL environment might be a challenge. What adds to this challenge is their study background as these students come from secondary schools where the mode of delivery of lessons is f2f. Some students seem unprepared, but overall, the facilitators feel that they are meant to be facilitating learning whereas actually the students are underprepared. It is a challenge as the students cannot cope with the ODL situation and so it becomes almost impossible for the field facilitators to cope with the remedial nature of the kind of pedagogy that is needed.

In a nutshell, the key findings on this component of the field facilitation activity system are twofold. First, the field facilitators are unclear as to whether their job is to re-teach the content i.e., to provide remedial support to students who have not managed to grasp what has been introduced or oriented on campus; therefore, the division of labour between the field facilitators and the lecturers is very blurred and this is a clear contradiction in the activity system. The field facilitators themselves seem unclear about what their part of the job is compared to the lecturers and vice versa. Second, there is a problem around the division of labour which is a tension between what the field facilitators expect of the students and the diversity or range of what the students are actually able to do. The field facilitators expect the students to have already engaged with the course content and to bring specific higher order questions to them, whereas in other cases, they have students that need actual remedial support and re-teaching of the course content. Within this tension, as discussed under the section on community, the problem emerges that some students do not want remedial support and in fact find the field facilitation sessions boring and a waste of time; therefore, the division of labour in terms of what the students are meant to bring to the sessions and what their roles are compared to what the field facilitators are meant to do is also blurred.

A lack of explicit articulation of rules and regulations guiding field facilitation sessions (to be discussed in Section 5.6) resulted in problems on division of labour in the field facilitation activity. It was not made explicit on who (lecturers, field facilitators or students themselves) and how the students should be prepared before they reported for field facilitation sessions. Critical though in the study of the field facilitation activity system is the absence of university leadership such as the deans of faculty, heads of departments, the University Registrar and the vice chancellor. Their presence would have impacted the field facilitation activity system since these offices might have influenced ODL policy in general (to be unpacked in Chapter Seven).

Having discussed the division of labour in the field facilitation activity system, I move to the rules of the activity system. As discussed earlier, division of labour entails members of the community in the activity system playing distinct roles which are aimed at a particular object. However, for such roles to be smoothly executed, there is a need for regulating mechanisms that will ensure that the roles are executed as intended. Such regulating mechanisms are the rules which will be discussed in the following section.

5.6 The Rules

Rules refer to explicit and implicit norms, conventions and social relations within a community (Engeström, 1987). These rules could be both formal and informal and they enhance and constrain accomplishments and development of an activity system. Rules mediate relationships between subject and community and shape participation in the activity (Benson et al., 2008). Assessment, progression, field facilitation contract collaboration, field facilitation attendance rules and field facilitator employment rules (D9–D13) are some of the rules that guide the activities of the field facilitation activity system. Rules are both explicit as well as implicit. Explicit rules are more direct and straightforward in guiding what happens in the activity system while implicit rules are just thought or assumed (Jakobsson, 2020). In the field facilitation activity system, explicit rules are found in documents D5–D11 (Chapter Four, Table 4.4.). This is the case because such documents clearly inform the field facilitation practice as shown in the sections that follow. There are also implicit rules in this activity system. These rules are in documents D1–D4. This is because the university just assumes that the community in the activity system understands what is expected from them by virtue of their unquestioning participation in the field facilitation activity. Such implicit rules in the field facilitation practice emerge through use of language in some of the documents (D1; D2) which is legal and beyond understanding of the lay person and endorsement by the powerful people in the university system and the senior management of the university who do not acknowledge the ODL problems at the expense of proper ODL governance and growth (D1; D2).

5.6.1 Field facilitator employment rules

The choosing of the field facilitators is done under the leadership of the students' cluster leader in a particular satellite learning centre (Mzuni Field Facilitator Contract, 2014) (D10). However, as discussed earlier (see Section 5.3), the question that needs to be asked is whether this is a sign of democracy in an academic institution whose culture is hierarchical and signifies student empowerment, or whether this signifies the lack of concern about the field facilitation activity system by the general management of the institution and the academics. As I indicated earlier, based on this study's data, one would tend to think that leaving the responsibility of identifying field facilitators in the hands of students is a sign of little value attached to ODL programmes by the university.

After the field facilitators are identified, they complete field facilitation contract collaboration forms which specify conditions of service for the field facilitator. Copies of certificates and curriculum vitae for the prospective field facilitators are attached to the forms and sent to the university (ODL Centre). These are endorsed by ODL administrators before being approved by the University Registrar. After approval by the registrar, the field facilitators are then engaged by the university.

As discussed in the opening paragraph of this chapter, the field facilitators are contractual employees of Mzuni. They are engaged by the university on a fixed-term contract. The contract is valid for a semester of an academic year but can be negotiated for extension for another semester upon recommendation by the students of the particular satellite learning centre (ODL Field Facilitation Collaboration Contract, 2014) (D10). It should also be noted that the students are mandated to identify their own field facilitators (D10) which is not in favour of students as one of the students in the Balaka student FGI said:

> *The university should lead in the identification of field facilitators which means the university will look for good quality facilitators who can do the job well. (BLK-FGI)*

The practice of giving the students autonomy to identify the field facilitators raises a lot of concerns among students, field facilitators and lecturers which mostly hinge on the quality of the field facilitators that are identified.

5.6.2 Assessment rules

Field facilitators engage students in assessment activities, although informally as indicated earlier. They are informal because the course owners (the lecturers) do not endorse them, nor do they contribute to the end-of-semester grade at the university (D5). However, they are critical to enhancing student learning as students are able to evaluate their own learning. According to one of the student respondents in the Lilongwe student FGI:

> *Here on campus, we have little time while there in Satellite Learning Centres we have 'ample time'. Here it's limited. Sometimes you keep questions just as a matter of time but there at the satellite learning centre you have a lot of time and ask whatever questions. (LL-FGI)*

The phrase ‘ample time’ might be misleading. It raises questions which need to be addressed such as ‘ample time’ for what? This question would address qualitative aspects of field facilitation rather than just looking at the quantitative aspects of time available for field facilitation (the entire distance phase of the semester). Students might easily be misled by the length of the distance phase of the semester (quantitative aspect) without looking at what is done during field facilitation within the distance phase of the semester (qualitative aspect). Furthermore, the absence of field facilitator induction may leave the field facilitators without guidelines on how the formative assessments are supposed to be done. This would mean no standard way of conducting such assessments as field facilitators would do it depending on the prevailing conditions in a particular satellite learning centre and on how they were trained themselves.

> *If our students have mastered integration techniques already in mathematics, the field facilitator would focus on physics part of it. The integration techniques ought to be prerequisites for the physics.… This necessitates the need for students to be assessed prior to teaching them the required content. (LWG)*

The above illustrations suggest the need for student assessment prior to admitting them into the course of study (diagnostic assessment). Palmer et al. (2018) found that diagnostic assessments are critical for student retention and throughput in the first year of study. Pinxten et al. (2019) agree by arguing that the open admission policies in the current era of widening access to higher education results in admitting heterogeneous student groupings which calls for proper diagnostic assessments prior to admitting them into an academic programme.

5.6.3 Field facilitation contract collaboration rules

As a practice regulator, field facilitation contract collaboration rules (D10) lay out the way field facilitation should be done. Ideally, ODL lecturers and students are supposed to agree on areas of focus during field facilitation as indicated in D5, “in consultation with Open and Distance Learning students, lecturers are to plan for Science and Mathematics tutorials in areas of concern” which is not done. For example, the Mulanje field facilitator said:

> *We would have loved if there were advance preparations for field facilitation sessions in the Satellite Learning Centres by the students. (MJ-FF)*

This would have aided the field facilitators to focus only on those areas recommended by the lecturers for more learning support. The field facilitation contract collaboration only stipulates the maximum duration of the field facilitation sessions which indicates that they should run for a maximum of 16 hours per course in a semester (D10); this number is determined by the ODL Centre (D12). How the 16 hours are spread across the entire distance phase of the semester is jointly agreed upon by the students and the field facilitator.

For example, the Mzuzu field facilitator said:

> *Students would request to arrange with me to have a block for two weeks continuous and squeeze all the content within this time. (MZ-FF)*

Although the field facilitation collaboration contract is silent on how the 16 hours should be spread, the continuous block of 16 hours within two weeks would exclude other students from participating. For example, as indicated earlier, the ODL student community is a diverse student community in terms of gender, residence and work status. Having a continuous block of 16 hours within a week would disadvantage employed students. On the side of the field facilitator, this would have lacked consistency as this depended on the availability of the field facilitator. It worked because the field facilitator was available during this particular time.

Practically, 16 hours has proved inadequate for field facilitation for the entire distance phase of the semester as remarked by one of the field facilitators from Mulanje Satellite Learning Centre.

> *Timing was limited. Increasing meeting time and a variety of resources would be helpful such as using video-recorded resources, video conferencing etc! (MJ-FF)*

The designing of the field facilitation activities did not take into consideration the affordances of the available and emerging ICT technologies which would better support field facilitation, hence limiting the efficiency of the activities. Limiting the time for interaction between field facilitators and students further limited other students who would require more time on the learning tasks. It also limited the students who might not be able to attend f2f field facilitation sessions due to other commitments and challenges such as work and finances. In addition, the contract did not clarify how the field facilitation activities outside the 16 hours of f2f meetings and virtual interactions

would be compensated. The contract simply stated: *Mzuzu University undertakes to compensate the field facilitator for one hour per subject he/she facilitates in a week* (D10). As pointed out earlier, field facilitation takes place in the distance phase of the semester which is 16 weeks, hence the recognition of 16 hours compensation of f2f physical meetings between students and field facilitators. However, there is evidence that at times, field facilitation time goes beyond 16 hours which is informally arranged between the field facilitators and the students, and this excess time is neither documented nor paid for (D10). The official contact hours are documented on a field facilitator attendance form (D11) which is submitted to the ODL Centre to initiate the field facilitator payment process. Many of these points have already been touched on in this chapter in relation to other components of the activity system. This is not unexpected given the ways in which the activity system does not comprise separate components but rather works sometimes as a complementary and sometimes as a contradictory whole.

5.7 The Tools

Thus far in this chapter I have endeavoured to outline what the data illustrates about each component of the field facilitation activity system. In this final subsection I will discuss the tools. In Activity Theory terms, an instrument or tool is anything used in the transformation process to achieve goals and they include both material and non-material (e.g., mental capability, artefacts, etc.). Engeström (2016) argues that instruments, tools and artefacts mediate the relationship between subject and object. This is further supported by Mwanza (2001) who looks at tools as the means used by the subjects in carrying out the activity. In the field facilitation activity system at Mzuni, there are a variety of tools which are used. For the sake of this study, I categorised the tools as curriculum tools, communication tools, assessment tools and practice regulation tools. I also categorised the tools as explicit as well as implicit as earlier done with the rules guiding the field facilitation activity system.

The explicit tools are the clear and straight forward tools while the implicit tools are the assumed or thought tools (Jakobsson, 2020). Of the tools presented here, the curriculum, communication, assessment and practice regulation tools are implicit in as far as field facilitation is concerned because it is assumed that by virtue of the field facilitators being Science and Mathematics education graduates, they would be able to support the learning of Science and Mathematics among

ODL students using available and appropriate tools. This assumption proved wrong as evidence from the data showed that field facilitator induction and field facilitator/lecturer collaboration was necessary for an effective and efficient use of tools. However, the major departure from the tools being implicit to being explicit was seen in practice regulation tools, particularly those that were direct to field facilitation management. This was the case because such tools such as field facilitation contract forms and field facilitator attendance forms were clearly explained to them and there were the sole users of the tools (students and field facilitators), unlike the other tools earlier discussed.

The following are used as communication tools during field facilitation activities in the distance phase of the ODL semester. These include cellphones which make use of the following applications SMS, phone calls, WhatsApp and emailing (D6). As communication tools, they were mainly used for information sharing on important field facilitation related activities among students and field facilitators. WhatsApp and emailing work on web enabled phones while SMS and phone calls work on ordinary phones only. Table 5.1 below provides the summary of survey statistics in which it is shown that ICT tools were not significantly used to aid student learning.

Table 5.1: Summary of survey data showing ICT usage in the distance phase of the semester

Questionnaire item	Attribute	Frequency
Nature of ODL students in terms of location	Rural/urban students' distribution	40 respondents out of the total 65 respondents indicated that they stayed in rural areas
Average frequently used means of interaction among students and between students and field facilitators	Phone calls	40 respondents of the total 65 respondents indicated that they used the phones for making calls
Key source(s) of academic information during the distance phase of the semester	Instructional modules	60 of the total 65 respondents indicated that they used the module as a key source of academic information

ICT tool(s) least accessible by students during the distance phase of the semester	Web enabled phones	10 of the total 65 respondents indicated that they had access to ICT tools during the distance phase of the semester (Remember field facilitation takes place during the distance phase of the semester)
ICT facility accessibility by students during distance phase	No accessibility	45 respondents of the total 65 respondents indicated that they had no access to ICT tools during the distance phase of the semester (Remember field facilitation takes place during the distance phase of the semester)
Internet accessibility by students during distance phase of the semester	No accessibility	40 respondents of the total 65 respondents indicated that they had no access to Internet during the distance phase of the semester (Remember field facilitation takes place during the distance phase of the semester)
Most frequent use for Internet during distance phase of the semester	Searching for reference materials and accessing assessment results	40 respondents of the total 65 respondents indicated that they used the Internet for searching for reference materials and accessing assessment results

Looking at the survey statistics (Table 5.1), the majority of ODL students do not have access to web enabled phones which made their communication tools limited for learning purposes. On the other hand, even those who had the required communication tools used them in a limited way because of the telecommunications infrastructural challenges in Malawi (National Statistics Office, 2018).

As mentioned earlier in this section, there were no proper guidelines on the usage of ICT tools in field facilitation activities. It was not explicitly mentioned what tools were supposed to be used during the field facilitation process. The use of ICT tools was just an informal arrangement agreed among the students themselves and sometimes between the students and field facilitators or lectures. For example, one of the students in the Mzuzu Students Focus Group Interview remarked:

> *We do a lot of calculations in sciences. So, we can calculate on paper and shoot a video as one calculates and share the video via WhatsApp... so we are able to see how they went about solving the problem because there is that element of a video. (MZ-FGI)*

The video-recorded materials, which were shared virtually on WhatsApp, enabled individualised student learning. Students could individually learn from the video content shared on WhatsApp either at their homes or in their workplaces at their convenient times and pace.

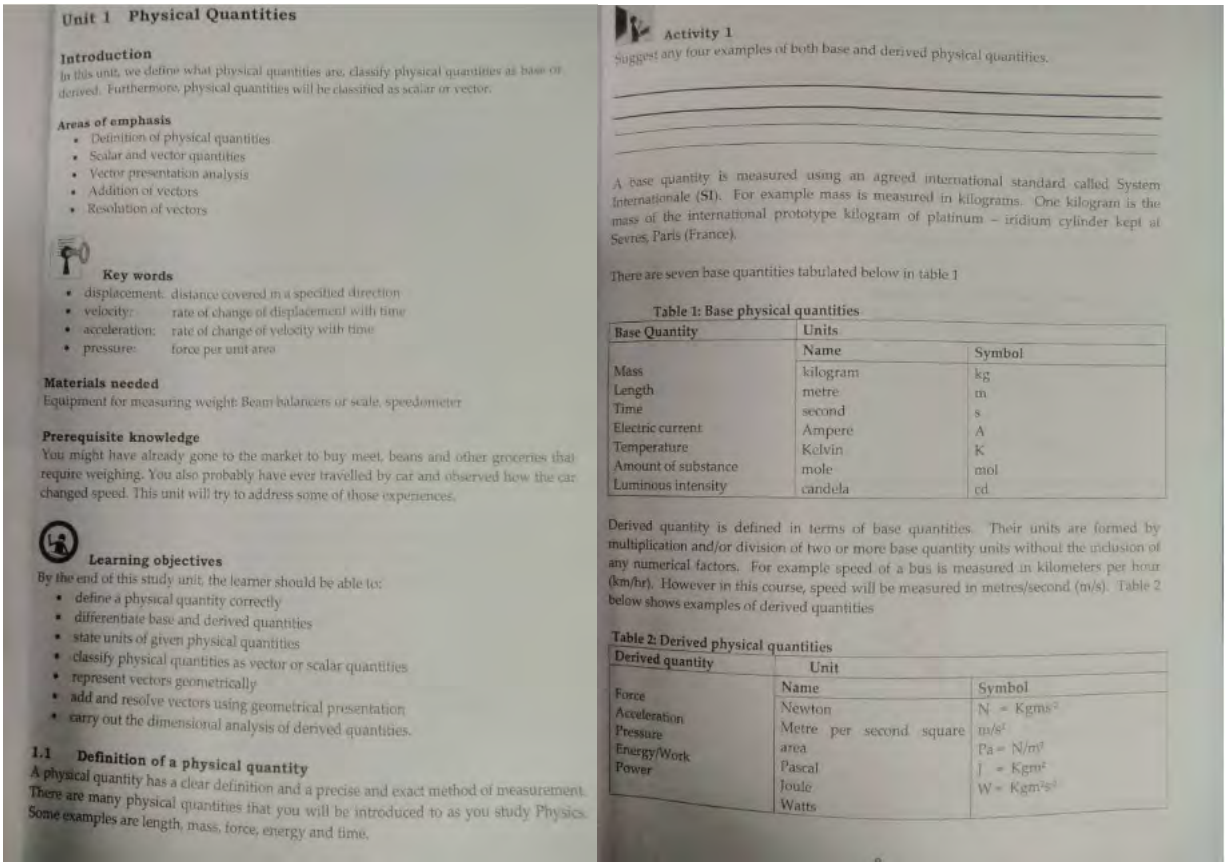
Many people working in ODL around the world might assume a high level of technological infusion in the pedagogical practices (Rambe & Mawere, 2011). However, given the low access to hardware and bandwidth in Malawi it was unsurprising that the data showed that where technology was used it was at a simple, low bandwidth level. In particular, the value of WhatsApp for instant communication in groups as well as for the sharing of short educational videos sometimes made by the students and field facilitators themselves should not be overemphasized. The low cost of sharing such videos was a major factor in the prevalence of WhatsApp as an educational tool in this field facilitation activity system (Mwanda, 2022).

5.7.1 Curriculum tools

These include instructional modules, handouts, textbooks, computer software and course outlines. The instructional modules which are specifically developed to support student learning are categorised according to the semester and year of study. In some cases, where there is too much course content for a semester, the course content might be split into two modules to make the course manageable to student learning (D7). The instructional modules usually in print act as the guide to field facilitators during the field facilitation sessions (D8). The instructional modules are the locally written teaching and learning notes reflecting the course outlines. They are written by the course lecturers and peer reviewed by other course experts within the field preferably from other institutions as a quality check mechanism. The instructional module guides both students' self-regulated learning and field facilitation when it is written following the course outline and instructional design principles (Commonwealth of Learning, 2005).

In most cases, the instructional module does not reflect the course outline fully. In such cases, the course outline (D7) becomes handy in guiding the field facilitation activity. In cases where the instructional module is not available, handouts and some textbooks are used to aid student learning. It is during this time the course outline is required. Handouts and textbooks are used with the recommendation of the lecturer responsible. In this case, the course outline works as a guide to the

field facilitator and the students during the field facilitation sessions because this is what the students carry with them to the satellite learning centre. However, the challenge is that the non-availability of the instructional module is not self-regulated learning friendly as the handouts and textbooks are not packaged or developed the way instructional modules are written. The instructional modules are written in such a way that they are interactive and support self-regulated learning (D8) (see Figure 5.2 below).



Unit 1 Physical Quantities

Introduction

In this unit, we define what physical quantities are, classify physical quantities as base or derived. Furthermore, physical quantities will be classified as scalar or vector.

Areas of emphasis

- Definition of physical quantities
- Scalar and vector quantities
- Vector presentation analysis
- Addition of vectors
- Resolution of vectors

Key words

- displacement: distance covered in a specified direction
- velocity: rate of change of displacement with time
- acceleration: rate of change of velocity with time
- pressure: force per unit area

Materials needed

Equipment for measuring weight: Beam balancers or scale, speedometer

Prerequisite knowledge

You might have already gone to the market to buy meet, beans and other groceries that require weighing. You also probably have ever travelled by car and observed how the car changed speed. This unit will try to address some of those experiences.

Learning objectives

By the end of this study unit, the learner should be able to:

- define a physical quantity correctly
- differentiate base and derived quantities
- state units of given physical quantities
- classify physical quantities as vector or scalar quantities
- represent vectors geometrically
- add and resolve vectors using geometrical presentation
- carry out the dimensional analysis of derived quantities.

1.1 Definition of a physical quantity

A physical quantity has a clear definition and a precise and exact method of measurement. There are many physical quantities that you will be introduced to as you study Physics. Some examples are length, mass, force, energy and time.

Activity 1

Suggest any four examples of both base and derived physical quantities.

A base quantity is measured using an agreed international standard called System Internationale (SI). For example mass is measured in kilograms. One kilogram is the mass of the international prototype kilogram of platinum – iridium cylinder kept at Sevres, Paris (France).

There are seven base quantities tabulated below in table 1

Table 1: Base physical quantities

Base Quantity	Units	
	Name	Symbol
Mass	kilogram	kg
Length	metre	m
Time	second	s
Electric current	Ampere	A
Temperature	Kelvin	K
Amount of substance	mole	mol
Luminous intensity	candela	cd

Derived quantity is defined in terms of base quantities. Their units are formed by multiplication and/or division of two or more base quantity units without the inclusion of any numerical factors. For example speed of a bus is measured in kilometers per hour (km/hr). However in this course, speed will be measured in metres/second (m/s). Table 2 below shows examples of derived quantities

Table 2: Derived physical quantities

Derived quantity	Unit	
	Name	Symbol
Force	Newton	N = $Kgms^{-2}$
Acceleration	Metre per second square	m/s^2
Pressure	area	$Pa = N/m^2$
Energy/Work	Pascal	J = Kgm^2
Power	Joule	W = Kgm^2s^{-3}
	Watts	

Figure 5.2: Two pages in an instructional module showing student content interactivity

However, remarks by some of the field facilitators show that the materials were not interactive enough.

> *There is also need to improve on how the modules are written. Make them simple or interactive for them to be self-explanatory. (LL-FF & MJ-FF)*

Some topics are not arranged in chronological order. For example, field facilitators have to go through some topics in mathematics before tackling other topics in physics or chemistry. (FFWG)

While the content of ODL materials is often quite similar to that of textbooks, ODL materials should place much more emphasis on the process of learning given the extent of self-management involved in the learning process (Commonwealth of Learning, 2005). The Commonwealth of Learning (2005, p. 4) suggests that the four things that would be most noticeable with respect to enabling self-regulated learning in an ODL instructional module would be:

- The wide range of learning devices;
- the relatively low proportion of text compared to learning devices;
- the space that is often provided for learners to write their answers in; and
- the 'generous' layout overall.

All these have been reflected in some of the ODL instructional modules of Mzuni (see the model interactive page of the ODL instructional module at Mzuni in Figure 5.3 above).

Despite the constraints of access to hardware, software and data as referred to earlier, there was still evidence of technology being used as a tool within the field facilitation activity system. For example, one of the field facilitators from Mulanje Satellite Learning Centre said:

I used computer software 'crocodile technology' in physics particularly in Circuit Theory to simulate scientific laws with the aid of concrete examples for my students to understand science. (MJ-FF)

Crocodile Technology is an electronics simulator that is used to teach electronics concepts in physics (Nazihovna, 2023). The use of simulation has been helpful in fostering understanding of scientific concepts in resource-constrained contexts (Hamamous & Benjelloun, 2022).

This is testimony that computer software can be a vital tool that could aid student learning as students will be able to visualise the abstract theoretical concepts. This is because computer software in the form of models and simulations make abstract concepts more concrete. However, due to the absence of standardisation of the field facilitation practices and difficulties in access to

Internet connectivity and other necessary tools during the field facilitation sessions, there has not been equitable access and distribution of these valuable educational resources. However, there were indications of potential contradictions on the use of the tools as illustrated below.

KA-FGI: The field facilitators were teaching topics which were not on the course outline.

KA-FGI: The field facilitators insisted on the module as a guide to field facilitation and not the course outline.

Researcher: Did you have course outline as you went for field facilitation?

KA-FGI: Yes, they had course outlines but field facilitator insisted on the use of the module as a guide to teaching.

5.7.2 Pedagogical tools

Pedagogical tools are the instruments that are used by both the students and educators. In the context of this study, the pedagogical tools were in two categories, namely, the material instruments and methods instruments. The material instruments included the teaching/learning instruments such as the modules (print and electronic), textbooks, handouts, PowerPoint slides and course outlines. The methods instruments included group work, question and answer, coaching/ drilling and lecturing. The methods instruments were further categorised as student-centred and field facilitator-centred depending on how they were used. It should, however, be acknowledged that there were no clearly marked boundaries in the student-centred and field facilitator-centred categories as the instructional instruments in the two categories coincided as shown below.

Researcher: How do you do field facilitation?

LL-FF: We do it page by page. Do not solve questions or exercises with students. Leaves them to students to do on their own (to practice on their own).

Researcher: Does it work?

LL-FF: Yes, for those with required prerequisite skills and basic knowledge it is possible but challenging to those who lack this.

Researcher: What do you do with challenged students?

LL-FF: Resort to teaching. Step by step. I usually use lecturing method. It works well with those students who read ahead of the field facilitation session.

However, some students found this boring as remarked by one of the students in the Lilongwe FGI:

We found it time wasting because sometimes you go through the content which you already know. (LL-FGI)

Nevertheless, there were some field facilitators who were sensitive enough to the varying learning needs and abilities of students as the Karonga field facilitator remarked.

I combined both teaching and facilitation strategies to ensure that those who were struggling would at least learn something. Make ups were arranged to accommodate those with learning challenges. (KA-FF)

I mostly used advance reading and group discussions; I was though not comfortable with lecturing. It lacked an element of engagement between students and myself. (KA-FF)

The above therefore signals a contradiction within the student community (between the more knowledgeable ones and less knowledgeable ones). It seems it is problematic for the field facilitators to choose the appropriate field facilitation approach in a heterogeneous ODL class at the satellite learning centre. The differentiated field facilitation approach would have been appropriate for individualised learning support for the students.

In addition, there were a number of methods instruments that were used by the field facilitators. In particular, the students found group discussions useful. This was probably due to the benefits group work provides to student learning compared to solo learning (Kusmaryono & Kusumaningsih, 2021). In group work, students learn from each other, and this enhances individual student's ZPD (Kusmaryono & Kusumaningsih, 2021).

Researcher: Which methods or strategies did you find useful during field facilitation?

MJ-FGI: Mostly group discussion was very useful.

KA-FGI: Learner-centred techniques used like group discussions, panel discussions etc.

This is consistent with what the Karonga and Balaka field facilitators said:

> *I usually used Q&A, practicals, demonstrations etc! (KA-FF)*
>
> *I used the methods which I was familiar with 'lecturing' (BLK-FF)*

On the same note, besides the methods instruments, field facilitators made use of material instruments such as books, practice papers and chalkboard illustrations to explain concepts to students. However, not all of them were useful to students.

> *Researcher: What materials were used by the field facilitators in the field facilitation activities?*
>
> *LL-FGI: Mostly it is the module and sometimes they can source other books for themselves; they even gave us past papers to attempt to see how strong we were.*
>
> *MJ-FGI: Chalk, chalkboard, books and modules were used for field facilitation.*

Student-centred pedagogy was a challenge due to student diversity. While some students required remediation because they were not sufficiently prepared for field facilitation, it was a waste of time and boring to those who did advance study and were prepared for the field facilitation sessions. Although the field facilitators used the same lecturing methods as the lecturers on campus, the lecturing experiences during the field facilitation sessions seemed more rewarding. This was the case because of the robust student-field facilitator engagement at the satellite learning centre which was afforded by the student group size and flexibility of field facilitation tools that were used which served individual student learning needs as shown below.

> *Researcher: Did you find the methods useful? Did they really help your learning ... because I understand that they use the very same lecturing method how different is lecturing method there [at the satellite learning centre] and here [on campus]?*
>
> *LL-FGI: Yeah, sometimes it is so much useful because here (on campus) it is mostly lecturer centred but at the satellite learning centre, they involve us.*

To address differences in student preparedness and student learning needs, several field facilitators gave students formative home assignments to work on. The administration of home assignments was meant to address the learning needs or challenges of the students. These were necessary for

the field facilitator to know beforehand where students had challenges before providing the necessary learning support.

> *Researcher: Did you have an opportunity to take the science and the mathematics lessons beyond the classroom during field facilitation sessions?*
>
> *MZ-FGI: That opportunity is there whereby can give a homework, a work to be done at home.*
>
> *Researcher: Individually?*
>
> *MZ-FGI: Yah after a lesson we were told to try some problems as individuals.*
>
> *Researcher: What kind of assessment are you talking about?*
>
> *MJ-FGI: That kind of assessment that would not necessarily be graded nor credited but that which would help the student or facilitator evaluate or check whether learning is taking place or not.*

The home assignments seemed to connect students to learning through assessments. These were informal formative assessments which would not necessarily be graded or contribute to credits for progression but those which would support student learning. Formative assessments are critical for student learning through the feedback that follows the assessment (Archila et al., 2022; Ramnarain et al., 2022). As one of the field facilitators remarked in a CLW:

> *There is a need to conduct assessments as they are part and parcel of learning. Facilitation without assessing the students is like nsima [Malawian local main dish] without relish. These assessments should be marked, and feedback should be given to students. (FFWG)*

This practice was acknowledged by a student in the interviews.

> *The field facilitator was giving us like assignments and practice questions from the examinations past papers to check our understanding of content. (LL-FGI)*

The assignments were either taken from the module or Mzuni past examination papers or other higher educational institutions other than Mzuzu University. These assignments or assessment tools were solely for students' formative assessment. The field facilitators marked the assignments and provided feedback for students to check whether or not learning was taking place. For example, one of the students from Lilongwe student FGI said:

Sometimes he was giving us like home assignment then after doing home assignment … and communicate we have these problems, then we could go back and make corrections. (LL-FGI)

Despite the enormous benefits of field facilitation as evidenced from the discussions above, it seems that the f2f implementation of the field facilitation activity had challenges. Such challenges would be significantly reduced through the use of ICT as illustrated below.

Making field facilitators organise localised sessions closer to students' homes or workplaces would be expecting too much from the field facilitators … the best is to use instructional technology which I guess could also be a problem to our learners. (LWG)

Virtual facilitation is another option worth exploring. With virtual environment, students have the opportunity to access learning resources and receive academic support in terms of relevant videos and illustrations on science concepts on learning management systems. However, all these require stable Internet with good band width. (FFWG)

According to a Malawi Times report on April 2023, there has been a huge rise in Internet use in Malawi which is currently at 24.4%. However, gaps remain, such as poor infrastructural development particularly in rural Malawi which makes Internet accessibility a challenge to a large proportion of the Malawian population (NSO, 2018). This shows the potential great digital divide in Malawi which frustrates the affordances of ICT technologies in teaching and learning through ODL. However, to make the best use of the tools that are available, training support on the use of ICT in teaching and learning in ODL contexts is necessary.

As a solution to this, there is need for refresher courses on how to field facilitate ODL students. Science is dynamic and as technology is advancing, new approaches are being devised which calls for continuous training. (FFWG)

5.7.3 Practice regulators

Explicit practice regulation tools during field facilitation included field facilitation contracts and field facilitators' attendance forms. These are besides other practice regulators which are just implicit to field facilitation activities. As discussed in sections 5.3.4 and 5.3.5, the implicit tools include the students' information handbook and the ODL policy of Mzuni (D6; D9). In the field facilitation activity system where the object (enhanced learning and success in Science and

Mathematics) that would result in enhanced retention and throughput is being collectively pursued in a community of students, lecturers and the ODL staff, the absence of field facilitator induction means that the field facilitators would be working without guidance from the students' handbook and ODL policy of Mzuni as field facilitation practice regulators.

Furthermore, the community is assigned roles (division of labour) oriented towards the same object (enhanced retention and throughput). The absence of field facilitator induction and assuming that by the fact that field facilitators are secondary school teachers and former Science and Mathematics education graduates who can ably handle field facilitation would compromise the quality of field facilitation practice. This is different with the explicit practice regulators in the field facilitation practice such as field facilitation contracts and field facilitation attendance documents (D10; D11). For example, field facilitation contract document and field facilitator attendance forms are given to the field facilitators and clearly stipulate the university's expectation from the field facilitators. Students' information handbook and the Mzuni ODL policy as critical field facilitation regulators are not part of the field facilitation toolkit as far as field facilitation regulation is concerned which in addition to the absence of field facilitator induction would compromise the quality of field facilitation.

5.8 Conclusion

This chapter analysed the data to describe each component and how it functioned within the activity system. The analysis has shown that the activity system did not function as expected due to the tensions within the field facilitation activity system and between the field facilitation activity system and the larger Mzuni activity system. The tensions within these activity systems were largely due to stakeholder oversights prior to the implementation of ODL programmes at Mzuni. This chapter therefore highlighted key contradictions in the field facilitation activity system which provides the base for the next chapter, Chapter Six, where I pull out the key contradictions that emerged from this mapping of the activity system and deliberate on how the field facilitation activity system can be improved for the enhanced learning and success of ODL students with an expectation of improved student retention and throughput.

CHAPTER SIX: EXPANSIVE TRANSFORMATION OF THE FIELD FACILITATION ACTIVITY SYSTEM

6.1 Introduction

In the previous chapter, Chapter Five, I presented the analysis of the field facilitation activity system in the B.Ed Science programme under the ODL mode of delivery at Mzuni. I used second-generation Activity Theory to undertake an analysis of the field facilitation activity system to unveil how each of the components worked together to form one activity system focused on an object that was driving towards a shared outcome. I indicated that the shared object was *enhanced learning and success* and the expected outcome was *improved retention and throughput* of students. However, I also indicated that the data illustrated some tensions and contradictions emerging from the data in the extent to which the various components of the activity system could work together in a complementary manner. In this Chapter, I respond to the research question *How would the current field facilitation strategy be improved for enhanced learning and success in science and mathematics through ODL mode of delivery?*

As Engeström and Sannino (2021) indicate, a crucial aspect of second-generation Activity Theory studies is an analysis of the contradictions within the activity system. This analysis thus requires that I move beyond identifying the components of the activity system to identifying the contradictions behind some of the troublesome experiences. Identifying contradictions is essential to creating expansive possibilities. In Chapter Five, I briefly identified several contradictions in this activity system. In this chapter, I discuss these and additional contradictions in more detail, and I look at those aspects that could be considered starting points for expansive learning and for possible change or transformation of the field facilitation activity system. Contradictions can open up a kind of ZPD in that they can provide opportunities for an activity system to develop from where it is now to where it could be in the future (Vygotsky, 1978).

There was generally consensus across the data about the outcome for the field facilitation activity system. The documents and interviews indicated that all components of the activity system were geared towards achieving the object, which was enhanced student learning and success. This focus

on learning and success, linked to improved "retention and throughput" could be found in the general university documents and in the documents explaining why field facilitation was introduced. The lecturers conceptualised the field facilitation activity system as being in service of such improvements and the facilitators themselves saw their job as enhancing student learning and success. Despite this shared outcome, in this chapter I will argue that there were many contradictions in how the *object* of the activity system was addressed by the different components. The object was largely understood as *facilitating student learning* to enhance students' success (which was seen as key to improved retention and throughput). But within this understanding were contradictions: if the object was to facilitate learning, there would need to be a close alignment between what happened in the field facilitation activity system and what happened in the curriculum, including the content structuring, the lecturing and the assessment. Furthermore, if the object of the field facilitation system was to facilitate learning, the activity system would need to be supported and quality assured by the university to enable it to achieve this object and thereby support the outcome.

There was ample evidence that the object of the activity system was perhaps not as clearly understood or shared by all parties, and this restricted the full potential of the activity system to support the outcome of enhanced student learning and success. As I will illustrate, this was evident in the way in which the field facilitators in this study were appointed, trained and rewarded in the undertaking of their activities. The contradictions in how the object of the activity system was understood were also evident in the pedagogy of the field facilitation including in the division of labour between the field facilitators and the lecturers and in the tools available for the field facilitation processes. I will now thematically unpack some of the contradictions identified in the activity system.

6.2 Pedagogy

Student-centredness was often cited in the data as guiding the approach to teaching and learning in the field facilitation activity system. Student-centredness refers to the situation where the students take an active rather than a passive role in the learning process (Tangney, 2014; Zairul, 2020). Student-centred learning denotes "active learning" and research suggests it results in better learning outcomes than traditional transmission teaching methods (Freeman et al., 2014). Student-

centred learning engages students in the process of learning through activities or discussion in class as opposed to passively listening to an expert. Such activities can enhance students' scientific performances, including both knowledge and understanding levels (Liu et al., 2009). There was much evidence in the data that many of the field facilitation sessions were student-centered and that this was much appreciated by the students.

> *There (at satellite learning centre) it was so helpful. The field facilitators gave us a lot of activities unlike here (on campus), lecturers simply took us through the modules. They did not care whether we were following or not… but there, they involved us most of the time. … Sometimes we were given chance to identify areas where we had problems. We could give him a problem. He would then assist. (LL-FGI)*

There was evidence that the focus in many field facilitation sessions was on identifying the students' learning needs and working on aspects of their studies that they had identified as problematic.

> *We decided as a group. We would get the module then decided as a group where we needed support. (LL-FGI)*
>
> *For the learning aspect it is both students and facilitators who identify areas for field facilitation support since field facilitation is student and problem centred. On key field facilitation agenda, students agree as a group on what to be covered depending on what was covered or done during module orientation on campus. Students prioritise what is not covered on campus. (MJ-FGI)*

Jere (2012) argues that peer support and guided collaborative learning in academic activities result in greater confidence and participation in class and building supportive social networks and reducing student isolation.

> *We actually asked them (field facilitators) to pause, repeat statements with field facilitators... things that we cannot do here (on campus) with lecturers. It looked awkward to ask a lot of questions in class and even lecturers were not happy with it. It seemed as a time waster. (BLK-FGI)*

Vygotsky's (1978) notion of scaffolding is an important means of making sense of why the students found this approach so useful. The identification of areas of learning needs by the students

and the attempts by the facilitators to enable peer-learning suggest that the activity was directed towards scaffolded support within the students' ZPD. As a reminder, the ZPD is defined as:

> The difference between … developmental level as determined by the independent problem solving and the higher level of potential development as determined through problem solving under … guidance or in collaboration with more capable peers. (Vygotsky, 1978, p. 86)

It was evident that the pedagogy of the field facilitation was often collaborative and that the students were encouraged to actively engage with each other and the field facilitators. Students do not learn in isolation but rather learn through interactions with others and the social environment (Vygotsky, 1978). Participation in these activities is understood to be at the centre of the transformation process to becoming competent members of the knowledge community (Saka et al., 2009).

The data also suggests that a key affordance for this engaged participation in the field facilitation context at Mzuni was the size of the group. Class sizes at the Satellite Learning Centres was repeatedly noted as one of the factors that contributed to successful student learning because group sizes were much smaller compared to the class size at the university during the module orientation sessions (Mzuzu Academic Office, 2018).

> *Since we were fewer than we were in the class here on campus... there (at Satellite Learning Centres), we were able to interact with the field facilitators. (MZ-FGI)*
>
> *Because we were fewer the field facilitator assisted us individually and we were also free to ask questions. (LL-FGI)*

Literature suggests that a key aspect of learning is having the opportunity to transform what is being learnt and eventually become transformed by what is learnt (Farhangi, 2018). This is only possible however if students feel that they are valued (Gondwe & Longnecker, 2015). The data suggests that the small class sizes coupled with field facilitator creativity and resourcefulness generally contributed to a relaxed, friendly and developmentally appropriate environment.

Despite this positive picture of a student-centred pedagogy characterising the field facilitation activity system, there were also concerns raised in the data that challenged this view. In some

cases, field facilitators and students indicated that a more traditional transmission mode of pedagogy was used. In this study, what this means is re-teaching or lecturing the content of the module to the students.

> *They do it page by page as students were already familiar [with this method]. (LL-FF)*
>
> *They [field facilitators] use the very same lecturer method as used by lecturers. (LL-FGI)*

Field facilitation was characterised in some of the data as "more of the same" in which content not covered on campus was covered in the same content-focused way in the Satellite Learning Centres.

> *When we are here [on campus] sometimes we just cover little content and when we go there [Satellite Learning Centres], we have at least chance to cover some other topics that we didn't cover here. While we go there [Satellite Learning Centre] they [field facilitators] teach. (MJ-FGI)*

It is important to note that the field facilitators themselves seemed unclear as to whether their role was remedial and focused on addressing gaps in students' knowledge, re-teaching what was taught on the main campus, scaffolding the ZPD of the students to ensure that students could connect existing knowledge to the new knowledge or extending students' understandings from their limited interaction with lecturers and learning materials, or a combination of all of these. The field facilitators noted challenges in managing the wide differentiation in the preparedness of the students and the various learning needs within the diverse student body. There is a primary contradiction here in the division of labour between what field facilitation is expected to be (not lecturing) and what it tends to end up being (too much lecturing). The lecturers are supposed to teach in a more traditional transmission mode during the f2f campus time, and field facilitators are supposed to use more creative, student-centred methods to enhance students' understanding, deeper learning and ultimate success in the modules.

The policy data indicates that field facilitators are responsible for planning for field facilitation sessions in areas of concern in Science and Mathematics in consultation with the students *and lecturers* (D9). Although this is stipulated in the ODL Steering Committee minutes, it did not happen in practice. What happened was that the students informed the cluster leader or a locally identified class representative at the satellite learning centre level about the logistics and learning

needs related to the field facilitation, who in turn communicated this to the field facilitator. The data suggests very limited communication between the lecturers and the field facilitators.

> *There was need for some sort of linkage or collaboration between the field facilitator and the lecturer. (LP)*
>
> *Field facilitator induction, periodic reports of what they are doing would be helpful so that the lecturer can follow up with them, at least some sort of system of supervising these people. Because otherwise they may not approach the content the way intended by the University. (LB)*

These quotes indicate that lecturers themselves had expectations that the field facilitators needed to meet regarding enhancing student learning, underscoring this contradiction. This lack of communication was especially problematic when the field facilitators were not fully informed of the *progression rules and assessment processes*, and this added another layer of complexity to the sometimes instrumentalist approach of completing the course outline (syllabus) and preparing for assessments.

> *The way you facilitate has an influence in the way you will assess, if there is no collaboration between the lecturer and the field facilitator, they (field facilitators) might not teach the way the lecturer would want. (LC)*

There was a strong sense across the data that training was needed to ensure alignment between the pedagogy, course content and assessment on campus with the activities in the field facilitation system. Lecturers and students commented that training and orientation for field facilitators conducted by the lecturers would be really helpful, to ensure that they are *"on the same page"* (LM). Students commented that they need to be *"trained in the way they do facilitation" (MZ-FGI).*

> *Some sort of an orientation to the field facilitator would be helpful so they should be on the same page with lecturers. What areas are critical for the students? The lecturer should be able to say I did a, b, c but I would think my students still struggle on this. (LB)*

This is an indication of the general consensus between students and lecturers that field facilitators should be trained on their roles if they are to do the work as expected by the university.

Some of the lecturers teaching in the B.Ed Science programme for teachers are scientists rather than teacher educators. The field facilitators are active mathematics and science teachers working in secondary schools. This meant that some lecturers took a "pure" rather than "applied" approach to teaching the mathematics and the sciences which "detached" the learning from the context of teacher education. The field facilitators had more of this contextual knowledge, but due to the lack of communication between lecturers and facilitators, this knowledge could not be shared. As one of the lecturers put it:

> *The way we approach content should not be same as you approach content for a pure content person, actually that is one problem that we are having in our education system because we are running a model where we get content from the BSc programme then you go elsewhere where you learn the education and the methodology, that's the model we are using now while our colleagues now have gone beyond that stage where they teach physics for teachers. Our model seems to be detached from the context. Real learning is context based. (LP)*

There was a concern that the focus on learning the science content took away from the development of students as teachers. A concern was expressed that the curriculum failed to integrate the educational aspects necessary to equip teachers for practice. The concern that the focus on science content was at the expense of a focus on pedagogy can also be seen in the contradictory data about whether the field facilitation was transmission mode or student-centred. There was a concern that there were few spaces to develop the students as teachers that originated from the curriculum owners and implementers (the lecturers).

There was a sense that because not all lecturers had educational expertise, they might not be well placed to develop this in students. The lecturers arguably had a double challenge. They were moving from a situation of teaching pure Science and Mathematics content to teaching how to be Science and Mathematics educators and at the same time having to consider the implications of doing this in an ODL context. There is a Chichewa proverb that comes to mind here:

> *Chingakhale chapafupi kudutsa mu mphechepeche mwa njobvu imodzi kawiri kuyerekeza ndikudutsa mu mphechepeche mwa njobvu ziwiri kawiri.*

This loosely translates as:

> It would be less challenging to walk under an elephant twice than to walk under two elephants twice.

By adapting the curriculum, classroom pedagogy and field facilitation strategies to make the B.Ed Science programme more contextualised and less "pure" in terms of the learning, the lecturers and field facilitators would only have to walk under the elephant of teacher training once.

Yet, the opportunities for the field facilitators to consider the extent to which they were preparing students to be teachers of Science and Mathematics were severely constrained by the ODL context. There was limited contact time, limited support materials, and at times, limited confidence in the field facilitators' credibility (all issues I discuss in the next two sections). This made the approach to pedagogy in the activity system extremely challenging.

Furthermore, ODL has historically been seen to be for those who cannot access f2f education for financial or academic reasons and targets "pedagogically neglected" students (Yaroshevsky, 1989, p. 96). This might reinforce the remedial understanding of field facilitation activities neglecting the necessity of student autonomy in studying through ODL. This is, however, challenging considering the fact that historically these students come from secondary schools where the mode of teaching and learning is f2f. Learning through ODL is a novel pedagogical strategy which requires proper student preparation for them to study through ODL as evidenced in some of the field facilitator data.

> *Students seem not to be ready for self-regulated learning. We do it page by page as most students are not able to identify what they can do on their own and what requires our assistance. Students always say that field facilitators need to teach everything because they did not understand during module orientation sessions on campus. (LL-FF)*

> *Some [field facilitators] believed that by doing it page by page they are assisting students more as compared to presenting only critical areas of the module as such they don't believe that students can learn other simpler units on their own. (LM)*

Research has shown that it is a particular challenge for lecturers serving in dual-mode institutions to ensure that both modes of study are supported adequately (Muyinda, 2009). The lecturers in this activity system offer programmes through both f2f and ODL delivery modes. Historically,

programmes in the Faculty of Education were f2f, and ODL programmes were introduced after the f2f programmes had already been introduced, with the curriculum mirroring the f2f programmes in structure and content.

The data suggests two key contradictions in relation to pedagogy that open a space for important conversations about field facilitator induction, training and support, and greater and more consistent contact between field facilitators and lecturers within the programme. The issue of scaffolded learning, discussed here, is linked to the extent to which the field facilitators (and the lecturers) are sufficiently aware of who the students are and what their needs are (Hughes, 2004). Scaffolding students learning from their ZPDs entails having a solid understanding of the student body.

6.3 Understanding the Students

In providing student support, universities should focus on what the student needs, not on what the universities want to or are able to supply, but it is surprising how easily this emphasis can be lost in their wish to help. Universities would identify real needs best if they know their students (Hughes, 2004). There was a contradiction in how the field facilitators knew or understood the students. Some indicated that students are supposed to be independent learners in an ODL context and that they were lacking in this regard. It was evident that field facilitators, the subject of this activity system, and lecturers and students, as the activity system community, all had varying and conflicting ideas about what students were meant to already know and do as they enter the course. Being ODL students coming from a f2f background created the feeling of uncertainty of what their roles would be in the learning process.

> *An ODL student should be fairly independent so where they feel that am not making head- way they have tried all they can to go through modules then they are free to contact the lecturers here [on campus] (LC)*
>
> *Calibre of students selected are challenged in terms of content. Their overall grades could be okay but quality in science subjects on selection should be considered. (LL-FF)*

One example of student demographics with significant implications for field facilitation pedagogy and the activity system as a whole is the rural or urban status of each student. The ODL students

at Mzuni are drawn from all over Malawi. According to the National Statistics Survey by the Malawi Government in 2018, Malawi's urban population was 15.3% of the total population. This means the majority of the Malawian population (84.7%) reside in rural areas. Access to ICT services such as Internet in rural areas of Malawi like any other developing country is a challenge (Malawi NSO, 2018). Rural students are required to travel longer distances to urban centres to access reliable Internet and telecommunication services. This is an additional cost to their educational expenses which would discourage rural students from studying compared to their urban counterparts, or having registered, may discourage them from participating fully in all available learning opportunities. According to survey data in this study, the majority of the students came from rural areas: 80% or 40 out of 50 respondents who responded to the item of whether you come from an urban or rural area indicated that they come from rural areas. According to the National Statistics of the Malawi Government (2018) and Yaya et al. (2016), the majority of these respondents would struggle to access learning support services through ODL as requisite services are predominantly in urban areas.

Furthermore, some students are unemployed while others work full-time or part time. Out of the 65 respondents to the survey item of whether students were employed or unemployed, 31 respondents were unemployed. The slight majority of 34 respondents out of the 65 respondents reported that they were employed. And of those who were employed, there was a divide between whether they were employed in the education sector or not. Twenty-seven out of the 34 respondents who responded to the questionnaire item of whether they work full-time or part-time reported that they worked full-time, while seven of the 34 respondents reported that they worked part-time. For the other category – whose work is either related to the programme of study or not – the survey statistics indicated that 27 out of 32 respondents who answered this questionnaire item indicated that they worked in the education sector while five respondents indicated that they worked in an industry unrelated to the programme of study.

Working students seemed to have an advantage over the non-working students on two fronts. Firstly, being employed meant that these students were income earners and could more easily meet field facilitation related costs. The student FGIs showed that some students failed to attend field facilitation sessions due to financial challenges. Secondly, those working in the education sector

had the advantage of being familiar with some of the content matter which made their self-regulated learning easier.

However, being employed also meant that they had obligations to attend to their work which resulted in them at times being absent from field facilitation sessions. For example, it was shown in the data that in certain cases students requested to have field facilitation sessions squeezed into short blocks of time when the students were able to take leave from work.

> *I usually blocked my students for 2 weeks and squeeze all the content within this time. (MZ-FF)*
>
> *We met the field facilitators during the weekends since some of our colleagues [students] are employed and the field facilitators too have full-time employment elsewhere. (KA-FGI)*

Another aspect of student demographics that has implications for the success of the field facilitation activity was gender. The survey statistics showed that the majority of the respondents to the surveys were male (45 of the 65 respondents) while only 20 of the 65 respondents were female students. Globally, Science and Mathematics are male dominated disciplines (Makarova et al., 2019) and the female/male ratio in terms of field facilitation participation perpetuates this gender divide. Such inequalities limit the full participation of women in this learning space. Increasing the visibility of female role models in STEM disciplines is recommended by Carmen et al. (2019) as a strategy for encouraging female student participation in the discipline. This might be an issue to consider in the appointment of lecturers and field facilitators.

This points to the secondary contradiction between the community (the university wide community) and the rules in form of Mzuni's local admission policy which advocates for a 50:50 admission ratio for female and male students. This therefore calls for policy makers to come up with strategies on how the 50:50 admission ratio could be addressed.

6.4 Credibility, Identity and Roles of Field Facilitators

There were tensions related to the field facilitators' credibility and this constrained their agency within the activity system. This issue of credibility is related to how field facilitators are recruited and employed. Students under the leadership of the cluster leader are mandated to start the field

facilitator recruitment process by identifying individuals to be considered for field facilitation posts. This immediately raises questions about the credibility and suitability of the field facilitators.

> *The university should lead in the identification of field facilitators which means the university will look for good quality facilitators who can do the job well. (BLK-FGI)*

The practice of giving the students the power to identify the field facilitators raised a lot of concerns, not only among students, but also among field facilitators and lecturers. The students and lecturers doubted if students would really appoint good quality field facilitators who could challenge them in the learning process, or if they appointed field facilitators who were friends and just wanted to assist them in gaining some extra employment and income.

> *The practice of leaving the identification of field facilitators to students may lead to identifying individuals who might not be capable hence the huge compromise on quality of field facilitation. (MJ-FGI)*

After the field facilitators are identified, the cluster leaders collect their CVs and copies of certificates from the field facilitators. These are presented to university management and the University Registrar for vetting and hiring. After the field facilitators are vetted, they are required to complete a field facilitation contract form. The cluster leaders, rather than the registrar or other senior university representative, communicates with the field facilitators and arranges when and where the contract forms should be completed. It was further stipulated that a field facilitation contract is only valid for one semester with possible extension to another semester (D9) upon satisfactory work by the field facilitator, an issue I return to later.

The lecturers' comments reinforce the students' concerns. They too questioned the reasoning behind students identifying their own field facilitators. The greatest concern among lecturers was a quality concern. The lecturers doubted if students were in a position to choose good quality field facilitators who would really support them in the learning process.

> *I think we should not compromise on quality. I wonder how we think students would be able to identify someone who has the quality that the university would take. As an institution we technically say we would want someone who has a minimum of master's degree to be a lecturer, now we are*

asking students to pick on a bachelor's degree and I don't understand how they have done it, how transparent it has been. (LP)

Although leaving the responsibility of identifying field facilitators in the hands of students could be seen as democratic and empowering students in decision making in matters affecting their own learning, it remains questionable whether this is suitably aligned to the activity system outcome of increased retention and throughput.

Let the heads of departments help the ODL Centre in identifying those people (field facilitators) just like they do with the adjuncts (part-time lecturers) in f2f programmes, because they usually get people specific to the field. Because at the end of the day they are the custodians of the academic issues anyway... so they need to be sure that the students are being supported as we would want at the departmental level. (LM)

As indicated in Chapter Five, anyone who is hired to support academic staff in teaching on a part-time or adjunct basis should have a master's degree as a minimum qualification and be identified by the academic head of department concerned (D1). This is not implemented in the field facilitation activity system raising a significant contradiction. Thus, this process of enabling students to recruit and choose field facilitators raises a secondary contradiction between the subject and the rules and between the community and the rules. The rules stipulate, in part, a process that is not followed, and members of the community (students, lecturers and field facilitators) have serious concerns about the legitimacy of the current recruitment process.

Related to the process of appointing the field facilitators were concerns raised about their qualifications, experience and content expertise.

The one who is conversant with the area of study concerned, as long as you have someone who is conversant it could be the person who facilitated the module, it could be someone else but it should be someone who is competent enough in that field of study. They should also know the institutional culture and traditions as well as conventions… that is the sort of orientation needed for the field facilitators. (LB)

I will give an example of the field of ecology; someone may have a degree in science may be majored in biology and has a credit but may not be competent in ecology. (LB)

There are two categories of academic members of staff at Mzuni. These are full-time (tenured) and contract (short-term and long-term) based employees. The long-term contractual employees have a contract duration of four years while the short-term contractual employees are usually employed on a semester basis. Field facilitators belong to the short-term contract employment as their employment is valid only for one semester. The high turnover of field facilitators results largely from this short-term appointment. There is also little to no financial or time investment in training field facilitators or communication between lecturers and field facilitators if it is not possible that they will be employed in this position a few months later (hiring field facilitators on a semester basis).

While the data indicated strong support in principle by university management and academic lecturers for the field facilitation activity system, it was evident that little time and limited money had been invested in ensuring that the field facilitators were suitably selected, trained, and supported. Many of the findings of this study could be used to enable transformative agency among the field facilitators themselves as the subjects of the activity system by raising questions about appropriate pedagogy and the need to understand the student body better. But addressing the concerns raised in this particular section on the credibility and identity of the field facilitators is beyond the realm of power of the facilitators. The contradictions in the activity system discussed here require significant rethinking by university management and the relevant heads of departments as to how the field facilitators can be better identified and supported.

The concerns about the identification and training of field facilitators suggests that the potential for the field facilitation activity system to address the shared outcome of student retention and throughput was constrained. Unless the university as a whole considers these findings, it is unlikely that the system can achieve its potential effectiveness in its object of facilitating student learning. A further contradiction between the object and the university's support for field facilitation can be seen in the time allocated to this. As discussed in Chapter Five, field facilitators are paid for a maximum of sixteen hours of work with students in the Satellite Learning Centres. The decision to allocate 16 hours to field facilitation activities was not underpinned by pedagogical considerations nor was it decided in deliberation with the lecturers regarding which curriculum aspects would most benefit the students from field facilitator scaffolding.

> *Not really [much engagement in field facilitation sessions] because there is time limitation. We are given a ceiling of 16 hours for the entire 16-week distance phase of the semester. (MJ-FGI)*

The object, of course, is enhanced student learning and success, which means that students need time with the field facilitators so that different forms of pedagogical tools can be used to meet the various student learning needs. This contradiction between the object and the time allocated to field facilitation (rules) impacts the choices field facilitators make with that time.

> *I resorted to teaching because of lack of adequate time to do facilitation. (BLK-FF)*
>
> *Time was inadequate because we (field facilitators) meet students face-to-face. To make sure that students have enough time on content learning, we (field facilitators) should give homework or assignments to students in preparation for subsequent field facilitation sessions. (LL-FF)*

There was some flexibility in how the field facilitators divided up the allocated 16 hours. Flexibility is an enabler to student learning in an ODL environment. Chibambo (2016) and Prinsloo (2010) assert that flexibility is one of the important features of distance learning. But as indicated earlier, these hours often had to be allocated according to the work schedules of the facilitator and the students. Furthermore, the benefits of flexibility need to be considered alongside the extent to which the allocation of the 16 hours were sufficient to address the object (and ultimately the outcome) of the activity system.

Quantifying meeting time between students and field facilitators proved problematic as it limited students and field facilitators meetings or engagements. This meant students and field facilitators would only meet during the allocated time which would not allow learning support to be available wherever and whenever students desired. There was ample data that more than 16 hours were typically spent by each facilitator because extensions to the f2f meetings between students and field facilitators which were virtually done out of the field facilitators' initiative typically via WhatsApp discussions with individual students or in groups. Such interactions were neither documented nor compensated. The contract made no reference to whether field facilitation activities should occur outside the 16 hours of f2f meetings and the facilitators shared an awareness that the time they spent on virtual interactions would not be compensated.

While tools such as WhatsApp were seen to be vital in the success of the field facilitation activity system because they enable student learning anytime, anywhere the field facilitators expressed concern that officially student contact should not exceed 16 hours (D9). And that facilitator efforts were not rewarded beyond the 16 hours set out in their contract (D10).

> *We have a WhatsApp group where we ask questions and the field facilitator is a member of that group. (LL-FGI)*

The time constraints were seen by the field facilitators to have a big influence on the possible pedagogical approaches. This problem originates from the fact that the university does not specify in their terms of contract what the roles of field facilitators will be (D9).

This section has looked at issues pertaining to the field facilitators themselves. It has considered their appointment, their (lack of) training, their (lack of) communication with lecturers and the limited time available to them. All of these constrain the effectiveness of the activity system. It is important to stress here that many of these findings could not be mirrored to the field facilitators in a Change Laboratory in the hope of their developing solutions. In most of the findings here, the possible solutions lie outside of the power of the field facilitators.

> An obvious limitation of action as a unit of analysis is that it does not explicitly address the social relations and organisational embeddedness of work actions. In other words, it runs the risk of locating explanations for disturbances and problems as well as innovations and emancipation in work exclusively in the individual worker. (Engeström & Sannino, 2021, 7).

The subject alone cannot account for the practices identified within the activity system.

6.5 Learning Materials and the Digital Divide

There was ample evidence in the data of innovative use of low bandwidth and low-tech tools such as WhatsApp. However, it was clear that for more interactive student-centred learning to be offered in this ODL context the enormous national constrictions around bandwidth, access to data and relevant equipment, and the necessary technological literacy practices, all need to be addressed.

The instructional modules usually in print form acted as the guide to field facilitators during the field facilitation sessions. The instructional module contains the detailed content which the student

is expected to learn (D7). The module is in both print and electronic form (pdf format). The contents of the module are presented in smaller chunks or segments called units for easy management by the student during the self-regulated learning process. They are presented in an interactive way which makes self-regulated learning possible. At the end of each learning unit, there are assessments which are aimed at student self-assessment. These are in the form of quizzes, short assignments and reflection essays all aimed at students' self-assessment. To ensure that students' self-assessment is complete, expected answers to these self-assessment activities are included at the end of the module. Finally, there is an end-of-module test which also becomes an end-of-course test. This comes at the very end of the module which represents students' summative assessment of the module.

While the instructional modules were largely interactive, it is possible to critique the extent to which they support a student-centred pedagogy. The language of the modules as units to be completed in a linear fashion potentially suggest an instrumentalist pedagogy of completing the syllabus in preparation for exams rather than developing critical knowers who can engage with the field of study. The outcome of retention and throughput which was shared across the activity system initially presents as uncomplicated and entirely desirable. But given the logistical constraints of the field facilitation system and the contradictions presented here it starts to suggest that the outcome of retention and throughput might be understood in fairly simplistic ways and leads to a more instrumentalist approach to education by the field facilitators, the lecturers and the students themselves. This would need to be unpacked in much more detail in any attempt to ensure a strengthening of the field facilitation activity system.

Furthermore, there were cases where the instructional module was not available and so handouts and some textbooks were used to aid student learning. These became instructional materials under the recommendation of the lecturer responsible. However, the challenge was that these other materials (handouts and textbooks) were not developed for self-regulated learning as they were not packaged or developed for ODL pedagogies. While this study did not do a deep analysis of all learning materials, ample data related to the teaching materials that were available to students and a look at the instructional modules suggest a fairly instrumentalist pedagogy. While there was

space for students to write in such texts and to complete exercises within them, the focus was largely on covering the content.

> *There is a need to improve on how the modules are written. Make them simple or interactive for them to be self-explanatory. (LL-FF)*
>
> *The Mzuni curriculum tools [the modules] are complicated. Not developed logically. Some topics which are meant for higher levels are being presented at lower levels. (MJ-FF)*

The content of the ODL materials was often quite similar to that of textbooks used in f2f pedagogy with few interactive exercises embedded within them. Furthermore, computer software has minimally been used at the university for ODL students, though it has been observed that it can aid student understanding of scientific concepts.

> *Increasing meeting time and a variety of resources would be helpful such as using video-recorded resources, video conferencing etc! (MJ-FF)*

Several lecturers and field facilitators commented on the affordances that computer software could offer for student learning to enable them to visualise abstract theoretical concepts. However, Malawi being a resource-constrained context, like other developing contexts, would not benefit adequately from the affordances ICT offer in the ODL curriculum delivery. Technology-enhanced flexible curriculum provision can be accessed by anyone, anytime, from anywhere, but only if they have resources such as a conducive learning environment, electricity, Internet connectivity, devices and digital literacy skills (Magunje & Chigona, 2021). Infrastructural challenges in Malawi where electricity supply and Internet connectivity are erratic make for a context of an extreme digital divide – the majority of ODL students come from rural areas where services such as electricity and Internet connectivity are even less accessible (NSO, 2018) and there is a lack of student accessibility to online learning devices due to student poverty levels. Flexible field facilitation is challenging as it cannot benefit from the affordances of online or digital technologies, other than what WhatsApp can offer.

While Mzuni has passionately pushed for digital learning, online curriculum delivery has not yet been fully embraced due to inadequate digital literacy among users, particularly the ODL students, and significant logistical issues around access to data and the Internet. The ODL students at Mzuni

are predominantly rural and are not privileged in terms of access to digital or ICT tools [Survey data]. Furthermore, Magunje and Chigona (2021) argue that provision of ICT infrastructure in an educational setting does not necessarily lead to adoption. The successful implementation of online field facilitation would need to go beyond ensuring access to data and connectivity to include the development of the necessary literacies (Magunje & Chigona, 2021).

6.6 The Nature of Open and Distance Learning Insufficiently Built into Larger University Activity System

Assessment rules at Mzuni are generic; the very same assessment rules apply both to the ODL as well as the f2f students (D8). However, ODL and f2f students are different sets of students with different learning needs and challenges. This therefore means that ODL students are being guided by assessment rules which are not designed for them. Such assessment rules can be seen to be a barrier to academic success of the ODL students.

The Faculty of Education which administers the B.Ed Science programme follows 40%:60% assessment allocation, that is, 40% for continuous assessment and 60% for end-of-semester examinations. For courses that involve practical/lab work, the sciences (biology, chemistry and physics) in this case, the continuous assessment comprises:

- a minimum of two practical/laboratory work assessments weighted at 10% of the average mark;
- a minimum of two exercises weighted at 15% of the average mark; and
- a minimum of two tests weighted at 25% of the average mark (D8).

Although the above reflects what is stated in the assessment policy, what actually takes place for the ODL students is different. Usually and practically, instead of having a minimum of two exercises that contribute 15% of the continuous assessment grade, such exercises are not administered. For the tests which are usually called mid-semester examinations, one test is administered against the policy of a minimum of two. In the case of practicals or laboratory work which are conducted after 14 weeks of the distance phase of the semester (three weeks before the examinations preparation week), the set condition is met. However, critical in all these assessments is that they are all undertaken towards the end of the semester which does not enable student

learning but rather student confusion. The ODL students have minimal opportunities to practice through formative assessment and very few opportunities to receive feedback, which is so vital to learning.

> *When they come for science practicals, it's when we actually do mid-semester test and the mid-semester does not serve the purpose because it's supposed to be halfway, in that way my students would have feedback. (LC)*

This condensing of assessments for ODL students had poor effects on both the students and the lecturers. Lecturers complained of having a lot of work to mark within a limited time which resulted in delayed feedback or no feedback at all to students. This challenge denied students an opportunity to make necessary revisions and learn from mistakes made.

> *No student shall be allowed to sit end-of-semester examinations if s/he does not have a continuous assessment grade (D8).*

The above rule does not indicate the quality of the continuous assessment or the grade to be achieved but rather the presence of a grade. Such insensitivity could have a bearing on student success particularly those studying through ODL where continuous assessment tasks serve dual functions of aiding student learning and contributing to an end-of-semester grade for progression purposes. Clarifications on the quality of continuous assessment grades would be a guide on student readiness for the end-of-semester examination and the forthcoming academic year work.

This far, I have discussed the contradictions that emerged in the field facilitation activity system. Presented in Table 6.1 that follows is the summary of the contradictions pointing towards possibilities for expansive learning.

Table 6.1: Summary of contradictions within the activity system

Category of contradiction	Type of contradiction	Example(s) of contradictions	Epistemic Action(s)	Model solution(s)
Object (*Enhanced learning experiences and success*)	Secondary	Between community and division of labour, tools and division of labour.	Questioning, analysis and modelling	Orientation/ induction/training

Pedagogy	Secondary	Between community and subject, community and rules, subject and rules *(unharmonised curriculum practices such as curriculum structuring, delivery [field facilitation and lecturing] and assessment).*	Questioning, analysis and modelling	Policy revisions and Orientation/ induction/training
		Between community and tools (*Group learning against individual learning, student-centred against field facilitator-centred learning).*		
		Between community and subject *(student-centred against field facilitator-centred learning).*		
	Primary	Within community (students') and within subjects (field facilitators') historical background) *(group learning against individual learning, student-centred against field facilitator-centred learning).*		Orientation/ induction/training
		Within the community (students' historical background) *(group learning against individual learning).*		
		Within the tools (f2f against ODL pedagogy).		Orientation/ induction/training in ODL study skills upon entry into the ODL programmes
Understanding the students	Secondary	Between community and subject *(prerequisite knowledge and skills both content and pedagogical)*.	Questioning, analysis and modelling	Orientation/ induction/training
	Primary	Within the community (within lecturers and students) *(prerequisite knowledge and skills both content and pedagogical)*.		Orientation/ induction/training
	Secondary	Between community and rules *(students gender divide).*		Revising students' admission policy

Credibility/identity/roles of field facilitators	Secondary Primary	Between object and rules, between community and rules. Within students	Questioning, analysis and modelling	Revision of field facilitator recruitment policy, orientation/ induction/training, field facilitator/lecturer collaboration/ coordination/ communication Orientation/ induction/training
Learning materials and the digital divide	Secondary Primary	Between tools and object, tools and subject, tools and community and tools and division of labour. Within the tools.	Questioning, analysis and modelling	Orientation/ induction/training Standardisation or moderation of tools
The nature of ODL not being sufficiently built into the larger university activity system	Secondary Primary	Between rules and community, rules and object, rules and division of labour and object and division of labour. Within the rules.	Questioning, analysis and modelling	Revision of university statutes or policies

While some of the model solutions fall within the jurisdiction of the field facilitation activity system itself, some are far beyond its control. Such solutions require the agency of the individuals who hold power and authority at the university to influence the transformation. Some are even beyond the university and would require government intervention. These are some of the limitations of the field facilitation activity system in as far as field facilitation transformation is concerned and such issues will be explained in the next concluding chapter (Chapter Seven).

6.7 Conclusion

This chapter has drawn out and discussed the contradictions in the field facilitation activity system, pointing out the possible expansive transformation of the activity system. It was evident that a number of contradictions prevent complementarity within the activity system and that this hinders the possibility of achieving the shared outcome on the field facilitation system enabling increased retention and throughput.

While some of these might be addressed within the activity system itself, such as training of field facilitators in student-centred pedagogy and the use of scaffolding to extend students' ZPD, most of the findings cannot be addressed within the activity system itself. "To transcend or resolve contradictions" (Engeström & Sannino, 2021, p. 10) and to move towards expansive possibilities in this requires a serious look at complexities that are beyond that illuminated through the second-generation model of CHAT. This is an issue that I deliberate on in more detail in Chapter Seven, the thesis conclusion.

CHAPTER SEVEN: CONCLUSION AND RECOMMENDATIONS

7.1 Introduction

In Chapter Six, I presented and discussed the main themes related to the expansive transformation of the field facilitation activity system. This chapter, Chapter Seven, is a summary of key findings of my research with reference to the three research questions (see Section 1.4). The chapter also provides recommendations targeting various stakeholders including myself, ODL practitioners within Mzuni and beyond, teacher education institutions, policy makers, planners, higher education institutions, donors, training and capacity building institutions particularly in non-traditional learning environments like this one and the general public. The chapter also discusses the limitations of the study, the possibilities for future study and new knowledge claims.

7.2 Key Findings

With respect to the three research questions, my study findings show that the research questions for the study have been answered. Provided below are the details showing how the research questions have been addressed. The first two research questions were answered in Chapter Five and the third research question was answered in Chapter Six.

The first research question was about the field facilitation strategies currently being used in the B.Ed Science programme. The study found that a range of approaches were being used. There was evidence that many of the field facilitators used student-centred approaches and created spaces in which students could engage in active learning through practice and formative feedback. However, this was not consistent across the data, and it seems that a fairly ad hoc approach to the pedagogy was used depending largely on the experiences and values of the individual field facilitator.

The data indicated issues with the materials available and limitations in the communication between lecturers and field facilitators that constrained the possibility of the activity system in meeting its object. There was evidence that the field facilitators made extensive use of WhatsApp in the absence of easy access to digital tools. The mirror data was not used much in the study as

the ideal CLWs were not possible, but it is clear that the mirror data offers much that could be used for staff development purposes for both the field facilitators and the lecturers.

The second question was about the effectiveness of these strategies. Here again there are great differences across the data with some students, lecturers and field facilitators indicating that the field facilitation activity system allowed for scaffolding of student learning and more opportunities for students to engage with the materials. However, in other cases, there was less optimistic reflection on the activity system. Overall, there was a general sense that this activity system was not meeting its full potential and that it could not contribute significantly to the shared object of enhancing learning and success which equally made the attainment of the expected outcome of improved retention and throughput difficult.

This would require significant engagement with the constraints within the activity system, such as the lack of awareness of the implications of ODL students' characteristics, ODL pedagogy, learning materials and digital divide, credibility/identity/roles of field facilitators and ODL not being sufficiently built into the larger university activity system. This was the response to the third research question on how the field facilitation strategy could be improved for enhanced learning experiences and success that would ultimately result in student retention and throughput as an expected outcome. Many of the constraints were, however, outside the activity system under study and required a consideration of the deep-seated historical contradictions in the university system. In response to research question three, the improvements needed, I discussed in Chapter Six the need to go beyond the limits of the specific activity system under study. To achieve the changes needed for field facilitation to meet its promise, there would need to be engagement with the university as a whole. This might even require new materials to be developed, better curriculation of field facilitation activities and structural changes in how the field facilitators are appointed and trained and how much time is allocated for their activities.

7.3 Limitations of the Study

Despite what I would mention as the successful execution of the study as evidenced in the study background, literature review, theory, methodology and the findings, there were a number of limitations, most of which I have already alluded to in the thesis but which I briefly revisit here.

7.3.1 Methodological limitation

Despite generating data from multiple sources including the CLWs, the use of virtual CLWs fell short of being a credible Change Laboratory tool. The Covid-19 context made the initial plans impossible to complete. I had to be flexible and adjust to the context and so sought to offer mirror data through WhatsApp conversations. While this elicited useful data that deepened my understanding of the activity system, the virtual CLWs through the social media application of WhatsApp could not enable deeper engagements among participants, particularly among lecturers. Efforts to bring about change within the activity system through WhatsApp conversations were limited. In addition, the interactions through texts mostly on WhatsApp at times led to miscommunications as some nonverbal cues which are equally valuable in communication were absent (Mwanda, 2022).

In addition, the non-involvement of some key individuals in academic governance and general leadership of Mzuni also limited the potential of the study to act as an instrument of change. For example, the absence of heads of departments in Science and Mathematics who service the Faculty of Education limited the potential to engage in the university or faculty wide changes that the data indicated were needed. The use of second-generation CHAT which focused on the field facilitation system separately from its connection to the larger university activity system was a significant limitation and one which I come back to later in regard to possible future research and Change Laboratory interventions. Such interventions would need to include the heads of departments as members of the ODL Steering Committee and even the top university leadership who have the authority to make decisions for the university.

7.3.2 Theoretical limitation

The second-generation Activity Theory as the theoretical lens underpinning my study was limited in authentically uncovering or surfacing the contradictions in the field facilitation activity system. It was assumed during the design and implementation of the study that the field facilitation activity system is a single bounded activity system, but the data rapidly revealed that many of the contradictions within the activity system related to issues outside of the field facilitation activity system. I will now discuss what the implications of this limitation are for future research.

7.4 Possibilities of Future Research

Taking the findings from the thesis forward, it will be important to study the lateral intersections across the boundaries (Larike et al., 2016), for example, between the field facilitation activity system and the campus-wide activity system. In third-generation studies, lateral interactions across the boundaries between participating activity systems become central. Change Laboratories may well be useful for Mzuni field facilitators at this point in regard to engaging with the mirror data about pedagogical issues, student-centred teaching/learning, ICT-supported field facilitation, student assessment and so on. But overall, most of the study findings suggest that for transformational learning to take place that will address the many contradictions in the activity system, the limited focus of second-generation CHAT would be insufficient.

The field facilitators as subjects do not have the authority or power to address many of the contradictions revealed in the data, such as the need for field facilitator training, clarity on progression rules, field facilitator recruitment and field facilitator payment issues. Even the lecturers, who form part of the community in the activity system discussed here, do not have institutional authority to bring about the changes in the field facilitation activity system that the study indicated as necessary. It therefore follows that the field facilitators and lecturers would not significantly impact transformational and expansive change in the field facilitation activity system.

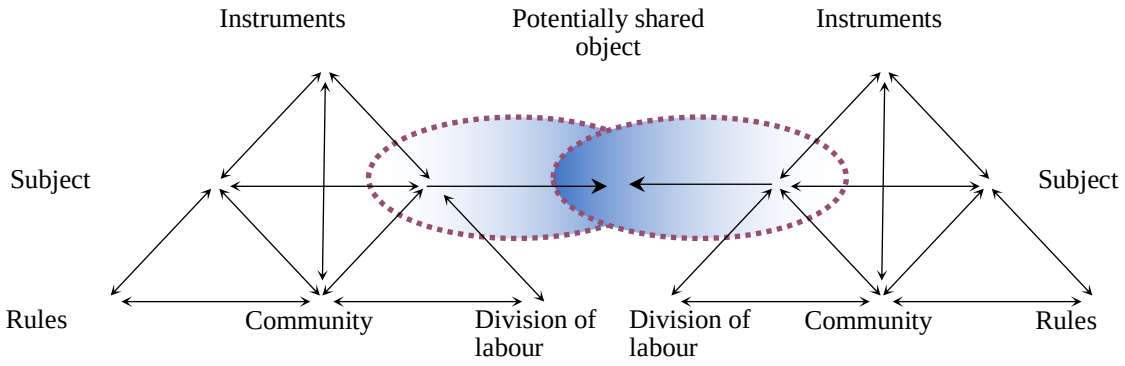


Figure 7.1: Third-generation CHAT

Third-generation CHAT is about interconnected activity systems. If used to take this study forwards, it would include the whole university including lecturers and university top management and leadership (the Mzuni council) because addressing numerous contradictions in the field facilitation activity system requires the agency of the entire university system. Specific examples of what is needed at this level and who would need the mirror data for Change Laboratories would have to include university decision-making bodies who have the ability to influence change, e.g. training for field facilitators, means of recruitment of field facilitators and policy revisions reflecting university dualism. Implementing CLWs at Mzuni would mean drawing in connected activity systems which have the power to actually implement the necessary changes.

Taking the study even further forwards, fourth-generation Activity Theory (an expanded version of the third generation) could unveil the contradictions in the field facilitation activity system that emerge from forces beyond the university. These might include policies of the Malawian Government and the Ministry of Education.

Figure 7.2: Fourth-generation Activity Theory

Fourth-generation Activity Theory remains true to Vygotsky's (1978) argument that the relationship between a human and an object is never direct but rather needs to be understood within the context of society and culture. However, it takes this further to connect the activity system with the global forces of its context as a necessary part of the analysis. In doing so, it particularly considers "runaway objects" (Engeström, 2009).

Complex runaway objects have broad societal ramifications, such as climate change or pandemics, and connect large numbers of activity systems across national borders (Engeström, 2009). Such objects tend to transcend the boundaries between the history of a specific activity, the history of a singular society, and the history of humankind. The emerging fourth generation of Activity Theory zooms in on heterogenous work coalitions aimed at resolving critical societal problems, or runaway objects, and creating sustainable alternatives to capitalism (Sannino, 2017, 2020; Sannino & Engeström, 2018). For example, issues of neoliberalism, massification and the knowledge economy as discussed earlier in Chapter Two have had an enormous influence on higher education globally and at Mzuni's field facilitation activity, in particular.

The current study which used second-generation Activity Theory did not seek to delve into the larger national and global forces and runaway objects and how they affect the activity system. There is a need for future research that addresses these, and my data suggests room for such future research. Globalisation, the digital divide, massification, neoliberalism and the notion of the knowledge economy have all had an impact on ODL provision in under-researched and resource-constrained contexts in the Global South.

The development of digital educational tools is an enabler to massification, neoliberalism and knowledge economy as universities through ODL have the ability to increase accessibility and equity to higher education. However, access to powerful knowledge is hampered by the digital infrastructural underdevelopment in developing countries such as the context of this study. This digital divide perpetuates epistemological injustice in resource-constrained contexts as students in such contexts are less likely to access the powerful knowledge which globalisation affords.

Digitally supported ODL provision in such contexts becomes an epistemological injustice as it is available only to the few.

Furthermore, the literature and this study's findings have revealed that the introduction of ODL academic programmes in pre-established conventional (f2f) institutions have brought conflicts in such institutions when introduction is not managed properly. Such conflicts have manifested in the learning outcomes of the academic programmes. This, therefore, points to the possible study of appropriate governance models or strategies in dual-mode universities, among several other leadership-related issues in such types of institutions. The introduction of ODL cannot simply entail keeping the educational status quo but now from a distance.

7.5 Conclusion

While many of the findings such as the need to review how field facilitators are appointed relate to the specifics of Mzuni, the contribution of the study goes far beyond this by contributing a detailed look at the nature of ODL in resource-constrained environments. There is very little literature on what ODL looks like in places where the affordances of digital technology are few. The study thus portrays the realities of ODL in resource constrained contexts particularly in Africa and beyond.

The study showed the enormous potential of field facilitation in enhancing learning and success that would support retention and throughput in ODL resource-constrained contexts particularly in the Global South. This is consistent with literature, most of which originates from the Global North that praises ODL as a strategy to broaden access to higher education. Broadening access is increasingly a concern in the Global South and ODL is often seen to be a key means by which to achieve this. However, in the context of this study, field facilitation as a learning support strategy did very little to enhance learning and success in Science and Mathematics, hence it was found ineffective and could not achieve the expected outcome of enhancing retention and throughput. This was due to systemic insensitivities which required collective solutions beyond the field facilitation and university wide activity systems. There is thus a need for ODL to be undertaken from a carefully planned and well-resourced position. Field facilitation offers great potential for scaffolding student access to the powerful knowledge of the curriculum in resource-constrained

contexts. However, it can only do this if all components of the activity system receive institutional support.

REFERENCES

Abercrombie, N., Hill, S., & Turner, B. S. (2006). *The Penguin dictionary of sociology*. Penguin Books.

Aguti, J. N. (2006). *University education for national development: Makerere University's dual mode experience.* https://www.academia.edu/96388546/Education_for_national_development_The_Makerere_University_dual_mode_experience

Akpan, B. (2020). Classical and operant conditioning—Ivan Pavlov; Burrhus Skinner. In *Science education in theory and practice* (pp. 71-84). Springer.

Aluede, O., Idogho, P. O., & Imonikhe, J. S. (2012). Increasing access to university education in Nigeria: Present challenges and suggestions for the future. *The African Symposium*, *12*(1), 3-13.

Anderson, C. (2010). Presenting and evaluating qualitative research. *American Journal of Pharmaceutical Education, 74*, 141. https://doi.org/10.5688/aj7408141

Anderson, R., Beavers, J., VanDeGrift, T., & Videon, F. (2003). Videoconferencing and presentation support for synchronous distance learning. In *33rd Annual frontiers in education* (Vol. 2) (pp. F3F-13). IEEE.

Anderson, T. (2003). Getting the mix right again: An updated and theoretical rationale for interaction. *The International Review of Research in Open and Distributed Learning*, *4*(2).

Anderson, T., & Dron, J. (2011). Three generations of distance education pedagogy. *International Review of Research in Open and Distributed Learning*, *12*(3), 80-97.

Anderson, T., & Dron, J. (2012). Learning technology through three generations of technology enhanced distance education pedagogy. *European Journal of Open, Distance and e-learning*. https://www.saide.org.za/resources/Library/Anderson,%20T%20-%20Learning%20Technology%20through%203%20Generations%20of%20Technology%20Enhanced%20DE%20Pedagogy.pdf

Annand, D. (1999). The problem of computer conferencing for distance-based universities. *Open Learning*, *14*(3), 47-52.

Archila, P. A., Gravier, G., Levy, L., Ortiz, B. T., Rodríguez, A., Wilches, L.,... & Restrepo, S. (2022). Using formal and informal formative assessment to support bilingual argument mapping in university bilingual science courses. *International Journal of Bilingual Education and Bilingualism*, *25*(9), 3420-3435.

Attewell, P., Lavin, D., Domina, T., & Levey, T. (2006). New evidence on college remediation. *The Journal of Higher Education*, *77*(5), 886-924.

Banda, F. K. (2012). *A study of learner support system for distance education at Domasi College of Education, Malawi: Implications for transformative trajectories* [Unpublished master's thesis]. South West University.

Bandura, A., & Walters, R. H. (1977). *Social learning theory* (Vol. 1). Englewood Cliffs.

Banihashem, S. K., & Aliabadi, K. (2017). Connectivism: Implications for distance education. *Interdisciplinary Journal of Virtual Learning in Medical Sciences*, *8*(3).

Bansal, G. (2016). Assessment, curriculum, pedagogy. *Journal of Educational Planning and Administration*, *67*.

Barrett, A., Kajamaa, A., & Johnston, J. (2020). How to … be reflexive when conducting qualitative research. *The Clinical Teacher*, *17*(1), 9-12.

Basharina, O. K. (2007). An activity theory perspective on student-reported contradictions in international telecollaboration. *Language Learning and Technology, 11*(2), 82-103.

Baxter, P., & Jack, S. (2008). Qualitative case study methodology: Study design and implementation for novice researchers. *The Qualitative Report*, *13*(4), 544-559. https://doi.org/10.46743/2160-3715/2008.1573

Beckmann, J. L., & Aluko, F. R. (2011). *Issues and challenges in education in Africa–the need for a 'new' teacher*. Distance Education and Teachers' Training in Africa (DETA).

Benson, A., Lawler, C., & Whitworth, A. (2008). Rules, roles and tools: Activity theory and the comparative study of e-learning. *British Journal of Educational Technology*, *39*(3), 456-467. https://doi.org/10.1111/j.1467-8535.2008.00838.x

Bentrovato, D., & Dzikanyanga, N. (2022). Knowledge, power and school history in post-independence Malawi: A critical analysis of curriculum change (1964-2022). *Yesterday and Today*, *27*, 91-116.

Blackler, F., Crump, N., & McDonald, S. (2000). Organizing processes in complex activity networks. *Organization*, *7*(2), 277-300.

Blin, M. (2022). Developing a connective student support framework for a resource-constrained ODL institution in Mauritius. In *Multimodal learning environments in Southern Africa* (pp. 95-118). Palgrave Macmillan.

Blunden, A. (2009). An interdisciplinary concept of activity. *Outlines: Critical Practical Studies*, *1*(1), 1-26. http://ojs.statsbiblioteket.dk/index.php/outlines/article/view/2119/1877

Bogdan, R. C., & Biklen, S. K. (2007). *Qualitative research for education: an introduction to theories and methods* (5th Ed.). Sage.

Bondie, R. S., Dahnke, C., & Zusho, A. (2019). How does changing "one-size-fits-all" to differentiated instruction affect teaching? *Review of Research in Education*, *43*(1), 336-362.

Boughey, C., & McKenna, S. (2016). Academic literacy and the decontextualised learner. *Critical Studies in Teaching and Learning (CriSTaL)*, *4*(2), 1-9.

Boughey, C., & McKenna, S. (2017). Analysing an audit cycle: A critical realist account. *Studies in Higher Education*, *42*(6), 963-975.

Boughey, C., & McKenna, S. (2021). *Understanding higher education: Alternative perspectives*. African Minds.

Boyraz, S., & Ocak, G. (2021). Connectivism: A literature review for the new pathway of pandemic driven education. *Int J Innov Sci Res Technol*, *6*(3), 1122-1129.

Brown, P., Lauder, H., Ashton, D., Yingje, W., & Vincent-Lancrin, S. (2008). Education, globalisation and the future of the knowledge economy. *European Educational Research Journal*, *7*(2), 131-156.

Brown, R., & Carasso, H. (2013). *Everything for sale? The marketisation of UK higher education.* Routledge.

Burns, M. (2023). *Distance education for teacher training: Modes, models and methods* (2nd Ed.). Education Development Center.

Canlas, D. B. (2016). *Investing in human capital for inclusive growth: Focus on higher education (No. 2016-02).* PIDS Discussion Paper Series.

Carr, N. (2010). *The shallows: What the Internet is doing to our brains*. Norton.

Caruth, G. D., & Caruth, D. L. (2013). Distance education in the United States: From correspondence courses to the Internet. *Turkish Online Journal of Distance Education*, *14*(2), 141-149.

Castells, M. (1996). *The information age: Economy, society and culture: The rise of the networked society (Vol. 1).* Blackwell.

Castells, M. (2015). *Networks of outrage and hope: Social movements in the Internet age*. John Wiley & Sons.

Castro, W. (2016, March). *An activity theory approach to study barriers of Faculty regarding technology integration in higher education*. 10th International Technology, Education and Development Conference. INTED.

Chakwera, E. W. (2011). *Maximising student support through cluster meetings in a distance teacher upgrading programme* [Unpublished master's thesis]. University of Pretoria.

Chakwera, E. W., & Saiti, F. (2005). *Training teachers through the distance mode: The experience of Domasi College of Education in Malawi.* http://www.col.org/pcf2/papers/chakwera.pdf

Chawinga, W. D., & Zozie, P. (2016). Information needs and barriers to information sources by open and distance learners: A case of Mzuzu University, Malawi. *South African Journal of Information Management*, *18*(1), 1-12.

Chetty, D. (2013). Connectivism: Probing prospects for a technology-centered pedagogical transition in religious studies. *Alternation*, *10*, 172-199.

Chibambo, M. (2009, September). How mobile phone technology can support open and distance learning: Malawi's own context. In *Collected conference papers and abstracts* (p. 125).

Chibambo, M. (2016). Scurrying for a successful Open and Distance Learning Model in Malawi: Prevalent issues and trends in distance education, *Journal of Arts International Refereed Research Journal, 42.*

Chibambo, M. I. (2023). *Epistemological access and injustices in higher education: the case of ODL in Malawi* [Unpublished doctoral dissertation]. University of Johannesburg.

Chibambo, M. I., & Jere, D. R. (2018). A critical examination of the challenges of teacher education through open and distance learning delivery mode in Malawi universities. *Journal of Emerging Trends in Educational Research and Policy Studies*, *9*(5), 229-236.

Chikunda, C. (2010). Assessing the level of gender awareness of science teachers: The case of Zimbabwe's two education districts. *African Journal of Research in Mathematics, Science and Technology Education*, *14*(3), 110-120. https://doi.org.10.1080/10288457.2010.10740695

Chikunda, C. (2013). *Exploring and expanding capabilities, sustainability and gender justice in science teacher education: Case studies in Zimbabwe and South Africa* [Unpublished doctoral dissertation]. Rhodes University.

Chikunda, C. (2014). Identifying tensions around gender-responsive curriculum practices in science teacher education in Zimbabwe: An activity theory analysis. *African Journal of Research in Mathematics, Science and Technology Education*, *18*(3), 264-275. https://doi.org/10.1080/10288457.2014.956409

Chimpololo, A. (2010). The prospects and challenges of open learning and distance education in Malawi. *International Journal of Educational and Pedagogical Sciences*, *4*(6), 618-623.

Chirwa, G., & Naidoo, D. (2014). Curriculum change and development in Malawi: A historical overview. *Mediterranean Journal of Social Sciences*, *5*(16), 336.

Chisoni, E. M. (2016). Searching for sustainable solutions in Improved Cook Stove practice in Malawi-a cultural historical activity theory approach. *Africa Insight*, *45*(4), 51-68.

Chivwara, N. (2013). *An analysis of the governance of higher education access in Malawi* [Unpublished master's thesis]. University of the Western Cape.

Clarence, S. (2021). *Turning access into success: Improving university education with legitimation code theory*. Routledge.

Coffield, F., Moseley, D., Hall, E., Ecclestone, K., & Coffield, F. (2004). *Learning styles and pedagogy in post-16 learning: A systematic and critical review*. Learning and Skills Research Centre.

Cohen, L., Manion, L., & Morrison, K. (2000). *Research methods in education* (5th ed.). Routledge.

Cohen, L., Manion, L., & Morrison, K. (2010). *Research methods in education* (6th ed.). Routledge.

Cohen, L., Manion, L., & Morrison, K. (2017). The ethics of educational and social research. In *Research methods in education* (pp. 111-143). Routledge.

Cole, M. (1988). Cross-cultural research in the sociohistorical tradition. *Human Development*, *31*(3), 137-157.

Cole, M., John-Steiner, V., Scribner, S., & Souberman, E. (1978). *Mind in society. Mind in society the development of higher psychological processes*. Harvard University Press.

Commonwealth of Learning. (2005). *Distance education and open learning in sub-Saharan Africa: A literature survey on policy and practice.* http://www.col.org/resources/publications/Pages/detail.aspx?PID=17

Corbin, J. M. & Strauss, A. L. (2007). *Basics of qualitative research grounded theory - procedures and techniques* (Translated by B. Mohammadi). Institute for Humanities and Cultural Studies.

Cornelius, S., & Higgison, C. (2000). *The tutor's role and effective strategies for online tutoring. Online Tutoring e-book.* Heriot-Watt University. http://otis.scotcit.ac.uk/onlinebook

Creswell, J. W. (2003). *Research design: Qualitative, quantitative and mixed methods*. Sage.

Creswell, J. W. (2007). *Qualitative inquiry and research* (2nd ed.). Sage.

Crozier, W. R. (2013). *Individual learners: Personality differences in education*. Routledge.

Daniel, J. S. (1996). *Mega-universities and knowledge media: Technology strategies for higher education*. Psychology Press.

Daniels, H. (2001). *Vygotsky and pedagogy*. Routledge.

Daniels, H. (2008). *Vygotsky and research.* Taylor and Francis Group.

Daniel, J. S., & Marquis, C. (2020). Interaction and independence: Getting the mixture right. In *Distance Education* (pp. 339-359). Routledge.

De Neve, D., & Devos, G. (2017). How do professional learning communities aid and hamper professional learning of beginning teachers related to differentiated instruction? *Teachers and Teaching*, *23*(3), 262-283.

Devi, B., Khandelwal, B., & Das, M. (2017). Application of Bandura's social cognitive theory in the technology enhanced blended learning environment. *International Journal of Applied Research*, *3*(1), 721-724.

Devkota, K. R. (2021). Inequalities reinforced through online and distance education in the age of COVID-19: The case of higher education in Nepal. *International Review of Education*, *67*(1), 145-165.

Dipitso, P. O. (2022). Low-income students, human development and higher education in South Africa: Opportunities, obstacles and outcomes by M. Walker, M. McLean, M. Mathebula & P. Mukwambo (2022). Cape Town, South Africa: African Minds. *Journal of Student Affairs in Africa*, *10*(2), 233-237.

Downes, S. (2019). Recent work in connectivism. *European Journal of Open, Distance and E-Learning*, *22*(2), 113-132.

Dron, J. (2006). The way of the termite: A theoretically grounded approach to the design of elearning environments. *International Journal of Web Based Communities*, *2*(1), 3-16.

Dron, J., & Anderson, T. (2009a). Lost in social space: Information retrieval issues in Web 1.5. *Journal of Digital Information*, *10*(2).

Dron, J., & Anderson, T. (2009b). How the crowd can teach. In S. Hatzipanagos & S. Warburton (Eds), *Handbook of research on social software and developing community ontologies* (pp. 1-17). IGI Global Information Science. www.igiglobal.com/downloads/excerpts/33011.pdf

Dzama, E. N. N. (2006). *Malawian secondary school students' learning of science: Historical background, performance and beliefs* [Unpublished doctoral dissertation]. University of the Western Cape.

Edwards, A. (2005). Let's get beyond community and practice: The many meanings of learning by participating. *Curriculum Journal*, *16*(1), 49-65.

Edwards, A. (2007). Relational agency in professional practice: A CHAT analysis. *An International Journal of Human Activity Theory*, *1*(3), 1-17.

Ejiwale, J. (2012). Facilitating teaching and learning across STEM Fields. *Journal of STEM Education: Innovations and Research*, *13*(3), 87-94).

Engeström, Y. (1987). *Learning by expanding: An activity theoretical approach to developmental research*. Orienta-Konsultit.

Engeström, Y. (1999). Expansive visibilization of work: An activity-theoretical perspective. *Computer Supported Cooperative Work (CSCW)*, *8*, 63-93.

Engeström, Y. (2001). Expansive learning at work: Toward an activity theoretical reconceptualization. *Journal of Education and Work*, *14*(1), 133-156. http://dx.doi.org/10.1080/13639080020028747

Engeström, Y. (2016). *Enriching the theory of expansive learning: Lessons from journeys toward co-configuration.* https://doi.org/10.1080/10749030701307689

Engeström, Y., & Sannino, A. (2010). Studies of expansive learning: Foundations, findings and future challenges. *Educational Research Review*, *5*(1), 1-24. https://doi.org/10.1016/j.edurev.2009.12.002

Engeström, Y., & Sannino, A. (2011). Discursive manifestations of contradictions in organizational change efforts. *Journal of Organizational Change Management, 24*(3), 368 – 387. http://dx.doi.org/10.1108/09534811111132758

Engeström, Y., & Sannino, A. (2021). From mediated actions to heterogenous coalitions: four generations of activity-theoretical studies of work and learning. *Mind, Culture, and Activity*, *28*(1), 4-23.

Engeström, Y., Miettinen, R., & Punamäki, R. L. (Eds.). (1999). *Perspectives on activity theory*. Cambridge University Press.

Evans, C., Rees, G., Taylor, C., & Fox, S. (2021). A liberal higher education for all? The massification of higher education and its implications for graduates' participation in civil society. *Higher Education*, *81*(3), 521-535.

Farhangi, S. (2018). Contribution to activity: a lens for understanding students' potential and agency in physics education. *Cultural Studies of Science Education*, *13*(3), 617-637. https://doi.org/10.1007/s11422-016-9792-y

Flyvbjerg, B. (2006). Five misunderstandings about case-study research. *Qualitative Inquiry*, *12*(2), 219-245.

Foot, K. A. (2001). Cultural-historical activity theory as practice theory: Illuminating the development of conflict-monitoring network. *Communication Theory*, *11*(1), 56-83.

Foot, K. A. (2014). Cultural-historical activity theory: Exploring a theory to inform practice and research. *Journal of Human Behavior in the Social Environment*, *24*(3), 329-347.

Freeman, S., Eddy, S. L., McDonough, M., Smith, M. K., Okoroafor, N., Jordt, H., & Wenderoth, M. P. (2014). Active learning increases student performance in science, engineering, and mathematics. *Proceedings of the National Academy of Sciences*, *111*(23), 8410-8415.

Garrison, D. R. (1997). Computer conferencing: The post-industrial age of distance education. *Open Learning*, *12*(2), 3-11.

Garrison, D. R., & Shale, D. (1987). Mapping the boundaries of distance education: Problems in defining the field. *American Journal of Distance Education*, *1*(1), 7-13.

Gasiewski, J. A., Eagan, M. K., Garcia, G. A., Hurtado, S., & Chang, M. J. (2012). From gatekeeping to engagement: A multicontextual, mixed method study of student academic engagement in introductory STEM courses. *Research in Higher Education*, *53*, 229-261.

Gentry, R., Sallie, A. P., & Sanders, C. A. (2013). Differentiated instructional strategies to accommodate students with varying needs and learning styles. *Online Submission*.

Gheyssens, E., Coubergs, C., Griful-Freixenet, J., Engels, N., & Struyven, K. (2020). Differentiated instruction: the diversity of teachers' philosophy and praxis to adapt teaching to students' interests, readiness and learning profiles. *International Journal of Inclusive Education*, 1-18.

Gilbert, A. (2017). Using Activity Theory to inform sessional teacher development: what lessons can be learned from tutor training models? *International Journal for Academic Development*, *22*(1), 56-69.

Gondwe, M., & Longnecker, N. (2015). Objects as stimuli for exploring young people's views about cultural and scientific knowledge. *Science, Technology, & Human Values*, *40*(5), 766-792.

Greenhow, C., Robelia, B., & Hughes, J. (2009). Learning, teaching, and scholarship in a digital age: Web 2.0 and classroom research: What path should we take now? *Educational Researcher*, *38*, 246-259.

Gürsakal, N., & Bozkurt, A. (2017). Identifying gatekeepers in online learning networks. *World Journal on Educational Technology: Current Issues*, *9*(2), 75-88.

Gyamera, G. O., & Burke, P. J. (2018). Neoliberalism and curriculum in higher education: A post-colonial analyses. *Teaching in Higher Education*, *23*(4), 450-467.

Hall, R. (2008). *Can higher education enable its learners' digital autonomy?* Paper presented at the LICK 2008 Symposium. https://www.2.napier.ac.uk/transform/LICK_proceedings/Richard_Hall.pdf

Hamamous, A., & Benjelloun, N. (2022). Impact of the use of the physics Crocodile Simulator in the teaching and learning of electricity in high school (Morocco). *International Journal of Information and Education Technology*, *12*(10).

Hamdy, H. (2015). One size does not fit all: Blended learning strategies in medical education. *Health Professions Education*, *1*(1), 65-66.

Hamm, C. M. (2003). *Philosophical issues in education: An introduction*. Routledge.

Hardman, J. (2008). Researching pedagogy: An activity theory approach. *Journal of Education*, *45*(1), 65-95.

Harris, J. B. (2014). TPCK in in-service education: Assisting experienced teachers' "planned improvisations". In *Handbook of technological pedagogical content knowledge (TPCK) for educators* (pp. 261-282). Routledge.

Hasan, H. M. (2007). A cultural-historical activity theory approach to users, usability and usefulness. In F. B. Tan, J. Thong & L. J. Janczewski (Eds.), *Pacific Asia Conference on Information Systems* (pp. 140-149). AIS.

Hedegaard, M. (1998). Situated learning and cognition: Theoretical learning and cognition. *Mind, Culture, and Activity*, *5*(2), 114-126.

Heydenrych, J. F., & Prinsloo, P. (2010). Revisiting the five generations of distance education: Quo vadis? *Progressio*, *32*(1), 5-26.

Hockett, J. A., & Doubet, K. J. (2021). Differentiated instruction. *Critical Issues and Practices in Gifted Education*, 157-168.

Holmberg, B. (2020). Guided didactic conversation in distance education. In *Distance education: International perspectives* (pp. 114-122). Routledge.

Isaacs, S., & Mohee, R. (2020). *Baseline situational analysis on Open Distance Learning (ODL) in Southern African Development Community (SADC) member states*. SADC.

Janks, H. (2014). Globalisation, diversity, and education: A South African perspective. *The Educational Forum, 78*(1), 8-25.

Jere, C. M. (2012). Improving educational access of vulnerable children in high HIV prevalence communities of Malawi: The potential of open and flexible learning strategies. *International Journal of Educational Development*, *32*(6), 756-763.

Johnston, J. P. (2020). Creating better definitions of distance education. *Online Journal of Distance Learning Administration*, *23*(2), 1-6.

Julkunen, I. (2011). Knowledge-production processes in practice research–outcomes and critical elements. *Social Work & Society*, *9*(1), 60-75.

Julkunen, I. (2014). Helsinki statement on social work practice research. *Interventions*, *14*(1), 71-88.

Kanuka, H., & Anderson, T. (1999). Using constructivism in technology-mediated learning: Constructing order out of the chaos in the literature. *Radical Pedagogy*, *2*(1). http://radicalpedagogy.icaap.org/content/issue1_2/02kanuka1_2.html

Kanwar, A., & Cheng, R. Z. (2017, March). Making open and distance learning inclusive: the role of technology. In *6th International Conference on Information and Communication Technology and Accessibility, Muscat, December* (Vol. 20).

Kaptelinin, V., & Nardi, B. A. (1997). Activity theory: Basic concepts and applications. In *CHI'97 extended abstracts on human factors in computing systems* (pp. 158-159).

Kayange, A. K. (2021). Crisis for higher education enrolment in Malawi. *International Journal for Infonomics (IJI)*, *14*(1), 2073-081.

Kazima, M., & Mussa, C. (2010). Equity and quality issues in mathematics education in Malawi schools. In *Mapping equity and quality in mathematics education* (pp. 163-176). Springer.

Keegan, D. (1995). *Distance education technology for the new millennium: Compressed video teaching.* https://eric.ed.gov/?id=ED389931

Keegan, D. (2013). Teaching and learning by satellite in a European virtual classroom. In *Open and distance learning today* (pp. 124-134). Routledge.

Keegan, D. J. (1980). On defining distance education. *Distance Education*, *1*(1), 13-36.

Kent, R. (1996). The World Bank and UNESCO on higher education. *International Higher Education, 4*.

Klykken, F. H. (2022). Implementing continuous consent in qualitative research. *Qualitative Research*, *22*(5), 795-810.

Kop, R., & Hill, A. (2008). Connectivism: Learning theory of the future or vestige of the past? *International Review of Research in Open and Distance Learning*, *9*(3).

Kotecha, P. (2012, June). *Higher education in the Southern African region: Current trends, challenges, and recommendations.* Presentation to the Extraordinary Meeting of Ministries of Higher Education and Training, Johannesburg, South Africa (Vol. 5).

Kumalo, S. H. (2018). Explicating abjection–Historically white universities creating natives of nowhere? *Critical Studies in Teaching and Learning*, *6*(1), 1-17. https://doi.org/10.14426/cristal.v6i1.132

Kusmaryono, I., & Kusumaningsih, W. (2021). Construction of students' mathematical knowledge in the zone of proximal development and zone of potential construction. *European Journal of Educational Research*, *10*(1), 341-351.

Kuswara, A. U. (2015). *Web 2.0 affordances to support collaborative learning in higher education* [Unpublished doctoral dissertation]. Macquarie University.

Laal, M., & Salamati, P. (2012), Lifelong learning; why do we need it? *Procedia - Social and Behavioral Sciences, 31*. https://doi.org/10.1016/j.sbspro.2011.12.073

Lange, L. (2017). 20 Years of higher education curriculum policy in South Africa. *Journal of Education (University of KwaZulu-Natal)*, *68*, 31-57.

Latour, B. (1993). *We have never been modern*. Harvard University Press.

Le Ha, P. (2014). The politics of naming: Critiquing "learner-centred" and "teacher as facilitator" in English language and humanities classrooms. *Asia-Pacific Journal of Teacher Education*, *42*(4), 392-405.

Lindley, D. S. (2014). *Can expansive (social) learning processes strengthen organisational learning for improved wetland management in a plantation forestry company, and if so, how? A case study of Mondi* [Unpublished doctoral dissertation]. Rhodes University.

Liu, T. C., Peng, H., Wu, W. H., & Lin, M. S. (2009). The effects of mobile natural-science learning based on the 5E learning cycle: A case study. *Journal of Educational Technology & Society*, *12*(4), 344-358.

Lotz-Sisitka, H., & Raven, G. (2004). Learning through cases: Adopting a nested approach to case-study work in the Gold Fields participatory course initiative. *Environmental Education Research, 10*(1), 67-87. https://doi.org/10.1080/1350462032000173715

Macdonald, H. I. (1999). The Commonwealth of Learning looking ahead to CHOGM 1999. *The Round Table*, *88*(352), 663-667

Mackiewicz, J., & Thompson, I. (2014). Instruction, cognitive scaffolding, and motivational scaffolding in writing center tutoring. *Composition Studies*, *42*(1), 54-78.

Mackness, J., Mak, S. F. J., & Wiliams, R. (2010). *The ideals and reality of participating in a MOOC.* Paper presented at the 7th International Conference on Networked Learning.

Maduekwe, E., & De Vries, W. (2019). Random spatial and systematic random sampling approach to development survey data: Evidence from field application in Malawi. *Sustainability*, *11*, 6899. https://www.org/10.3390/su11246899

Magunje, C., & Chigona, A. (2021). E-learning policy and technology-enhanced flexible curriculum delivery in developing contexts: A critical discourse analysis. *Critical Studies in Teaching and Learning*, *9*(2), 83-104. https://doi.org/10.14426/cristal.v9i2.447

Maina, G. E., & Maringe, F. (2020). Epistemological access in disadvantaged schools: A case study of flood-prone rural schools in Western Kenya. In *Inclusion as social justice* (pp. 14-35). Brill Sense.

Makarova, E., Aeschlimann, B., & Herzog, W. (2019). The gender gap in STEM fields: The impact of the gender stereotype of math and science on secondary students' career aspirations. In *Frontiers in education* (p. 60). Frontiers. https://doi.org/10. 60. 10.3389/feduc.2019.00060

Malawi National Statistics Office (NSO) (2018). Lilongwe, Malawi.

Maritim, E., Malingumu, W., & Chakwera, E. (2012). Enhancing open and distance learning capacity building in SADC region: The role and influence of SADC Centre of Specialisation in open and distance learning in teacher education. *Huria: Journal of the Open University of Tanzania*, *13*(2), 270-284.

Marshall, C., & Rossman, G. B. (2011). *Designing qualitative research* (5th ed.). Sage.

Marx, K. (1976). *The poverty of philosophy contained in the collected works of Karl Marx and Frederick Engels: Volume 6*. International Publishers.

McNeill, S., & Johnston, B. (2013). The digital university in the modern age: A proposed framework for strategic development. *Compass: Journal of Learning and Teaching*, *4*(7).

Masanja, V. G. (2010). *Increasing women's participation in science, mathematics and technology education and employment in Africa*. United Nations Division for the Advancement of Women (DAW, part of UN Women) and United Nations Educational, Scientific and Cultural Organization (UNESCO). https://www.un.org/womenwatch/daw/egm/gst_2010/Masanja-EP.8-EGM-ST.pdf

Masara, C. (2010). *Learning commercial beekeeping: Two cases of social learning in southern African community natural resources management contexts* [Unpublished doctoral dissertation]. Rhodes University.

Maton, K. (2014). Building powerful knowledge: The significance of semantic waves. In *Knowledge and the future of the curriculum: International studies in social realism* (pp. 181-197). Palgrave Macmillan UK.

Maxwell, J. A. (2005). *Qualitative research design: An interactive approach* (2nd ed.). Sage.

McCaughan, K. (2013). Barrows' integration of cognitive and clinical psychology in PBL tutor guidelines. *Interdisciplinary Journal of Problem-based Learning*, *7*(1), 11-23.

McKerlich, R., & Anderson, T. (2007). Community of inquiry and learning in immersive environments. *Journal of Asynchronous Learning Networks*, *11*(4). http://www.sloan-c.org/publications/jaln/v11n4/index.asp

McLoughlin, C., & Lee, M. J. W. (2008). The three p's of pedagogy for the networked society: Personalization, participation, and productivity. *International Journal of Teaching and Learning in Higher Education*, *20*(1), 10-27. http://www.isetl.org/ijtlhe/pdf/IJTLHE395.pdf.

Merriam, S. B. (2009). *Qualitative research: A guide to design and implementation*. Sage.

Mertens, D. M. (2008). *Transformative research and evaluation*. Guilford Press.

Milne, C. (2005). On being authentic: A response to "No thank you, not today": Supporting ethical and professional relationships in large qualitative studies. *Forum Qualitative Sozialforschung/Forum: Qualitative Social Research*, *6*(3). https://www.researchgate.net/publication/260748635_On_Being_Authentic_A_Response_to_No_thank_you_not_today_Supporting_Ethical_and_Professional_Relationships_in_Large_Qualitative_Studies

Mingst, K. (2020, September 1). *UNESCO*. https://www.britannica.com/topic/UNESCO

Ministry of Education, Science and Technology (MoEST). (2009). *National Education Sector Plan (2008 – 2017).* MoEST Publishing Unit.

Ministry of Education, Science and Technology (MoEST). (2016). *Education Sector Performance Report for 2015/16.* MoEST Publication Unit.

Ministry of Education, Sports and Culture. (2000). *Education sector: Policy and investment framework (PIF).* MoEST Publication Unit.

Mncube, V., Mutongoza, B. H., & Olawale, E. (2021). Managing higher education institutions in the context of COVID-19 stringency: Experiences of stakeholders at a rural South African university. *Perspectives in Education*, *39*(1), 390-409.

Moll, L. C. (1990). *Vygotsky and education: Instructional implications and applications of sociohistorial psychology*. Cambridge University Press. https://doi.org/10.1017/CBO9781139173674

Moore, S. (1971). Marx and the origin of dialectical materialism. *Inquiry*, *14*(1-4), 420-429.

Mosely, G., Wright, N., & Wrigley, C. (2018). Facilitating design thinking: A comparison of design expertise. *Thinking Skills and Creativity*, *27*, 177-189.

Moyo, J. (2015). *Graduate teachers' perceptions and experiences about the usefulness of the secondary school teacher education project of Domasi College of Education in enabling teachers to improve their teaching competences* [Unpublished master's thesis]. University of Sussex.

Mpolomoka, D. L., Chikopela, R., Muvombo, M. M., Matimba, M. N., Banda, S., Nherera, S., & Sampa, R. L. (2022). Portfolios of distance education students in selected colleges and Universities in Zambia. *Asian Journal of Education and Social Studies*, *29*(4), 9-19.

Msiska, F. G. W., Chimpololo, A., Liwambano, P. N., Maere, C., Mbendera, A., Phiri, D. D., & Yambeni, A. M. (2013). *Audit study to determine the effectiveness of open, distance and e-learning delivery mode in broadening and increasing access to education and training in Malawi.* Commonwealth of Learning.

Mukasa-Lwanga, T. N. (2018). *The use of technology for improving throughput rates in an ODL context by lecturers in the School of Computing* [Unpublished doctoral dissertation]. University of South Africa.

Mukute, M. (2010). *Exploring and expanding learning processes in sustainable agriculture* [Unpublished PhD thesis]. Rhodes University.

Mukute, M., & Lotz-Sisitka, H. (2012). Working with cultural-historical activity theory and critical realism to investigate and expand farmer learning in Southern Africa. *Mind, Culture, and Activity*, *19*(4), 342-367.

Mundy, K., & Madden, M. (2010). UNESCO and higher education: Opportunity or impasse? In *International organizations and higher education policy* (pp. 58-75). Routledge.

Murphy, E., & Rodríguez-Manzanares, M. (2008). Using activity theory and its principle of contradictions to guide research in educational technology. *Australasian Journal of Educational Technology, 24*. https://doi.org/10.14742/ajet.1203

Musingafi, M. C., Mapuranga, B., Chiwanza, K., & Zebron, S. (2015). Challenges for open and distance learning (ODL) students: Experiences from students of the Zimbabwe Open University. *Journal of Education and Practice*, *6*(18), 59-66.

Mutambo, N. H., Aguti, J. N., & Winterbottom, M. H. (2018). Effectiveness of study centres in supporting open and distance learning at Makerere University. *Makerere Journal of Higher Education*, *10*(1), 45-59.

Muyinda, P. B. (2012). Open and distance learning in dual mode universities: A treasure unexploited. In *International perspectives of distance learning in higher education* (pp. 33-50). http://dx.doi.org/10.5772/32879

Muyinda, P. B., Lubega, J. T., & Lynch, K. (2009). A model for scaffolding traditional distance learners in Africa for constructivist online learning. *Makerere Journal of Higher Education*, *2*.

Mwanda, Z. (2022). Text, voice-notes, and emojis: Exploring the use of WhatsApp as a responsive research method for qualitative studies. *Critical Studies in Teaching and Learning (CriSTaL), 10*(1), 78-92.

Mzuzu University Academic Office. (2018). Mzuzu, Malawi.

Mzuzu University Annual Report. (2015). https://vdocuments.mx/annual-report-20132014-mzuzu-university-anual-report1pdf-foreword-this-is.html?page=1

Mzuzu University Open and Distance Learning Steering Committee. (2014). Minutes of meetings held at Mzuzu University, Malawi.

Mzuzu University Act and Statutes. (1997). https://ict.mzuni.ac.mw/wp-content/uploads/2021/09/STATUTES.pdf

Nage-Sibande, B., & Morolong, B. L. (2018). A trend analysis of opportunities and challenges of open and distance learning provision in dual-mode institutions. *Distance Education*, *39*(4), 495-510.

Nage-Sibande, B., & Van Vollenhoven, W. (2012). ODL-answer to access to tertiary education in Southern Africa? *Progressio*, *34*(2), 33-47.

Nalivata, P. C., Kapute, F., Wiyo, K., & Uta, J. (2015). *Understanding the role of public universities in community development in Malawi: unlocking the nature of interactions*. HSRC.

Nampota, D., Thompson, J., & Wikeley, F. (2009). The development of human capacity in Malawi: The role of science and technology. *International Review of Education*, *55*, 59-74.

Nampota, T. (2015). *Emergent governance practices in the University of Malawi following reform implementation from 1997 to 2013* [Unpublished doctoral thesis]. Rhodes University.

National Council for Higher Education. (2015). *Minimum standards for higher education in Malawi.* http://www.nche.ac.mw/downloads/minimum%20standards.pdf

Nava, C. M. E., Cortezano, G. P., Yazon, A. D., Manaig, K. A., & Tesoro, J. F. B. (2022). Lived experiences of English teachers in integrating Bloom's digital taxonomy on their differentiated instruction practices: A phenomenological study. *Journal of English as a Foreign Language Teaching and Research*, *2*(2), 30-43.

Nazihovna, Y. G. (2023). Modelling physical processes with the program Crocodile Physics. *Finland International Scientific Journal of Education, Social Science & Humanities*, *11*(1), 825-839.

Neves, J., & Hillman, N. (2017). Student academic experience survey. *Higher Education Policy Institute and Higher Education Academy*, *12*, 47-48.

Newman, D., Griffin, P., & Cole, M. (1989). *The construction zone: Working for cognitive change in school.* Cambridge University Press.

Ngubane-Mokiwa, S., & Letseka, M. (2015). Shift from open distance learning to open distance e-learning. *Open distance learning (ODL) in South Africa*, *129*.

Nussbaum, D. (2012). An overview of cultural historical activity theory (CHAT) use in classroom research 2000 to 2009. *Educational Review*, *64*(1), 37-55.

Obioha, M. F., & Ndidi, U. B. (2011). Administrative problems of open distance education in Nigeria. A case study of National Open University of Nigeria. *Journal of Educational and Social Research*, *1*(5), 89-97.

Oleksiyenko, A., & Ruan, N. (2019). Intellectual leadership and academic communities: Issues for discussion and research. *Higher Education Quarterly*, *73*(4), 406-418.

Onyibor, K., Bah, S. İ., & Tomiwa, A. (2018). Aid-growth relationship: evidence from a co-integration analysis for the five poorest countries of the world. *LAÜ Sosyal Bilimler Dergisi*, *9*(2), 121-137.

Oztok, M. (2014). *Social presence and social absence: Socio-cultural production of self in online learning environments*. AoIR Selected Papers of Internet Research.

Pachai, B. (1973). *Malawi: The history of the nation*. Longman.

Palmer, L., Levett-Jones, T., & Smith, R. (2018). First year students' perceptions of academic literacies preparedness and embedded diagnostic assessment. *Student Success, 9*(2), 49-62.

Pappano, L. (2012). The year of the MOOC. *The New York Times*, *2*(12).

Patton, M. Q. (2002). *Qualitative research and evaluation methods* (3rd ed.). Sage.

Peal, D., & Wilson, B. G. (2001). Activity theory and web-based training. In *Web-based training* (pp. 147-154). Routledge.

Pedersen, C. S. (2018). The UN sustainable development goals (SDGs) are a great gift to business! *Procedia Cirp*, *69*, 21-24.

Perraton, H. (2020). A theory for distance education. In *Distance education: International perspectives* (pp. 34-45). Routledge.

Peter Mutharika, President of the Republic of Malawi. (2016).

Phillips, S. (2002). Social capital, local networks and community development. In C. Rakodi & T. Lloyd-Jones (Eds), *Urban livelihoods: A people-centred approach to reducing poverty*. Earthscan.

Pinxten, M., Van Soom, C., Peeters, C., De Laet, T., & Langie, G. (2019). At-risk at the gate: prediction of study success of first-year science and engineering students in an open-admission university in Flanders—any incremental validity of study strategies? *European Journal of Psychology of Education*, *34*, 45-66.

Postholm, M. B. (2019). The teacher educator's role as enacted and experienced in school-based development. *Teachers and Teaching*, *25*(3), 320-333.

Pozas, M., Letzel, V., & Schneider, C. (2020). Teachers and differentiated instruction: exploring differentiation practices to address student diversity. *Journal of Research in Special Educational Needs*, *20*(3), 217-230.

Pucciarelli, F., & Kaplan, A. (2016). Competition and strategy in higher education: Managing complexity and uncertainty. *Business Horizons*, *59*(3), 311-320.

Qureshi, F. H., & Khawaja, S. (2021). The growth of private higher education: An overview in the context of liberalisation, privatisation and marketisation. *European Journal of Education Studies*, *8*(9).

Rambe, P., & Mawere, M. (2011). Gibbons straddles the Mozambican public education system: Critical literacy challenges and moral dilemmas in Mozambican new curriculum. *International Journal for Educational Integrity*, *7*(1).

Ramnarain, U., Dlamini, T., Bansal, G., & Dhurumraj, T. (2022). Life Sciences teachers' practices of informal formative assessment in inquiry-based teaching. *International Journal of Science Education*, *44*(18), 2745-2762.

Rantavuori, J., Engeström, Y., & Lipponen, L. (2016). *Learning actions, objects and types of interaction: A methodological analysis of expansive learning among pre-service teachers.* Frontline Learning Research.

Reigeluth, C. M. (2004, April). *Chaos theory and the sciences of complexity: Foundations for transforming education.* Annual meeting of the American Educational Research Association, San Diego, CA.

Reinking, A., & Martin, B. (2018). The gender gap in STEM fields: Theories, movements and ideas to engage girls STEM environments. *Journal of New Approaches in Educational Research, 7*(2), 148-153. https://doi.org/10.7821/naer.2018.7.271.

Robins, A. V., Margulieux, L. E., & Morrison, B. B. (2019). Cognitive sciences for computing education. In *The Cambridge handbook of computing education research* (pp. 231-275). Cambridge University Press.

Ross, L. E. (2017). An account from the inside: Examining the emotional impact of qualitative research through the lens of "insider" research. *Qualitative Psychology*, *4*(3), 326.

Sachs, J. D. (2012). From millennium development goals to sustainable development goals. *The Lancet*, *379*(9832), 2206-2211.

Southern African Development Community. (2004). *Protocol on Education and Training*. SADC.

Saka, Y., Southerland, S., & Brooks, J. (2009). *Becoming a member of a school community while working toward science education reform: Teacher induction from a Cultural Historical Activity Theory (CHAT) perspective.* https://doi.org/10.1002/sce.20342

Sannino, A. (2020). Enacting the utopia of eradicating homelessness: Toward a new generation of activity-theoretical studies of learning. *Studies in Continuing Education*, *42*(2), 163-179.

Sannino, A., & Engeström, Y. (2017). Co-generation of societally impactful knowledge in Change Laboratories. *Management Learning*, *48*(1), 80-96.

Sannino, A., & Engeström, Y. (2018). Cultural-historical activity theory: Founding insights and new challenges. *Cultural-historical Psychology*, *14*(3), 43-56. https://doi.org/10.17759/chp.2018140304

Sannino, A., Engeström, Y., & Lemos, M. (2016). Formative interventions for expansive learning and transformative agency. *Journal of the Learning Sciences*, *25*(4), 599-633.

Saucerman, J., & Vasquez, K. (2014). Psychological barriers to STEM participation for women over the course of development. *Adultspan Journal*, *13*(1), 46-64.

Sawchuck, P. H., Duarte, N., & Elhammoumi, M. (2006). *Critical perspectives on activity.* Cambridge University Press.

Saykili, A. (2018). Distance education: Definitions, generations and key concepts and future directions. *International Journal of Contemporary Educational Research*, *5*(1), 2-17.

Schuh, K. L., Van Horne, S., & Russell, J. E. (2018). E-textbook as object and mediator: interactions between instructor and student activity systems. *Journal of Computing in Higher Education, 30*, 298-325.

Seaman, J., & Gingo, M. (2011). Lev Vygotsky: Experiential education—A view from the future. In *Sourcebook of experiential education* (pp. 171-179). Routledge.

Segoe, B. (2014). *Peer support: The traits and perceptions of Open Distance Learning (ODL) students*. Bulgarian Comparative Education Society.

Sewart, D. (1993). Student support systems in distance education. *Open Learning: The Journal of Open, Distance and e-Learning*, *8*(3), 3-12.

Shay, S. (2013). Conceptualizing curriculum differentiation in higher education: a sociology of knowledge point of view. *British Journal of Sociology of Education*, *34*(4), 563-582.

Shenton, A. K. (2004). Strategies for ensuring trustworthiness in qualitative research projects. *Education for Information*, *22*(2), 63-75.

Sherry, L. (2000). The nature and purpose of online discourse: A brief synthesis of current research as related to the WEB project. *International Journal of Educational Telecommunications*, *6*(1), 19-51.

Siemens, G. (2005a). A learning theory for the digital age. *Instructional Technology and Distance Education*, *2*(1), 3-10. http://www.elearnspace.org/Articles/connectivism.htm.

Siemens, G. (2005b). *Connectivism: Learning as network-creation*. http://www.elearnspace.org/Articles/networks.htm.

Siemens, G. (2007). Connectivism: Creating a learning ecology in distributed environments. In T. Hug (Ed.), *Didactics of microlearning: Concepts, discourses and examples*. Waxmann Verlag.

Siemens, G., & Conole, G. (2011). Connectivism: Design and delivery of social networked learning. *International Review of Research in Open and Distance Learning*, *12*(3).

Simango, B. (2016). *Leadership styles employed at Zambia's colleges of education* [Unpublished doctoral dissertation]. University of South Africa.

Simonson, M., Zvacek, S. M., & Smaldino, S. (2019). *Teaching and learning at a distance: Foundations of distance education* (7th ed.). Routledge.

Simpson, M., & Anderson, B. (2012). History and heritage in open, flexible and distance education. *Journal of Open, Flexible, and Distance Learning*, *16*(2), 1-10.

Smets, W., & Struyven, K. (2020). A teachers' professional development programme to implement differentiated instruction in secondary education: How far do teachers reach? *Cogent Education*, *7*(1), 1742273.

Smidt, H., Thornton, M., & Abhari, K. (2017). The future of social learning: A novel approach to connectivism. *Proceedings of the 50th Hawaii international conference on system sciences*.

Sogo, O., & Jeremiah, K. (2018). Differentiated instruction: Inclusiveness of learning styles in a business studies classroom–a case study of a selected public senior secondary school in Botswana. *European Journal of Social Sciences Studies*, *3*(4). https://oapub.org/soc/index.php/EJSSS/article/view/486/1067

Spinuzzi, C., & Guile, D. (2019, July). Fourth-generation activity theory: an integrative literature review and implications for professional communication. 2*019 IEEE international professional communication conference (ProComm)* (pp. 37-45). IEEE.

Stake, R. E. (2013). *Multiple case study analysis*. Guilford press.

Stake, R. E. (2005). Qualitative case study. In N. K. Denzin & Y. S. Lincoln (eds), *The Sage handbook of qualitative research* (pp. 443-466). Sage.

Stetsenko, A. (2005). Activity as object-related: Resolving the dichotomy of individual and collective planes of activity. *Mind, Culture, and Activity*, *12*(1), 70-88.

Stetsenko, A. P. (2020). Critical challenges in cultural-historical activity theory: The urgency of agency. *Cultural-Historical Psychology*, *16*(2), 5-18.

Subotzky, G., & Prinsloo, P. (2011). Turning the tide: A socio-critical model and framework for improving student success in open distance learning at the University of South Africa. *Distance Education*, *32*(2), 177-193.

Suri, H. (2020). Ethical considerations of conducting systematic reviews in educational research. In *Systematic reviews in educational research: Methodology, perspectives and application* (pp. 41-54). Routledge.

Surowiecki, J. (2005). *Independent individuals and wise crowds*. https://www.itc.conversationsnetwork.org/shows/detail468.html

Tait, A. (2000). Planning student support for open and distance learning. *Open learning: The Journal of Open, Distance and e-Learning*, *15*(3), 287-299.

Tait, A. (2014). From place to virtual space: Reconfiguring student support for distance and e-learning in the digital age. *Open Praxis*, *6*(1), 5-16.

Tangney, S. (2014). Student-centred learning: A humanist perspective. *Teaching in Higher Education*, *19*(3), 266-275.

Tembo, K. A., & Mwale, C. G. (2019). Expanding access to higher education in public universities through open and distance learning (ODL) in Malawi: Quality issues. *International Journal of Engineering Science and Management (IJESM)*, *1*(3), 88-96.

Tenebe, V. A., & Ogidan, R. (2013). The use of learner support services for the development of distance learning: The approach of National Open University of Nigeria.

Theng, L. F., & Mai, N. (2013, October). Students' perceptions of a constructivist classroom: A collaborative learning approach. *2013 IEEE 63rd Annual Conference International Council for Education Media (ICEM)* (pp. 1-11). IEEE.

Tilak, J. B. G. (2006). Higher education between the state and the market. In *Knowledge, power and dissent: Critical perspectives on higher education and research in knowledge society* (pp. 235-254). Sage.

Toma, J. D. (2011). Approaching rigor in applied qualitative research. In *The SAGE handbook for research in education: Pursuing ideas as the keystone of exemplary inquiry* (pp. 263-281). Sage.

Tomlinson, C. A. (2014). *The differentiated classroom: Responding to the needs of all learners*. ASCD.

Tomlinson, C. A. (2017). Differentiated instruction. In *Fundamentals of gifted education* (pp. 279-292). Routledge.

Trowler, P. (2011). *Researching your own institution: Higher education*. British Educational Research Association Online Resource.

United Nations. (2015). *Sustainable development agenda.* https://www.un.org/sustainabledevelopment/ development-agenda/

Vantieghem, W., Roose, I., Gheyssens, E., Griful-Freixenet, J., Keppens, K., Vanderlinde, R.,... & Van Avermaet, P. (2020). Professional vision of inclusive classrooms: A validation of teachers' reasoning on differentiated instruction and teacher-student interactions. *Studies in Educational Evaluation*, *67*, 100912.

Virkkunen, J., & Newnham, D. S. (2013). Preparing a change laboratory intervention. In *The change laboratory: A tool for collaborative development of work and education* (pp. 61-78). Pearson.

Vygotsky, L. S. (1978). *Mind in society: Development of higher psychological processes*. Harvard University Press.

Walsh, A. (2005). *The Tutor in PBL; a novice's guide*. McMaster University.

Wandiga, S. O. (1994). *Education and science in Africa: Possible ways of improvement in the next decade.* International Commission on Education for the Twenty-First Century, Working Group on Education and Science (Paris, France, January 10-11).

Wardle, E. A. (2004). Can cross-disciplinary links help us teach "academic discourse" in FYC. *Across the Disciplines*, *1*, 1-17.

Warnick, B. (2008). *Imitation and education: A philosophical inquiry into learning by example*. SUNY Press.

Wegerif, R. (2007). *Dialogic education and technology*. Springer.

Widder, N. (2004). Foucault and power revisited. *European Journal of Political Theory*, *3*(4), 411-432.

Williams, G. (2016). Higher education: Public good or private commodity? *London Review of Education*, *14*(1), 131-142.

Wood, L. N., & Breyer, Y. A. (2017). Success in higher education. In *Success in higher education* (pp. 1-19). Springer.

World Health Organization (WHO). (2020). *Coronavirus Disease (COVID-19) Advice for the Public.* http://www.who.int/emergencies/diseases/novel-coronavirus 2019/adviceforpublic

Yamagata-Lynch, L. C. (2007). Confronting analytical dilemmas for understanding complex human interactions in design-based research from a cultural—historical activity theory (CHAT) framework. *The Journal of the Learning Sciences*, *16*(4), 451-484.

Yaroshevsky, M. (1989). *Lev Vygotsky*. Progress Publishers.

Yin, R. K. (1981). The case study as a serious research strategy. *Knowledge*, *3*(1), 97-114.

Young, M. (2008). From constructivism to realism in the sociology of the curriculum. *Review of Research in Education*, *32*(1), 1-28.

Young, M., & Muller, J. (2013). On the powers of powerful knowledge. *Review of Education*, *1*(3), 229-250.

Zairul, M. (2020). A thematic review on student-centred learning in the studio education. *Journal of Critical Reviews*, *7*(2), 504-511.

Zavershneva, E. (2014). The problem of consciousness in Vygotsky's cultural-historical psychology. In *The Cambridge handbook of cultural-historical psychology* (pp. 63-97). Cambridge University Press.

Zozie, P. A. M. (2020). *Integrating e-learning technologies into conventional teaching and learning in the school and higher education system with scarce resources: a case study of Mzuzu University* [Unpublished doctoral dissertation]. University of Glasgow.

APPENDICES

Appendix 1: Models of distance education (pedagogical perspectives)

	Correspondence Model	Audio-based Models	Televisual Models	Computer-based Multimedia Models	Web-based Models	Mobile Models
Key features	The printing press and books – correspondence – mass media and technologies	Progress in media recording, film, animation, radio and television – mass media and technologies	Multimedia, computer animation and computer-assisted learning and telematics (telephony) – interactive content	Video conferencing, audio-graphics, the Internet and WWW – sharing of resources, asynchronous and live communication – integration of media and technology for multiple platforms (freedom to select) – student and teacher options	Video conferencing, audio-graphics, the Internet and WWW – sharing of resources, asynchronous and live communication – integration of media and technology for multiple platforms (freedom to select) – learner and teacher options – the rise of Web 2 technologies	Video conferencing, audio-graphics, the Internet and WWW – sharing of resources, asynchronous and live communication – integration of media and technology for multiple platforms (freedom to select) – learner and teacher options – the rise of Web 2 technologies
Pedagogy	Behaviourism (largely transmission of information)	Behaviourism/ cognitivism (still dominated by transmission of information)	Behaviourism/ cognitivism/ constructivism	Behaviourism/ cognitivism/ constructivism/social constructivism or constructionism/ enactivism/ connectivism	Behaviourism/ cognitivism/ constructivism/social constructivism	Behaviourism/ cognitivism/ constructivism/ social constructivism
Curriculum	Knowledges formulated and sanctioned by the powerful elite and embedded in gender, class,	Curricula formulated in different disciplines and embedded in gender, class,	Curricula formulated in different disciplines and embedded in gender, class,	While disciplines and university knowledge still remain paramount, open educational resources, the	As more and more knowledge producers (formal, informal and self-publishing) enter the market, the curricula increasingly	As more and more knowledge producers (formal, informal and self-publishing) enter the market, the curricula increasingly

	caste, and race/tribal assumptions and relations. The rise of the modern university and the development of the different disciplines. Mode 1 knowledge production	caste, and race/tribal assumptions and relations. The discipline becomes the ruling mantra. Mode 1 knowledge production	caste, and race/tribal assumptions and relations. Mode 1 knowledge production	corporate university, and other sites of knowledge production are increasingly impacting on the curriculum. The curriculum is moving beyond mode 1 and mode 2 knowledge and morphing into mode 3 knowledge	become open and fluid. Open educational resources and the use of YouTube and other social technologies are changing the nature of knowledge, the curriculum and the validation of knowledge	become open and fluid. Open educational resources and the use of YouTube and other social technologies are changing the nature of knowledge, the curriculum and the validation of knowledge
Content owner	Universities	Universities	Universities	Universities and global community (dominated by so-called First-World content)	Universities and global community	Universities and global community
Interaction	Content based and dominated by limitations of print technology – self-pacing – mass delivery of Distance Education (DE)	Content based with limited interaction – mass delivery of DE and controlled access based on gender, class/caste, culture and age	Mostly asynchronous with limited interaction – mass delivery of DE – computer-aided instruction – computer-assisted learning	Content starting to move away from the university – asynchronous and synchronous interaction – mass delivery becomes problematic and demands for interaction challenge ICTs	Content starting to move away from the university – asynchronous and synchronous interaction – mass delivery becomes problematic and demands for interaction challenge ICTs	Content starting to move away from the university – asynchronous and synchronous interaction – mass delivery becomes problematic and demands for interaction challenge ICTs
Medium	Text and images – also the advent of film	Text, images, sound and video (film) – the start	Text, images, sound, video,	Text, images, sound and video	Text, images, sound and video	Text, images, sound and video

		of instructional television	instructional and live television			
Production	Printing press, manual design and recording	Printing press, sound and video/ film recording, manual and computer design/ programming	Printing press, sound and video/film recording and computer design/ programming	Mail system/television/ telephone/computers/ video and sound playback – equipment – computers starting to become a generic device and WWW (Internet) as a generic platform	Printing press, sound and video/film recording and computer design/ programming/user involvement	Printing press, sound and video/ film recording and computer design/ programming/user involvement
Storage	Books and letters	Recordings – audio cassettes and video cassettes	Recordings – audio cassettes and video cassettes – storage on disks	Text, images, sound and video	Digital storage media (CD, DVD, memory sticks, central servers, hard drives, etc.)	Digital storage media (CD, DVD, memory sticks, central servers, hard drives, etc.)
Delivery	Mail system	Mail system/television/ telephone/sound playback equipment	Mail system/television/ telephone/ computers/video and sound playback equipment – first computers used to send batches of data	Mail system/television/ telephone/computers/ video and sound playback – equipment – computers starting to become a generic device and WWW (Internet) as a generic platform	Mail system/television/ telephone/computers/ video and sound playback – equipment – computers starting to become a generic device and WWW (Internet) as a generic platform	Mail system/television/ telephone/computers/ video and sound playback – equipment – computers starting to become a generic device and WWW (Internet) as a generic platform, popularisation of social media

Appendix 2: Student consent participation form

Student participation consent form I _____ Registration Number _____was requested by Robert Kalima, a PhD student at Rhodes University in South Africa to participate in his PhD research project. I accept the request to participate in this research project. My participation will be both on campus during module orientation sessions and off campus during field facilitation sessions. On-campus involvement will require me to participate in a survey and CLWs. Off-campus participation will require me to participate in focus group interviews. My participation is voluntary and should I feel like not participating in the research project, I will be free to do so at any time without any negative consequences on my academic career. Research background It has been a tradition that Science and Mathematics students have had it difficult to persist to graduation in higher education institutions throughout the world. This has particularly been worse in sciences and mathematics. This phenomenon hasn't spared such category of students in Malawi. Even though Malawi Government has made a deliberate policy of making higher education accessible by officially accepting and adopting ODL as an alternative route to higher education, cases of student drop out in Science and Mathematics have persistently been high. This has resulted in shortage of Science and Mathematics teachers in Malawian secondary schools. The situation has been made worse by the recent curriculum review in secondary school education system where Science and Mathematics have been made core subjects. It is against this background that this study attempts to explore academic support strategies to Science and Mathematics students under ODL mode of delivery at Mzuzu University in Malawi. I strongly believe that my participation in this research will contribute towards the improvement of Science and Mathematics learning and teaching in higher education sector in Malawi and beyond.

Yours sincerely,

_____ Signed _____ Date

Appendix 3: Field facilitator consent participation form

I_____ Field Facilitator for _____Field Facilitator site accept to participate in a PhD research project for Robert Kalima, a PhD student at Rhodes University in South Africa. I accept my participation may be both on campus and off campus or off campus only during field facilitation sessions. On campus involvement will require me to participate in a workshop (Change Laboratory workshop). This will involve discussions on how best we could support Science and Mathematics students at Mzuzu University studying via ODL mode of study. Off campus involvement which will take place at field facilitation site (satellite centre) where I facilitate student learning, will require me to be involved in focus group interviews. Should I feel like not participating in the research project, I will be free to do so without any negative consequences on my work. Research background It has been a tradition that Science and Mathematics students have had it difficult to persist to graduation in higher education institutions throughout the world. This phenomenon hasn't spared such category of students in Malawi. Even though Malawi Government policy has made a deliberate policy of making higher education accessible by officially accepting and adopting ODL as an alternative route to higher education, cases of student drop out in Science and Mathematics have persistently been high and the situation is particularly worse in ODL programmes. This has resulted in shortage of Science and Mathematics teachers in Malawian secondary schools. The situation has been made worse by the recent curriculum review in secondary school education system where Science and Mathematics have been made core subjects. It is against this background that this study attempts to explore academic support strategies to Science and Mathematics students under ODL mode of delivery at Mzuzu University in Malawi. I believe my participation in this research project will contribute positively towards the improvement of higher education Science and Mathematics teaching and learning.

Yours sincerely,

_____ Signed _____ Date

Appendix 4: Lecturer participation consent form

I _____, a lecturer in _____acknowledge being requested by Robert Kalima, a PhD student at Rhodes University in South Africa to participate in his research project. I accept to participate in this research project on the understanding that I am doing so on a voluntary basis and that I can stop participating in this research project anytime I feel like withdrawing. My participation will be in a form of one on one interviews and a series of workshops (Change Laboratory Workshops). There will be a series of workshops but as a lecturer will be required to participate in three of the ten workshops. Each workshop will last for a maximum of two hours. This will take place at the Centre for Open and Distance Learning seminar room at Mzuzu University. The workshop will involve discussions on how best we could collectively or categorically support Science and Mathematics students at Mzuzu University studying via ODL mode of delivery. Research background It has been a tradition that Science and Mathematics students have had it difficult to persist to graduation in higher education institutions throughout the world. This has particularly been worse for students studying through ODL mode of delivery. This phenomenon hasn't spared such category of students in Malawi. Even though Malawi Government policy has made a deliberate policy of making higher education accessible by officially accepting and adopting ODL as an alternative route to higher education, cases of student drop out in Science and Mathematics have persistently been high. This has resulted in shortage of Science and Mathematics teachers in Malawian secondary schools. The situation has been made worse by the recent curriculum review in secondary school education system where Science and Mathematics have been made core subjects. It is against this background that this study attempts to explore academic support strategies to Science and Mathematics students under ODL mode of delivery at Mzuzu University in Malawi. I strongly believe that my participation in this research project will contribute towards the improvement of student learning in open distance and e-Learning environments.

Yours sincerely,

_____ Signed _____ Date

Appendix 5: Students' survey questionnaire

1. Indicate your sex (please tick where appropriate)

   Male ☐

   Female ☐

2. What kind of continuous assessments or assignments are given to you?

   (a) Group ☐

   (b) Individual ☐

   (c) Take home assignment ☐

   (d) Campus written assignment ☐

   (e) Other ☐

   Specify_____

   _____

3. How do you categorise yourself as a student:

   (a) Rural ☐

   (b) Urban ☐

   (c) Working

      (i) Full time, ☐

      (ii) Part-time ☐

      (iii) Work related to study. Yes ☐ No ☐

4. Categorisation of students according to their overall grade performance prior to entry into ODL programme at university

(a) Less than 20 points ☐

(b) 20 to 24 points ☐

(c) 25 to 29 points ☐

(d) 30 to 36 points ☐

5. Categorisation of students according to age ranges

(a) Under 20 years of age ☐

(b) 20 to 24 years of age ☐

(c) 25 to 29 years of age ☐

(d) 30 to 36 years of age ☐

(e) Above 36 years of age ☐

6. Rate your average interaction with your peers in academic matters

(a) Weekly ☐

(b) Fortnightly ☐

(c) Monthly ☐

(d) Once in two months ☐

(e) Once in a semester ☐

(f) Never ☐

7. Rate your average interaction with field facilitators

(a) Weekly ☐

(b) Fortnightly ☐

(c) Monthly ☐

(d) Once in two months ☐

(e) Once in a semester ☐

(f) Never ☐

8. What has been your frequently used means of interaction or communication with your peers?

(a) Cellphone ☐

(b) SMS ☐

(c) Email ☐

(d) Social media ☐ specify: _____

(e) Surface mail (post mail) ☐

9. What has been your frequently used means of interaction or communication with your field facilitators? You can choose more than one.

(a) Cellphone ☐

(b) SMS ☐

(c) Email ☐

(d) Social media ☐ specify: _____

(e) Surface mail (post mail) ☐

10. Which one(s) of the following is/are your key sources of academic information while on campus? You can choose more than one.

(a) Instructional modules ☐

(b) Mzuzu University library ☐

(c) National Library service ☐

(d) Lecturers' handouts or teaching notes ☐

(e) Internet ☐

(f) Departmental books ☐

(g) Peer ☐

(h) Other Specify_____ ☐

11. Which one(s) of the following is/are your key sources of academic information during home study. You can choose more than one.

(a) Instructional modules ☐

(b) Mzuzu University library ☐

(c) National Library service ☐

(d) Lecturers' handouts or teaching notes ☐

(e) Internet ☐

(f) Departmental books ☐

(g) Peers ☐

(h) Other ☐

Specify_____

12. Do you have access to ICT facilities at campus?

(a) Yes ☐

(b) No ☐

13. If your response was yes in 12 above, what kind of ICT facilities do you have access to?

(a) Desktop computers ☐

(b) Laptop computers ☐

(c) Web enabled cello phones ☐

(d) Tablets ☐

(e) Other ☐ Specify_____

14. Do you have access to ICT facilities off campus?

Yes ☐

No ☐

15. If your response was yes in 14 above, what kind of ICT facilities do you have access to?

(a) Desktop computers ☐

(b) Laptop computers ☐

(c) Web enabled cello phones ☐

(d) Tablets ☐

(e) Other ☐ Specify_____

16. Do you have Internet access at campus?

Yes ☐

No ☐

17. If your answer was yes to 16 above, on what ICT tools do you access the Internet?

(a) Desktop computers ☐

(b) Laptop computers ☐

(c) Web enabled cello phones ☐

(d) Tablets ☐

(e) Other ☐ Specify_____

18. Do you have Internet access while off campus?

Yes ☐

No ☐

19. If your answer was yes to 18 above, on what ICT tools do you access Internet?

(a) Desktop computers ☐

(b) Laptop computers ☐

(c) Web enabled cello phones ☐

(d) Tablets ☐

(e) Other ☐ Specify_____

20. What do you use the Internet for?

(a) Searching for reference materials ☐

(b) Online registration ☐

(c) Online access of assessment results ☐

(d) Seeking academic support from lecturers ☐

(e) Seeking academic support from field facilitators ☐

(f) Seeking academic support from student peers ☐

END OF QUESTIONNAIRE

Appendix 6: Focus group interview guide to students

1. Where do you get your reading materials from while on campus? From library/ODL centre/academic departments/peers/lecturers

2. Where do you get your materials from while off campus? From peers/community library (school library, national library, public reading space), did you find reading materials from these libraries relevant?

3. How far is the library from your home? How often do you visit the library?

4. How far is your home to the university?

5. How far is your home to the nearest field facilitation site?

6. Do you think the construction of satellite centres will be helpful academically?

7. What has been your challenge in participating in field facilitation exercises?

8. Do you find field facilitation useful? If yes how useful has it been? If not why?

Appendix 7: One-on-one interview guide to lecturers

1. What is the size of your class?

2. Teaching background and training?

3. Your academic roles as a lecturer in ODL environment.

4. Are you satisfied with the academic support that you render to your students during module orientation sessions? If yes, what do you think is a cause for mass failure rates in science and mathematical disciplines in ODL at Mzuzu University?

   Are you satisfied with the academic support that you render to your students during home study sessions?

   If yes, how do you academically support your students during home study sessions? If no, how best would you support students during home study sessions? Do you think an idea of field facilitation (tutorial support) is helping in enhancing Science and Mathematics learning during home study sessions? Would you please explain?

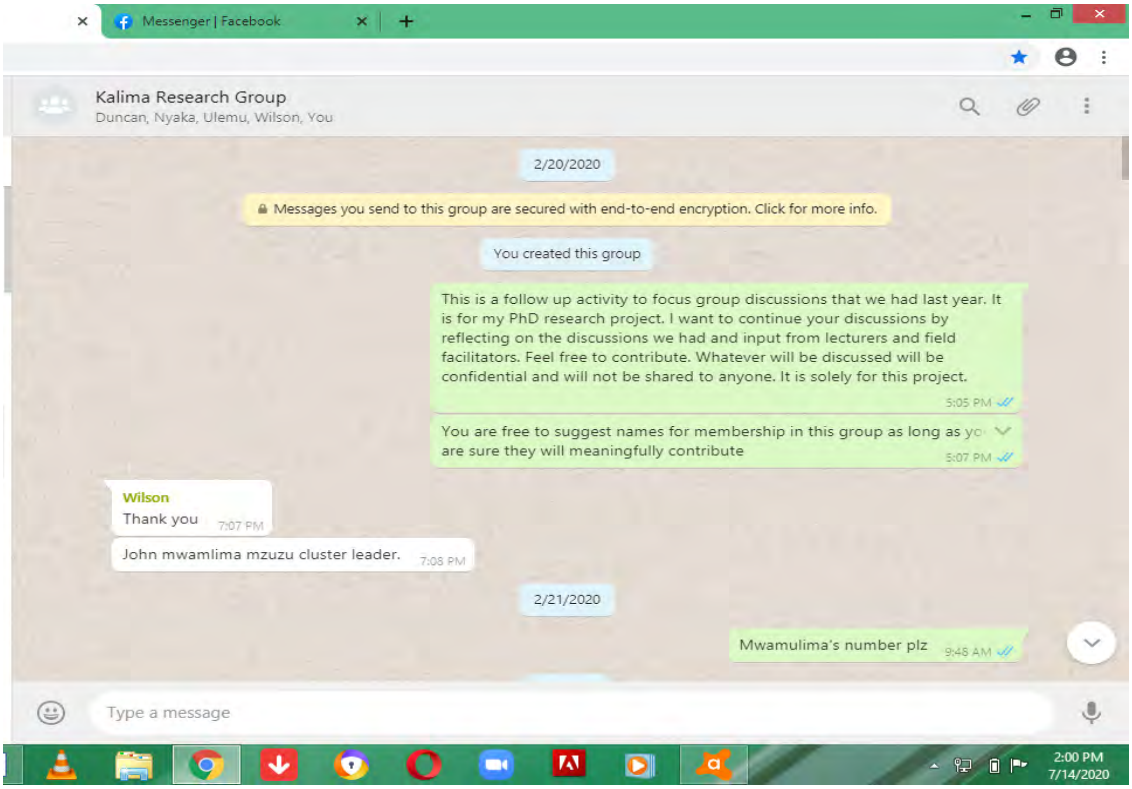
5. If not satisfied, what are the problems? How could those problems be resolved?

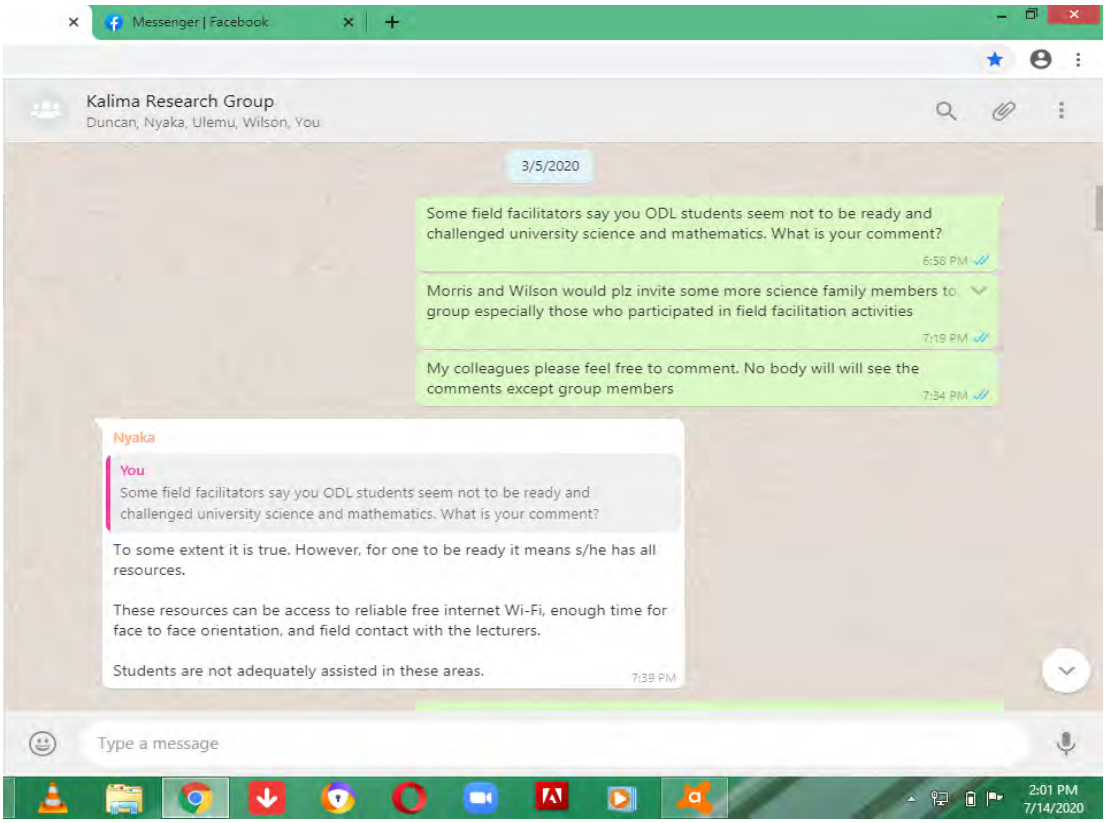
6. Is the current field facilitation academic support strategy effective? If not, what do you think are the challenges?

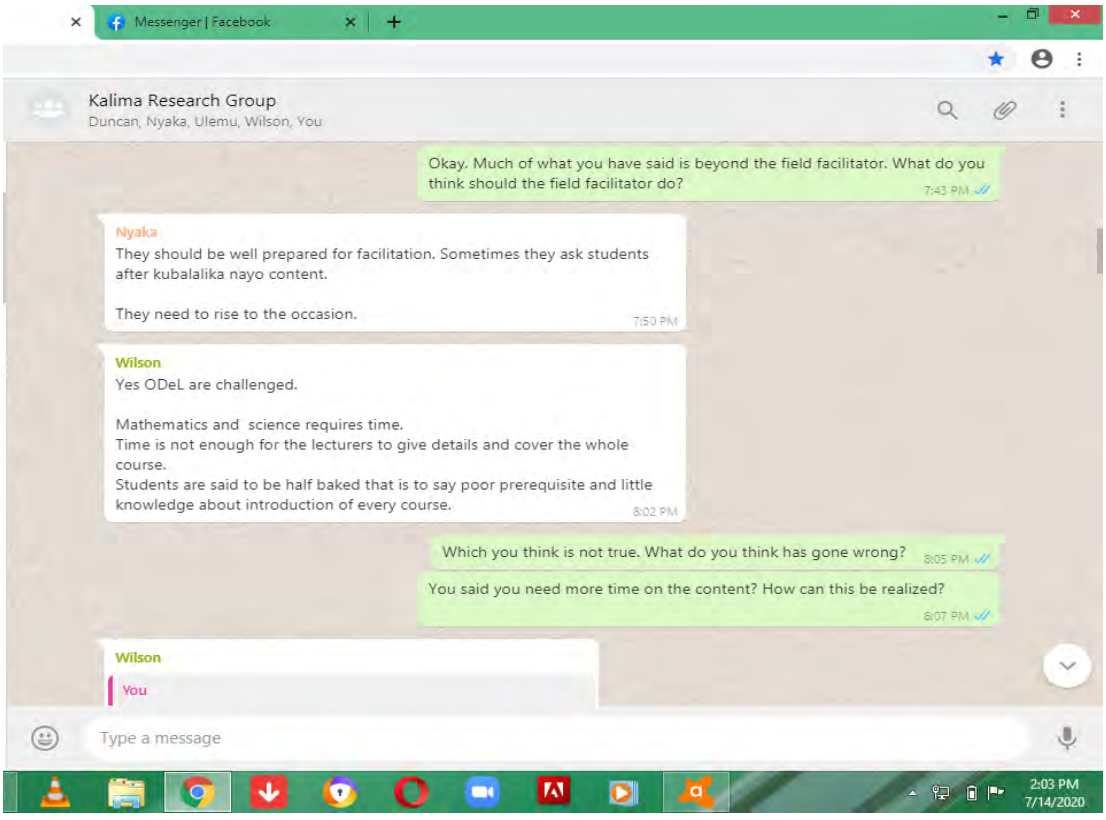
Appendix 8: One-on-one interview guide to field facilitators

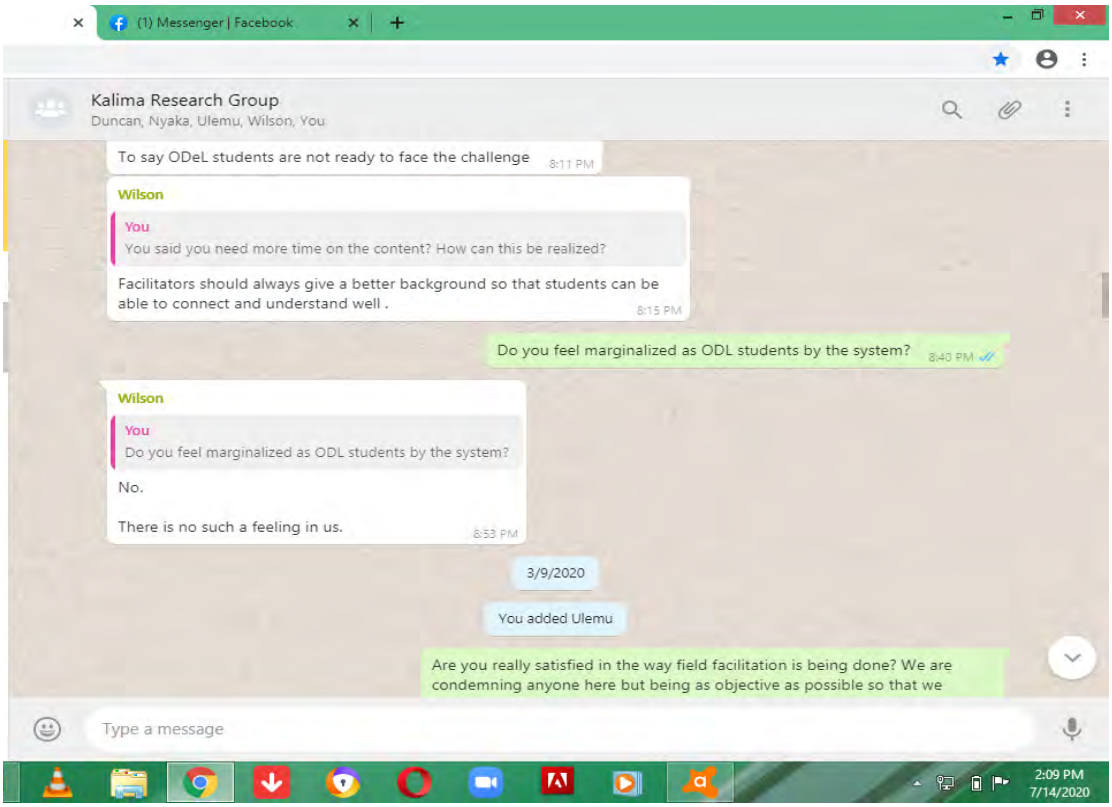
1. Student participation in study circles or field facilitations.
2. Student participation in on campus orientations
3. Student observation of assignment due dates
4. Student usage of online library resources
5. Student use of e-modules and print modules.
6. Student use of supplementary reading materials other than the modules (e and print)
7. What supplementary reading materials do you give to your students?
8. How many students do you handle at the field facilitation site?
9. Are you satisfied the way you support your students at the field facilitation site? Why not?
10. If not, what do you wish to include in your facilitation package?
11. Do you think you need to be trained in facilitation skills for you to be able to support the students well?
12. Do you think you have right tools for your activities?
13. What field facilitation strategies or methods do you use?
14. What strategies have been effective and why?
15. What strategies have been ineffective and why?
16. How would the ineffective facilitation strategies be improved to enhance student retention, progression and graduation in sciences and mathematics?

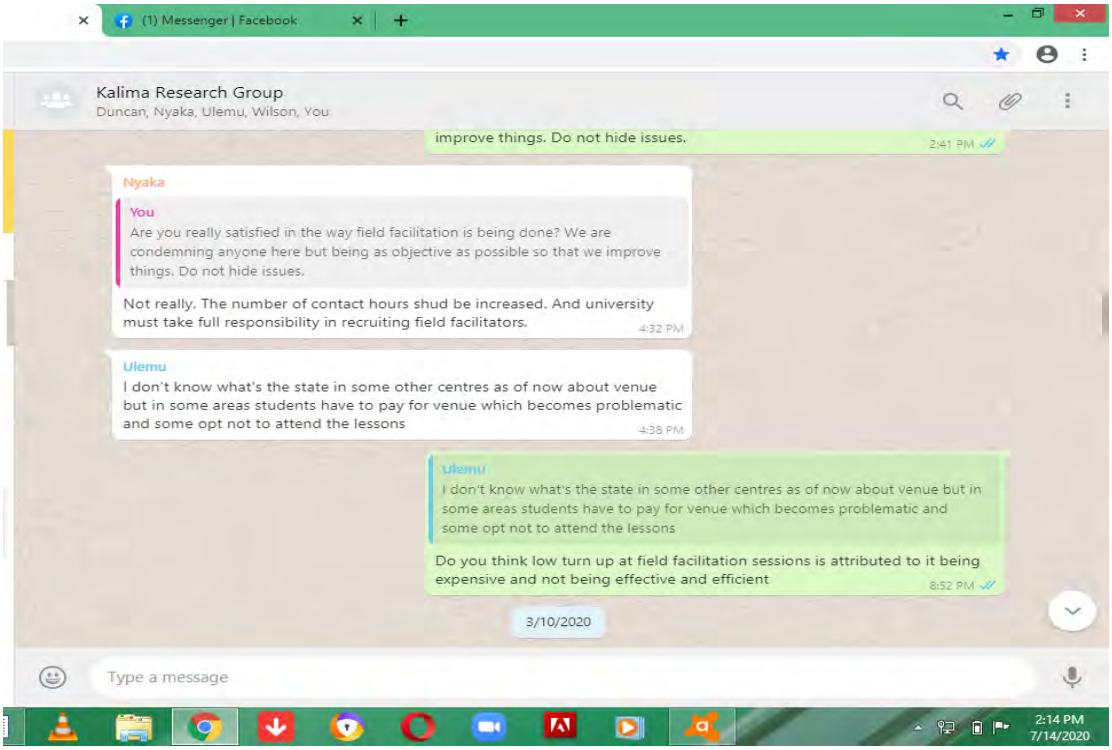
Appendix 9: Students' WhatsApp group discussions

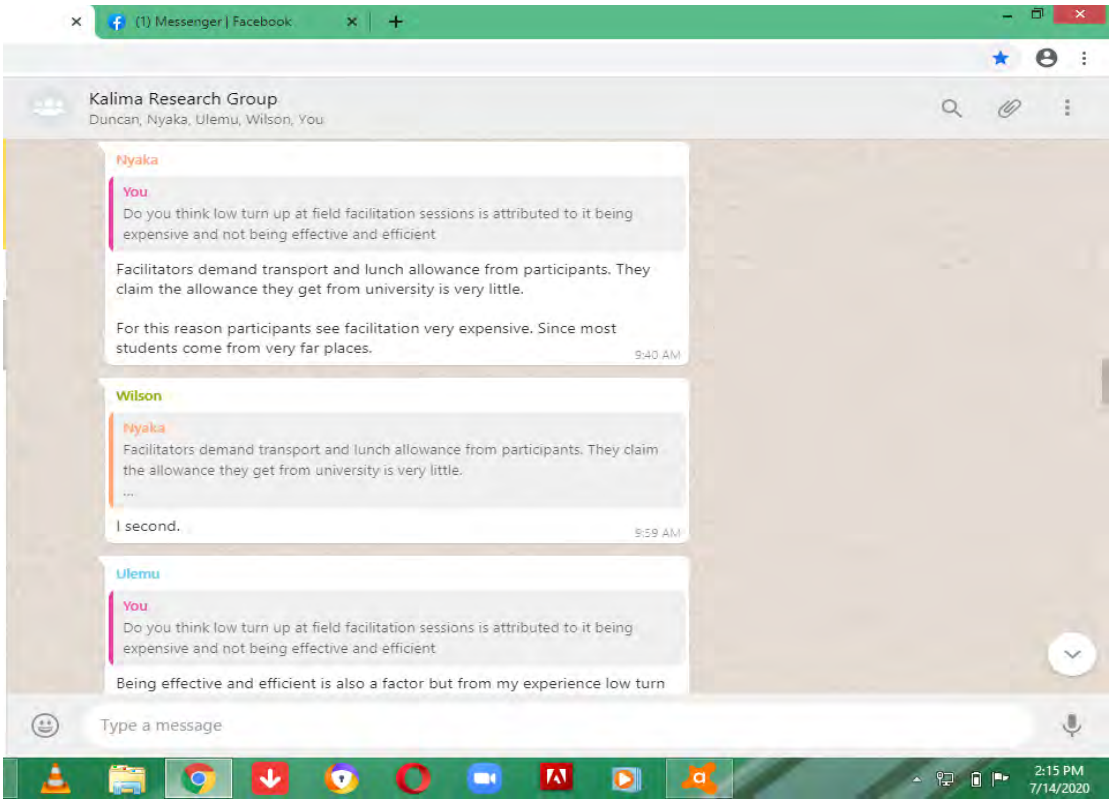


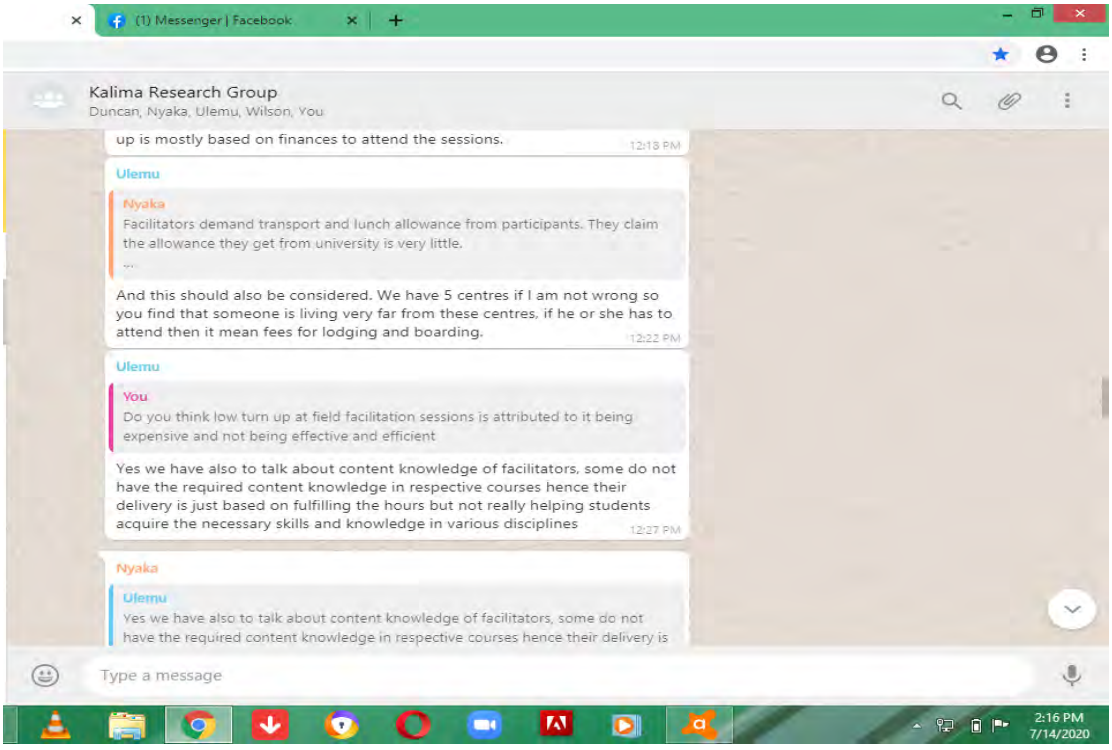

Messenger | Facebook
Kalima Research Group
Duncan, Nyaka, Ulemu, Wilson, You
3/5/2020
Some field facilitators say you ODL students seem not to be ready and challenged university science and mathematics. What is your comment?
6:58 PM
Morris and Wilson would plz invite some more science family members to group especially those who participated in field facilitation activities
7:19 PM
My colleagues please feel free to comment. No body will will see the comments except group members
7:34 PM
Nyaka
You
Some field facilitators say you ODL students seem not to be ready and challenged university science and mathematics. What is your comment?
To some extent it is true. However, for one to be ready it means s/he has all resources.
These resources can be access to reliable free internet Wi-Fi, enough time for face to face orientation, and field contact with the lecturers.
Students are not adequately assisted in these areas.
7:39 PM
Type a message
2:01 PM
7/14/2020

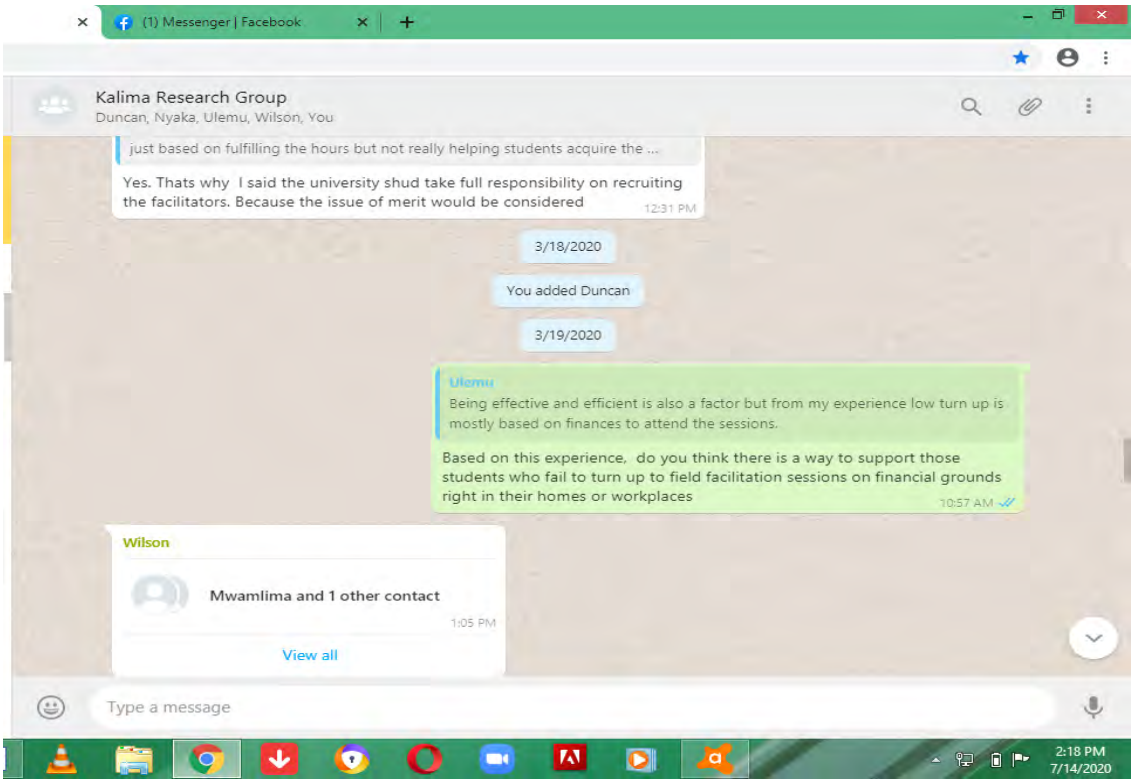

Messenger | Facebook
Kalima Research Group
Duncan, Nyaka, Ulemu, Wilson, You
Okay. Much of what you have said is beyond the field facilitator. What do you think should the field facilitator do?
7:43 PM
Nyaka
They should be well prepared for facilitation. Sometimes they ask students after kubalalika nayo content.
They need to rise to the occasion.
7:50 PM
Wilson
Yes ODeL are challenged.
Mathematics and science requires time.
Time is not enough for the lecturers to give details and cover the whole course.
Students are said to be half baked that is to say poor prerequisite and little knowledge about introduction of every course.
8:02 PM
Which you think is not true. What do you think has gone wrong?
8:05 PM
You said you need more time on the content? How can this be realized?
8:07 PM
Wilson
You
Type a message
2:03 PM
7/14/2020

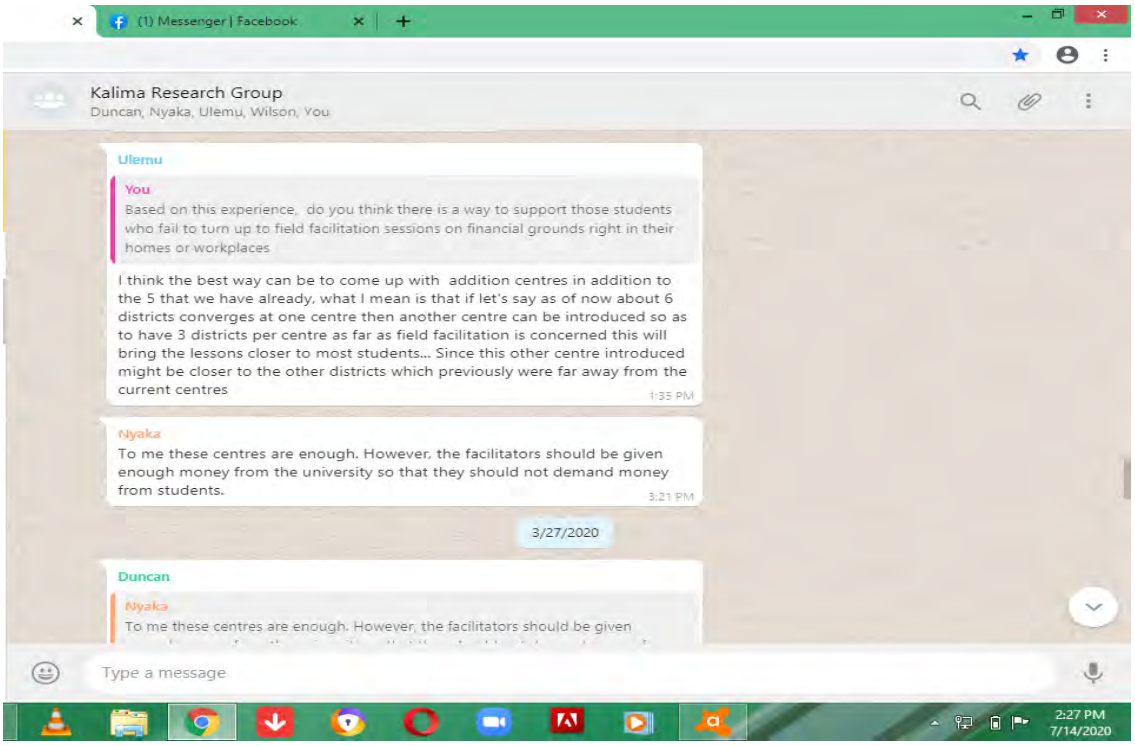

(1) Messenger | Facebook
Kalima Research Group
Duncan, Nyaka, Ulemu, Wilson, You
To say ODeL students are not ready to face the challenge 8:11 PM
Wilson
You
You said you need more time on the content? How can this be realized?
Facilitators should always give a better background so that students can be able to connect and understand well . 8:15 PM
Do you feel marginalized as ODL students by the system? 8:40 PM
Wilson
You
Do you feel marginalized as ODL students by the system?
No.
There is no such a feeling in us. 8:53 PM
3/9/2020
You added Ulemu
Are you really satisfied in the way field facilitation is being done? We are condemning anyone here but being as objective as possible so that we
Type a message
2:09 PM
7/14/2020

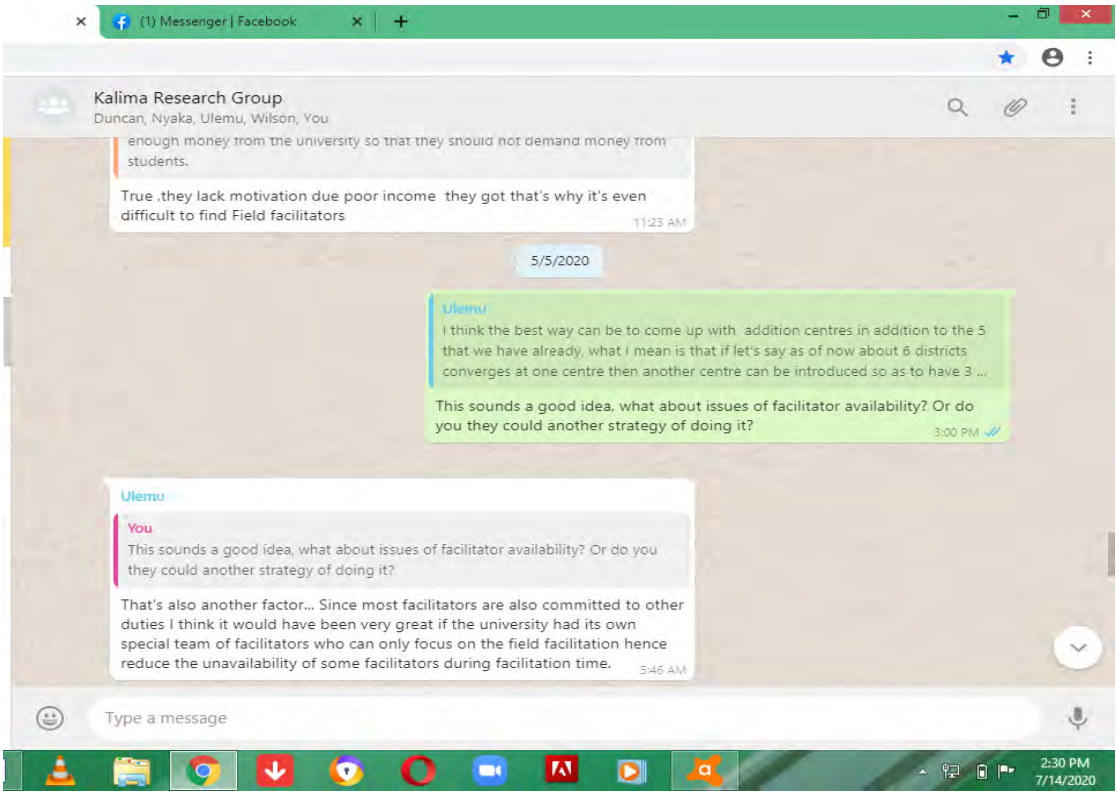

(1) Messenger | Facebook
Kalima Research Group
Duncan, Nyaka, Ulemu, Wilson, You
improve things. Do not hide issues. 2:41 PM
Nyaka
You
Are you really satisfied in the way field facilitation is being done? We are condemning anyone here but being as objective as possible so that we improve things. Do not hide issues.
Not really. The number of contact hours shud be increased. And university must take full responsibility in recruiting field facilitators. 4:32 PM
Ulemu
I don't know what's the state in some other centres as of now about venue but in some areas students have to pay for venue which becomes problematic and some opt not to attend the lessons 4:38 PM
Ulemu
I don't know what's the state in some other centres as of now about venue but in some areas students have to pay for venue which becomes problematic and some opt not to attend the lessons
Do you think low turn up at field facilitation sessions is attributed to it being expensive and not being effective and efficient 8:52 PM
3/10/2020
Type a message
2:14 PM
7/14/2020

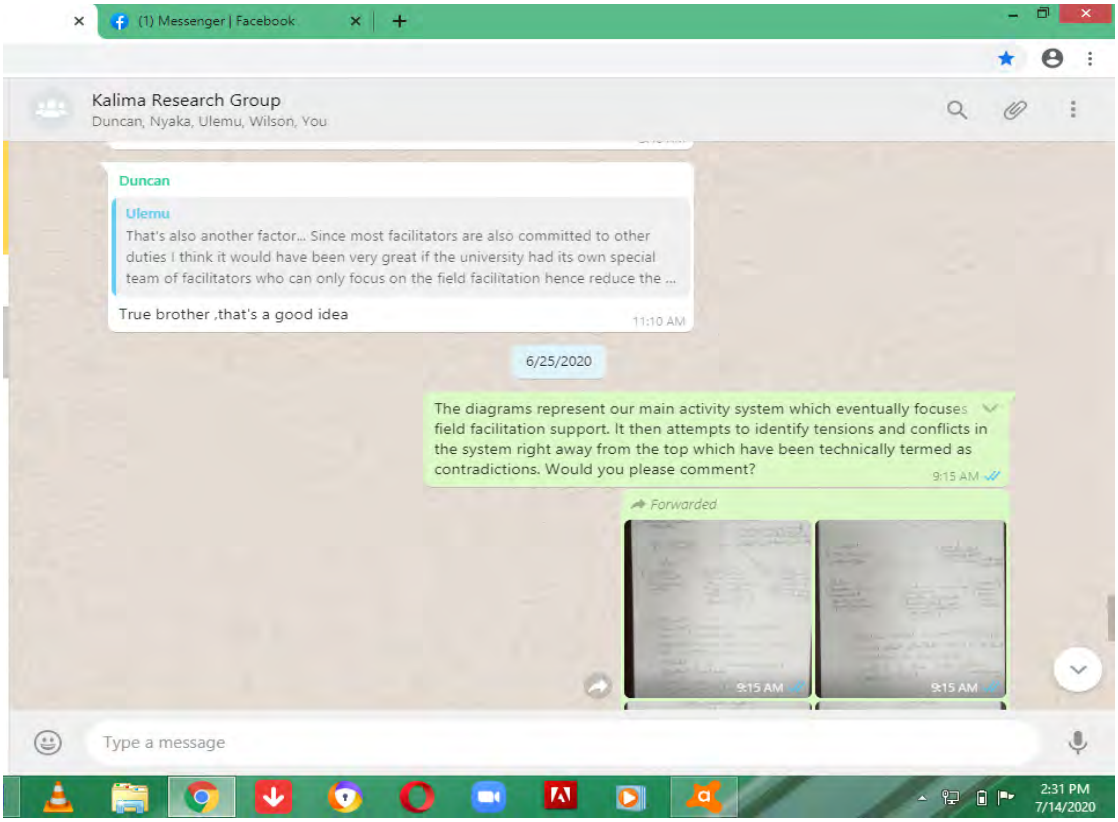

(1) Messenger | Facebook
Kalima Research Group
Duncan, Nyaka, Ulemu, Wilson, You
Nyaka
You
Do you think low turn up at field facilitation sessions is attributed to it being expensive and not being effective and efficient
Facilitators demand transport and lunch allowance from participants. They claim the allowance they get from university is very little.
For this reason participants see facilitation very expensive. Since most students come from very far places.
9:40 AM
Wilson
Nyaka
Facilitators demand transport and lunch allowance from participants. They claim the allowance they get from university is very little.
...
I second.
9:59 AM
Ulemu
You
Do you think low turn up at field facilitation sessions is attributed to it being expensive and not being effective and efficient
Being effective and efficient is also a factor but from my experience low turn
Type a message
2:15 PM
7/14/2020

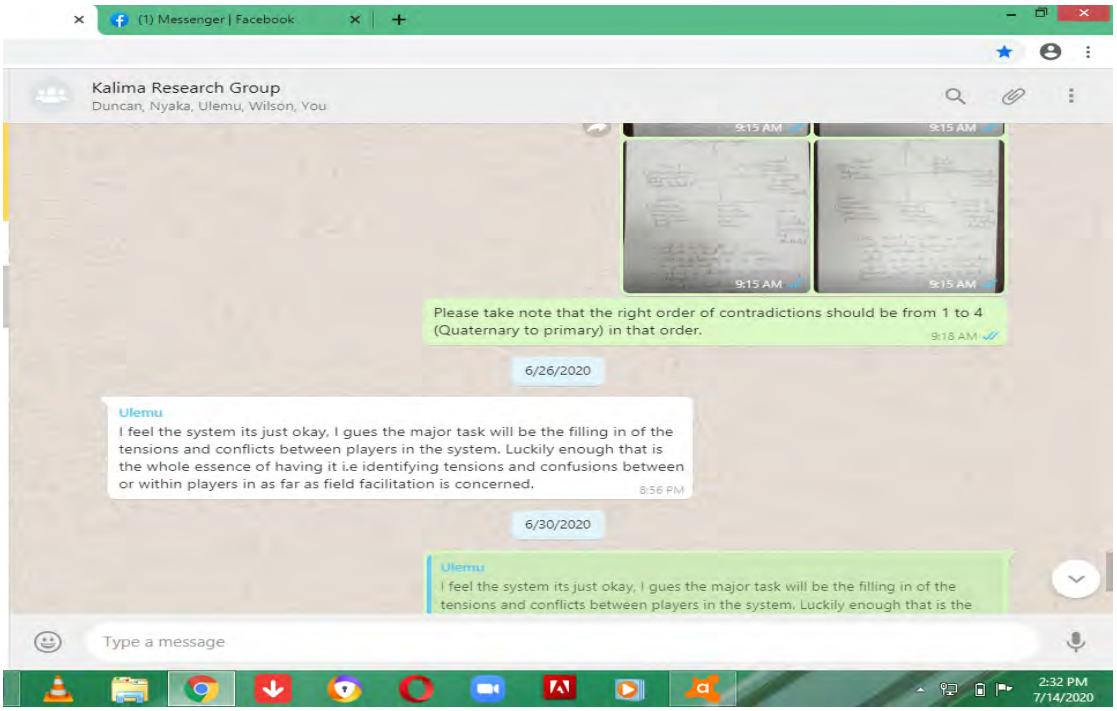

(1) Messenger | Facebook
Kalima Research Group
Duncan, Nyaka, Ulemu, Wilson, You
up is mostly based on finances to attend the sessions.
12:18 PM
Ulemu
Nyaka
Facilitators demand transport and lunch allowance from participants. They claim the allowance they get from university is very little.
...
And this should also be considered. We have 5 centres if I am not wrong so you find that someone is living very far from these centres, if he or she has to attend then it mean fees for lodging and boarding.
12:22 PM
Ulemu
You
Do you think low turn up at field facilitation sessions is attributed to it being expensive and not being effective and efficient
Yes we have also to talk about content knowledge of facilitators, some do not have the required content knowledge in respective courses hence their delivery is just based on fulfilling the hours but not really helping students acquire the necessary skills and knowledge in various disciplines
12:27 PM
Nyaka
Ulemu
Yes we have also to talk about content knowledge of facilitators, some do not have the required content knowledge in respective courses hence their delivery is
Type a message
2:16 PM
7/14/2020

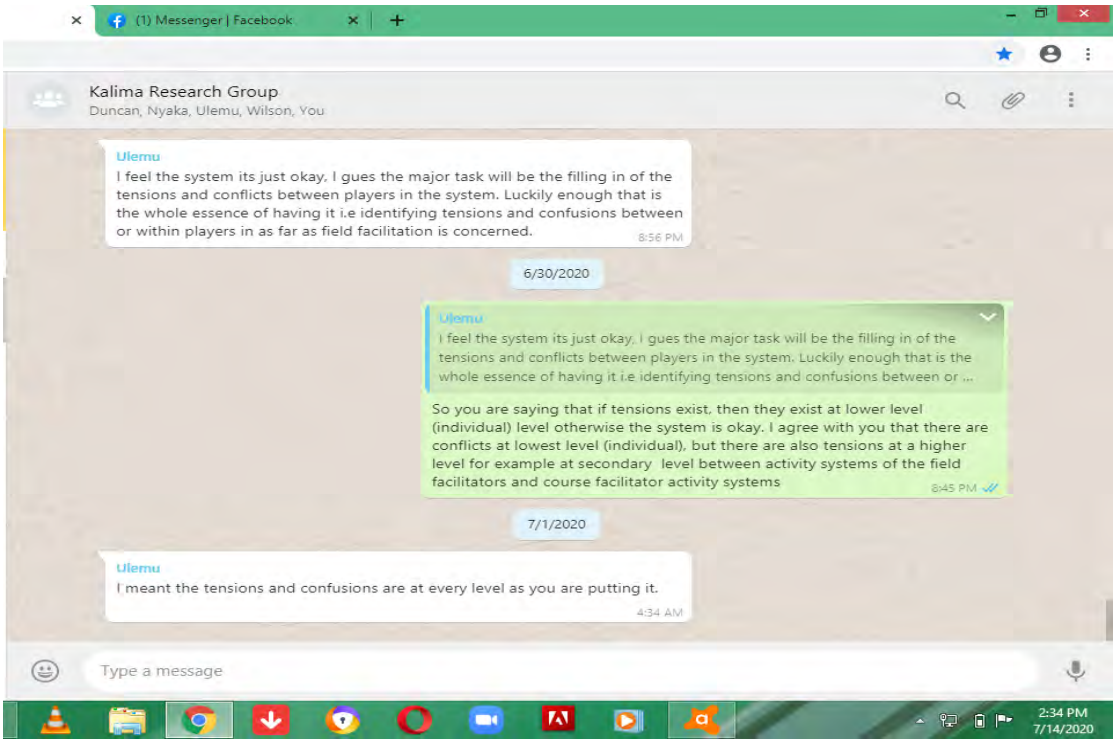

(1) Messenger | Facebook
Kalima Research Group
Duncan, Nyaka, Ulemu, Wilson, You
just based on fulfilling the hours but not really helping students acquire the ...
Yes. Thats why I said the university shud take full responsibility on recruiting the facilitators. Because the issue of merit would be considered
12:31 PM
3/18/2020
You added Duncan
3/19/2020
Ulemu
Being effective and efficient is also a factor but from my experience low turn up is mostly based on finances to attend the sessions.
Based on this experience, do you think there is a way to support those students who fail to turn up to field facilitation sessions on financial grounds right in their homes or workplaces
10:57 AM
Wilson
Mwamlima and 1 other contact
1:05 PM
View all
Type a message
2:18 PM
7/14/2020


(1) Messenger | Facebook
Kalima Research Group
Duncan, Nyaka, Ulemu, Wilson, You
Ulemu
You
Based on this experience, do you think there is a way to support those students who fail to turn up to field facilitation sessions on financial grounds right in their homes or workplaces
I think the best way can be to come up with addition centres in addition to the 5 that we have already, what I mean is that if let's say as of now about 6 districts converges at one centre then another centre can be introduced so as to have 3 districts per centre as far as field facilitation is concerned this will bring the lessons closer to most students... Since this other centre introduced might be closer to the other districts which previously were far away from the current centres
1:35 PM
Nyaka
To me these centres are enough. However, the facilitators should be given enough money from the university so that they should not demand money from students.
3:21 PM
3/27/2020
Duncan
Nyaka
To me these centres are enough. However, the facilitators should be given
Type a message
2:27 PM
7/14/2020

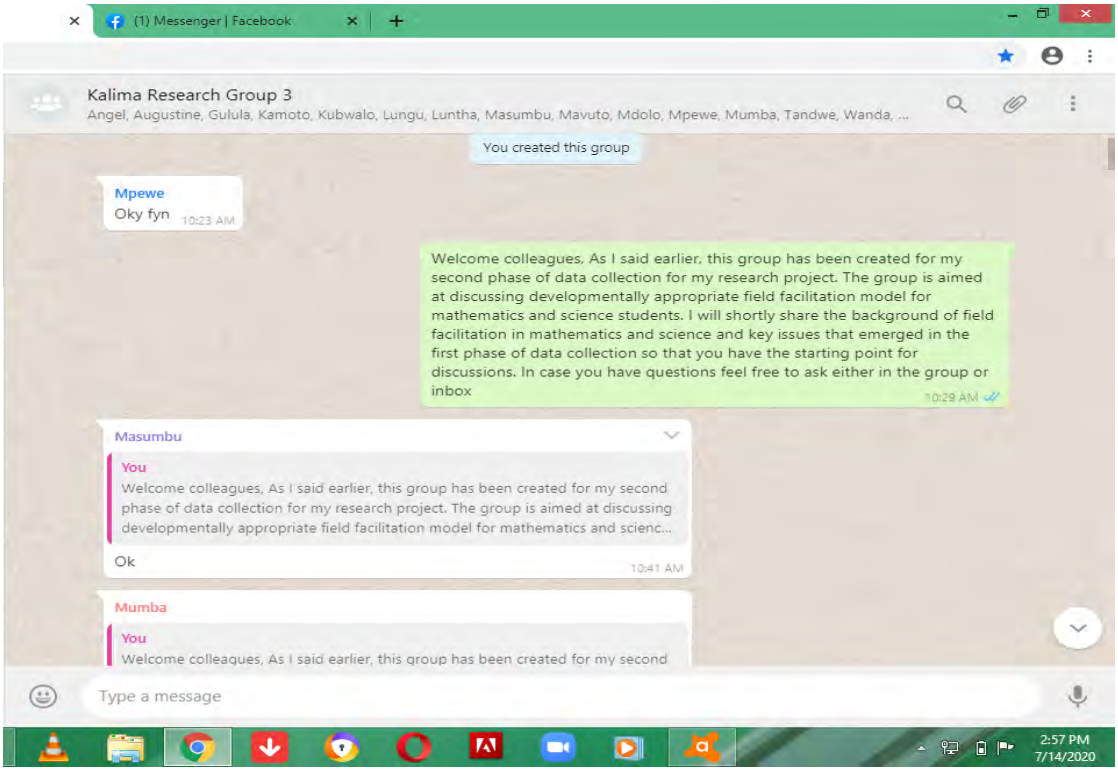

(1) Messenger | Facebook
Kalima Research Group
Duncan, Nyaka, Ulemu, Wilson, You
enough money from the university so that they should not demand money from students.
True ,they lack motivation due poor income they got that's why it's even difficult to find Field facilitators
11:23 AM
5/5/2020
Ulemu
I think the best way can be to come up with addition centres in addition to the 5 that we have already, what I mean is that if let's say as of now about 6 districts converges at one centre then another centre can be introduced so as to have 3 ...
This sounds a good idea, what about issues of facilitator availability? Or do you they could another strategy of doing it?
3:00 PM
Ulemu
You
This sounds a good idea, what about issues of facilitator availability? Or do you they could another strategy of doing it?
That's also another factor... Since most facilitators are also committed to other duties I think it would have been very great if the university had its own special team of facilitators who can only focus on the field facilitation hence reduce the unavailability of some facilitators during facilitation time.
5:46 AM
Type a message
2:30 PM
7/14/2020

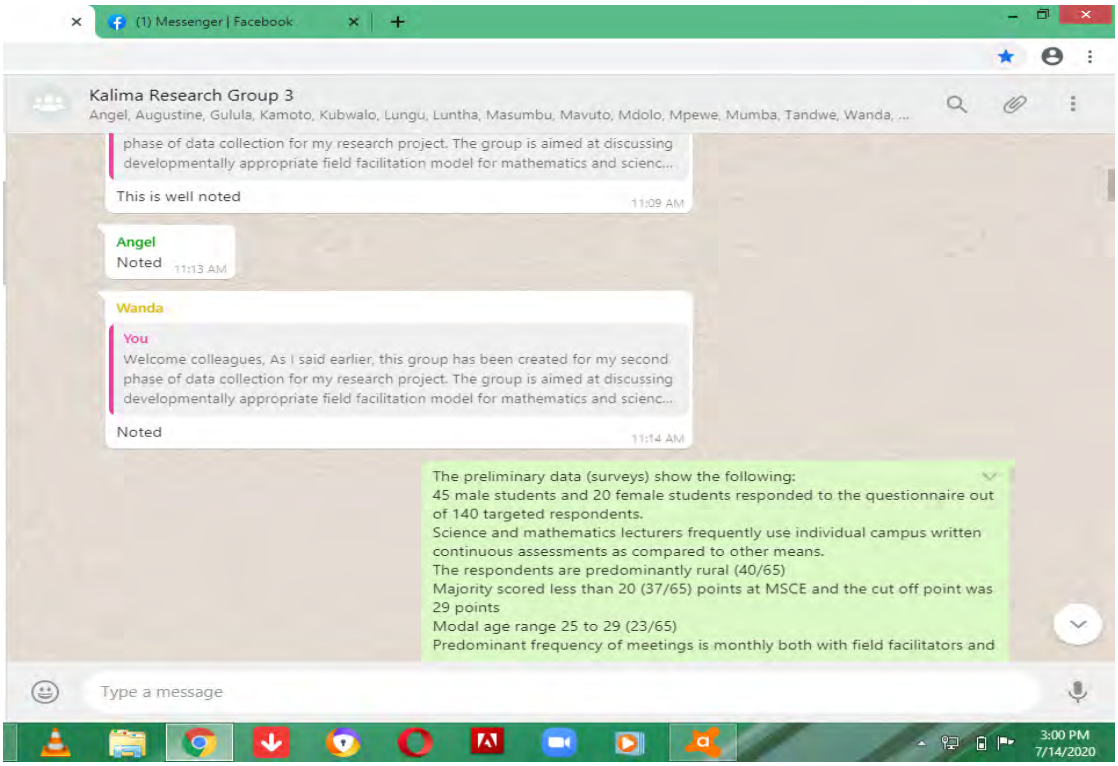

(1) Messenger | Facebook
Kalima Research Group
Duncan, Nyaka, Ulemu, Wilson, You
Duncan
Ulemu
That's also another factor... Since most facilitators are also committed to other duties I think it would have been very great if the university had its own special team of facilitators who can only focus on the field facilitation hence reduce the ...
True brother ,that's a good idea
11:10 AM
6/25/2020
The diagrams represent our main activity system which eventually focuses field facilitation support. It then attempts to identify tensions and conflicts in the system right away from the top which have been technically termed as contradictions. Would you please comment?
9:15 AM
Forwarded
9:15 AM
9:15 AM
Type a message
2:31 PM
7/14/2020

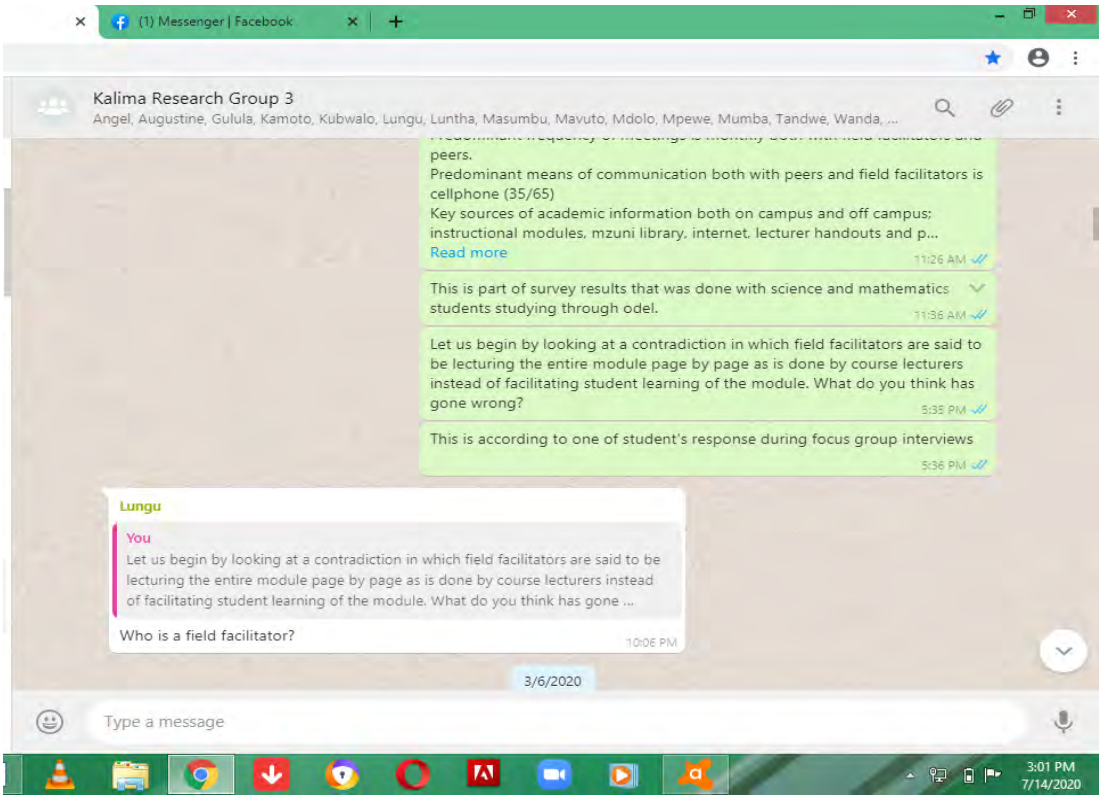

(1) Messenger | Facebook
Kalima Research Group
Duncan, Nyaka, Ulemu, Wilson, You
9:15 AM
9:15 AM
9:15 AM
9:15 AM
Please take note that the right order of contradictions should be from 1 to 4 (Quaternary to primary) in that order.
9:18 AM
6/26/2020
Ulemu
I feel the system its just okay, I gues the major task will be the filling in of the tensions and conflicts between players in the system. Luckily enough that is the whole essence of having it i.e identifying tensions and confusions between or within players in as far as field facilitation is concerned.
8:56 PM
6/30/2020
Ulemu
I feel the system its just okay, I gues the major task will be the filling in of the tensions and conflicts between players in the system. Luckily enough that is the
Type a message
2:32 PM
7/14/2020

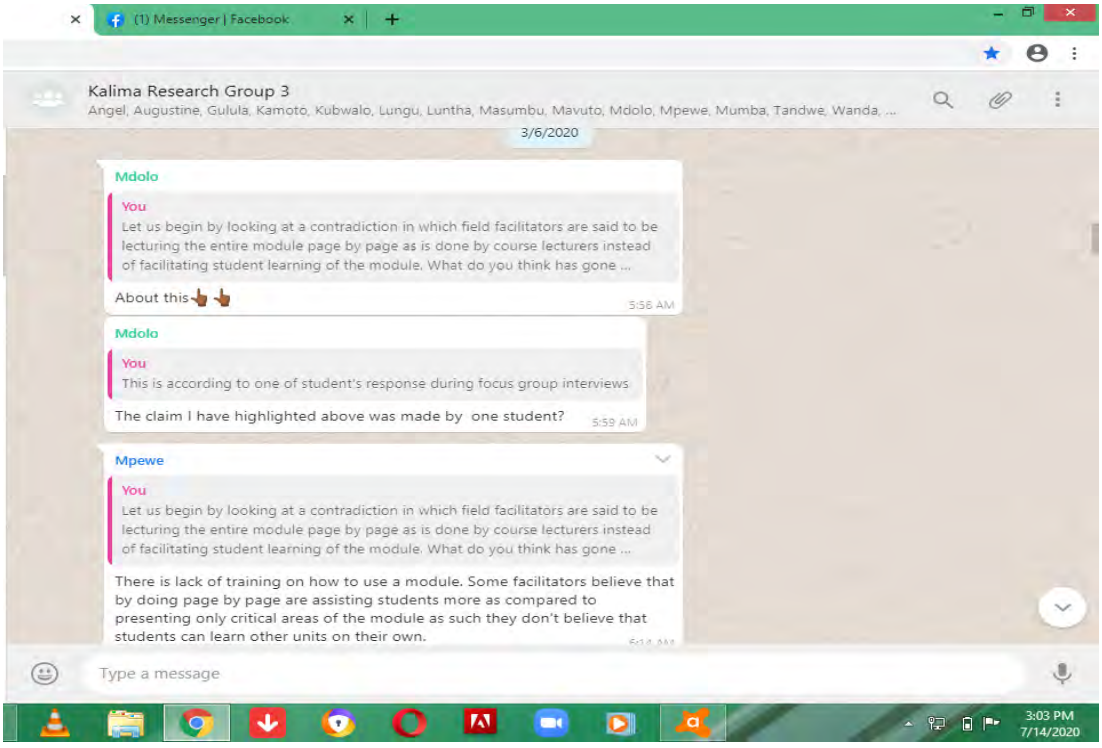

(1) Messenger | Facebook
Kalima Research Group
Duncan, Nyaka, Ulemu, Wilson, You
Ulemu
I feel the system its just okay, I gues the major task will be the filling in of the tensions and conflicts between players in the system. Luckily enough that is the whole essence of having it i.e identifying tensions and confusions between or within players in as far as field facilitation is concerned.
8:56 PM
6/30/2020
Ulemu
I feel the system its just okay, I gues the major task will be the filling in of the tensions and conflicts between players in the system. Luckily enough that is the whole essence of having it i.e identifying tensions and confusions between or ...
So you are saying that if tensions exist, then they exist at lower level (individual) level otherwise the system is okay. I agree with you that there are conflicts at lowest level (individual), but there are also tensions at a higher level for example at secondary level between activity systems of the field facilitators and course facilitator activity systems
8:45 PM
7/1/2020
Ulemu
I meant the tensions and confusions are at every level as you are putting it.
4:34 AM
Type a message
2:34 PM
7/14/2020

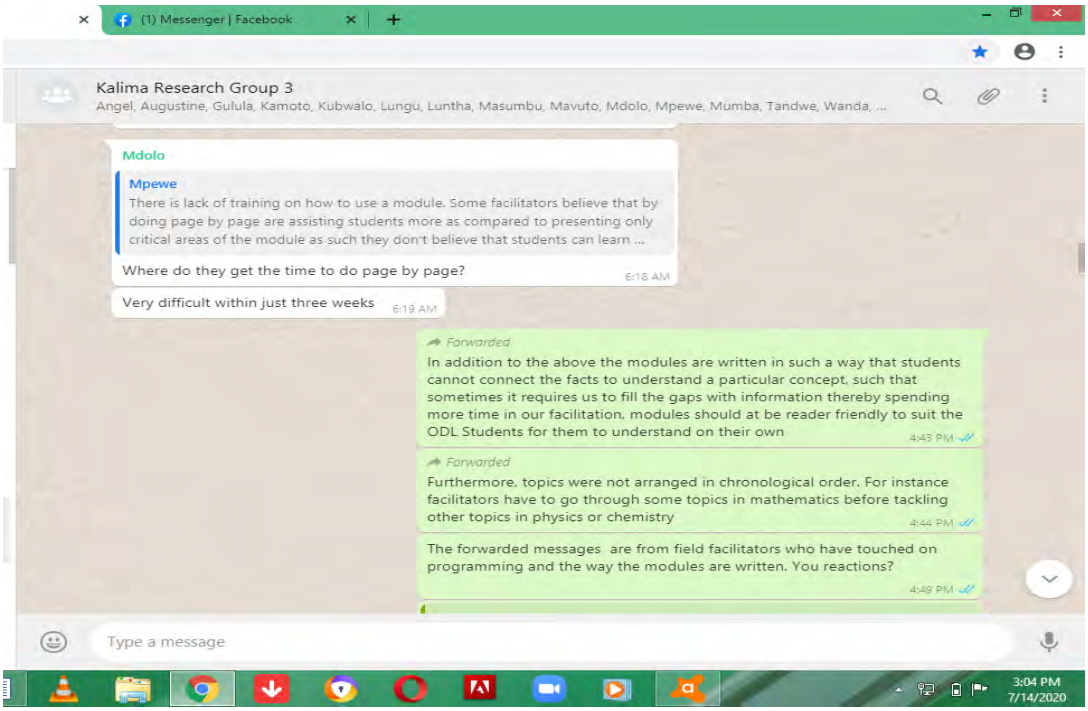
Appendix 10: Lecturers' WhatsApp group discussion

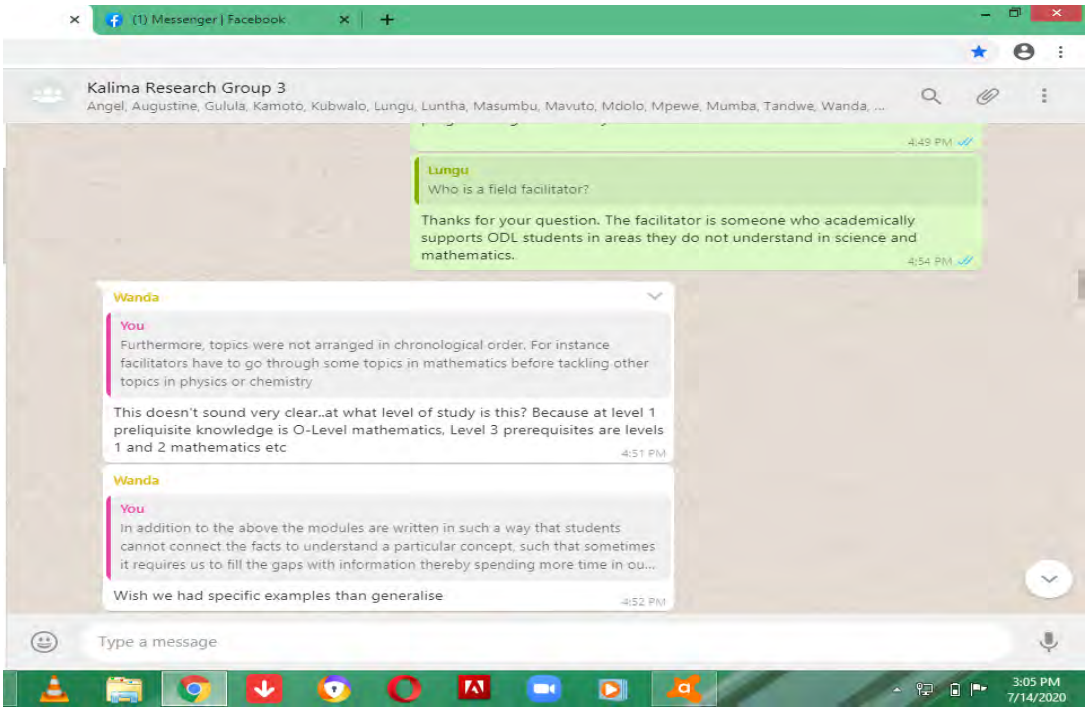


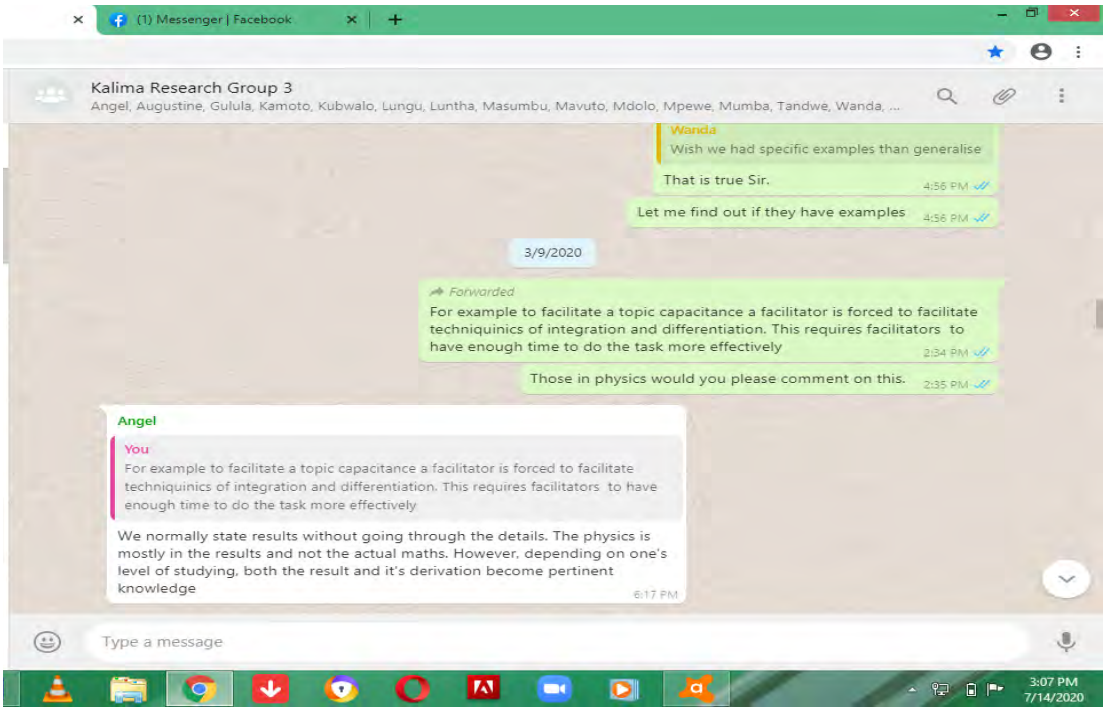


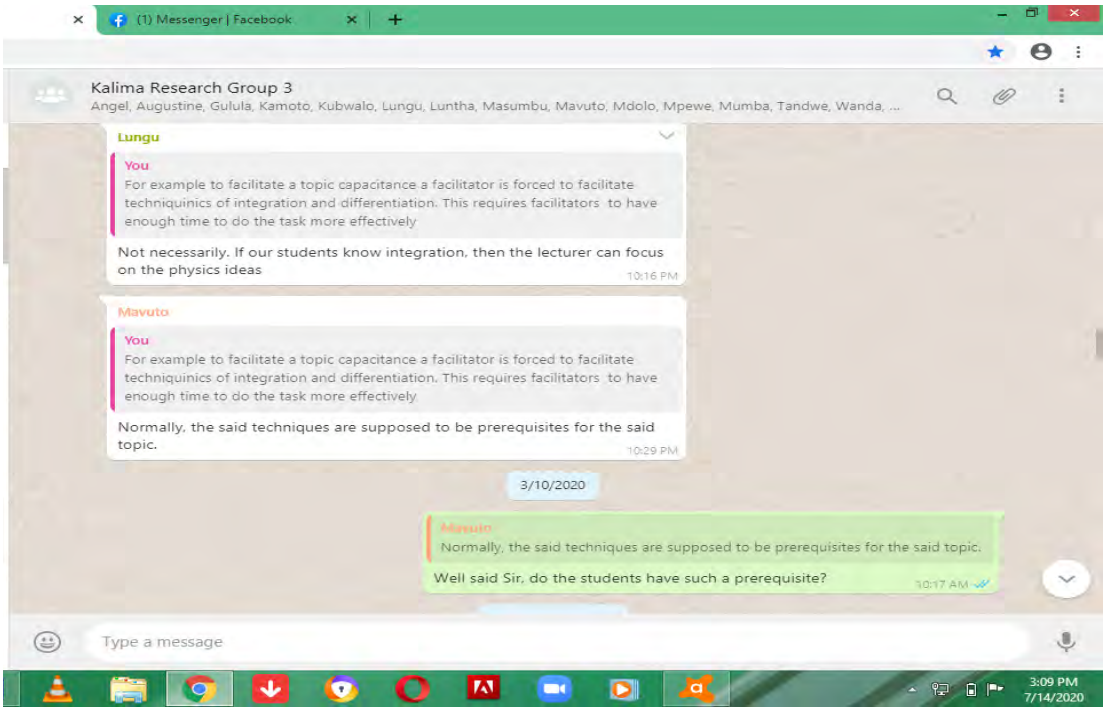

(1) Messenger | Facebook
Kalima Research Group 3
Angel, Augustine, Gulula, Kamoto, Kubwalo, Lungu, Luntha, Masumbu, Mavuto, Mdolo, Mpewe, Mumba, Tandwe, Wanda, ...
peers.
Predominant means of communication both with peers and field facilitators is cellphone (35/65)
Key sources of academic information both on campus and off campus: instructional modules, mzuni library, internet, lecturer handouts and p...
Read more
11:26 AM
This is part of survey results that was done with science and mathematics students studying through odel.
11:36 AM
Let us begin by looking at a contradiction in which field facilitators are said to be lecturing the entire module page by page as is done by course lecturers instead of facilitating student learning of the module. What do you think has gone wrong?
5:35 PM
This is according to one of student's response during focus group interviews
5:36 PM
Lungu
You
Let us begin by looking at a contradiction in which field facilitators are said to be lecturing the entire module page by page as is done by course lecturers instead of facilitating student learning of the module. What do you think has gone ...
Who is a field facilitator?
10:06 PM
3/6/2020
Type a message
3:01 PM
7/14/2020

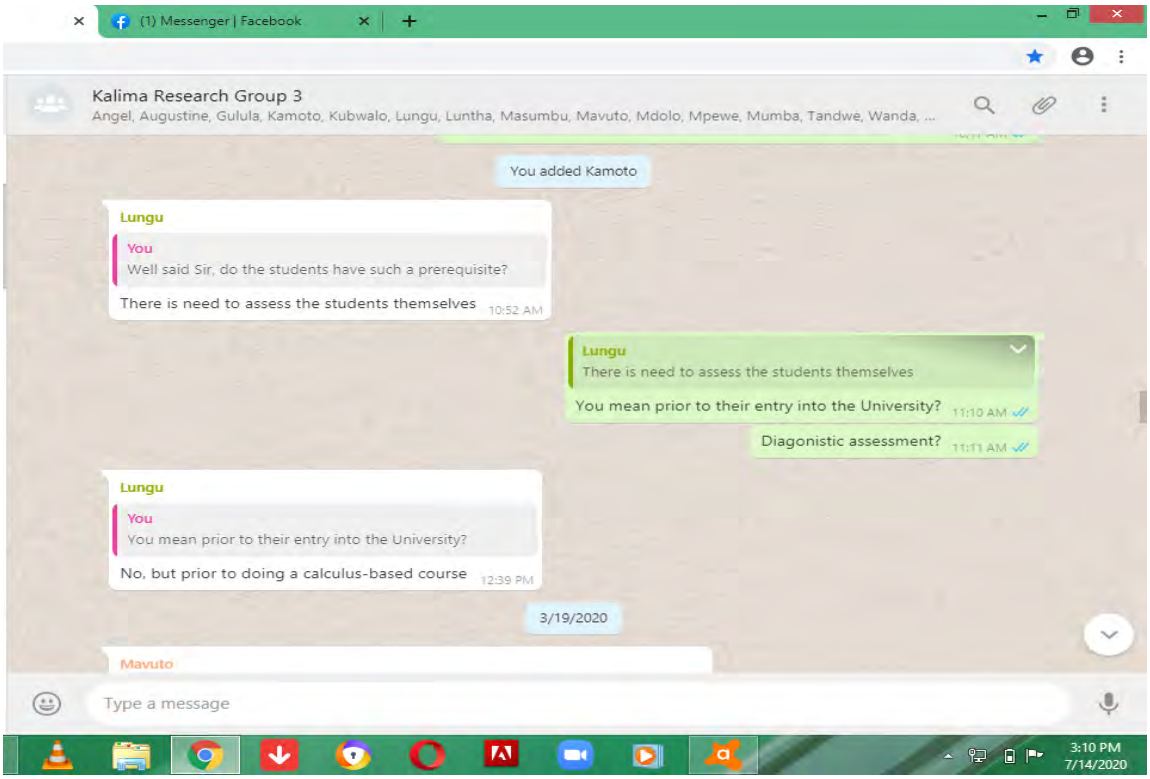

(1) Messenger | Facebook
Kalima Research Group 3
Angel, Augustine, Gulula, Kamoto, Kubwalo, Lungu, Luntha, Masumbu, Mavuto, Mdolo, Mpewe, Mumba, Tandwe, Wanda, ...
3/6/2020
Mdolo
You
Let us begin by looking at a contradiction in which field facilitators are said to be lecturing the entire module page by page as is done by course lecturers instead of facilitating student learning of the module. What do you think has gone ...
About this👆👆
5:58 AM
Mdolo
You
This is according to one of student's response during focus group interviews
The claim I have highlighted above was made by one student?
5:59 AM
Mpewe
You
Let us begin by looking at a contradiction in which field facilitators are said to be lecturing the entire module page by page as is done by course lecturers instead of facilitating student learning of the module. What do you think has gone ...
There is lack of training on how to use a module. Some facilitators believe that by doing page by page are assisting students more as compared to presenting only critical areas of the module as such they don't believe that students can learn other units on their own.
Type a message
3:03 PM
7/14/2020

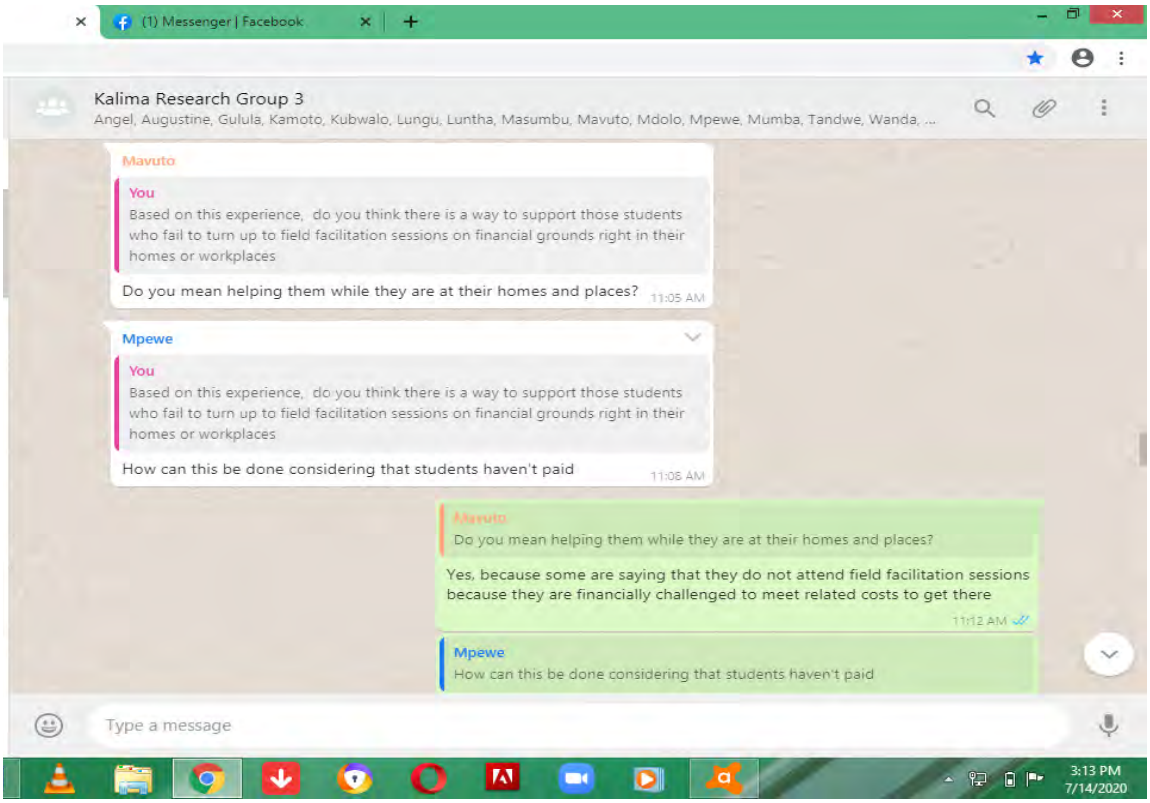

(1) Messenger | Facebook
Kalima Research Group 3
Angel, Augustine, Gulula, Kamoto, Kubwalo, Lungu, Luntha, Masumbu, Mavuto, Mdolo, Mpewe, Mumba, Tandwe, Wanda, ...
Mdolo
Mpewe
There is lack of training on how to use a module. Some facilitators believe that by doing page by page are assisting students more as compared to presenting only critical areas of the module as such they don't believe that students can learn ...
Where do they get the time to do page by page?
6:18 AM
Very difficult within just three weeks
6:19 AM
Forwarded
In addition to the above the modules are written in such a way that students cannot connect the facts to understand a particular concept, such that sometimes it requires us to fill the gaps with information thereby spending more time in our facilitation, modules should at be reader friendly to suit the ODL Students for them to understand on their own
4:43 PM
Forwarded
Furthermore, topics were not arranged in chronological order. For instance facilitators have to go through some topics in mathematics before tackling other topics in physics or chemistry
4:44 PM
The forwarded messages are from field facilitators who have touched on programming and the way the modules are written. You reactions?
4:49 PM
Type a message
3:04 PM
7/14/2020

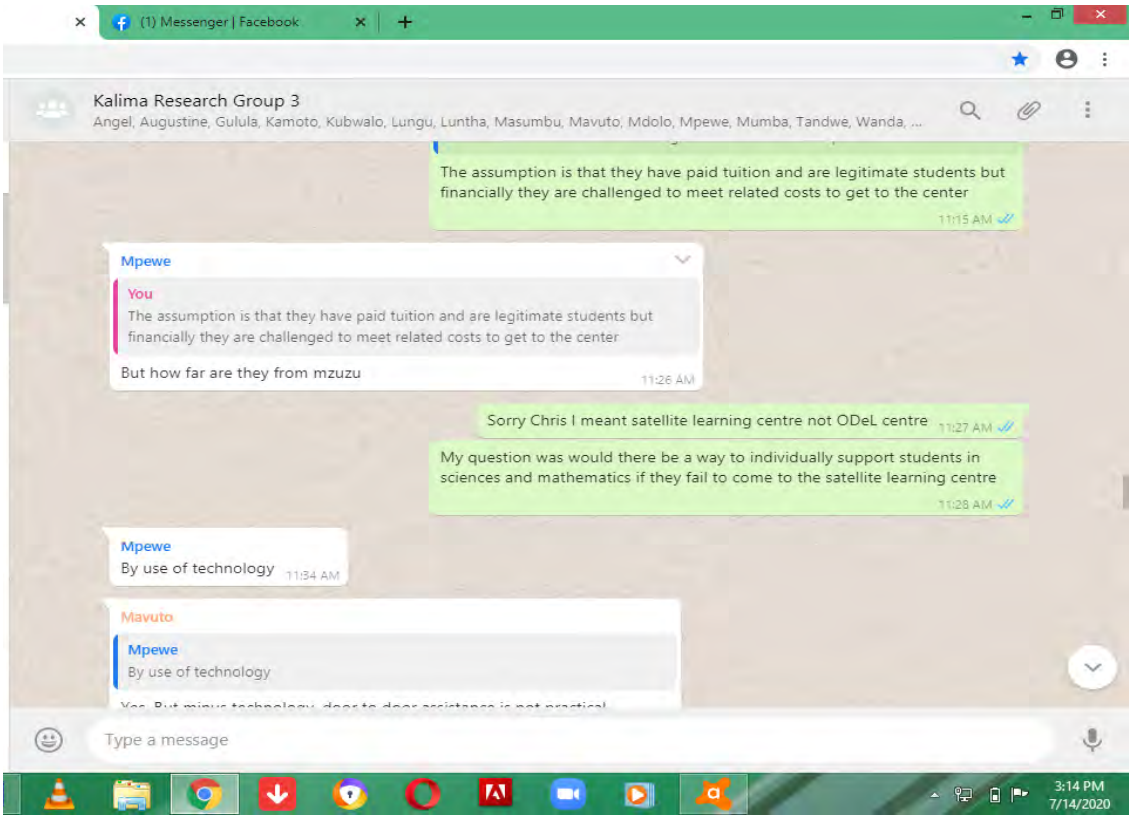

(1) Messenger | Facebook
Kalima Research Group 3
Angel, Augustine, Gulula, Kamoto, Kubwalo, Lungu, Luntha, Masumbu, Mavuto, Mdolo, Mpewe, Mumba, Tandwe, Wanda, ...
4:49 PM
Lungu
Who is a field facilitator?
Thanks for your question. The facilitator is someone who academically supports ODL students in areas they do not understand in science and mathematics.
4:54 PM
Wanda
You
Furthermore, topics were not arranged in chronological order. For instance facilitators have to go through some topics in mathematics before tackling other topics in physics or chemistry
This doesn't sound very clear..at what level of study is this? Because at level 1 preliquisite knowledge is O-Level mathematics, Level 3 prerequisites are levels 1 and 2 mathematics etc
4:51 PM
Wanda
You
In addition to the above the modules are written in such a way that students cannot connect the facts to understand a particular concept, such that sometimes it requires us to fill the gaps with information thereby spending more time in ou...
Wish we had specific examples than generalise
4:52 PM
Type a message
3:05 PM
7/14/2020

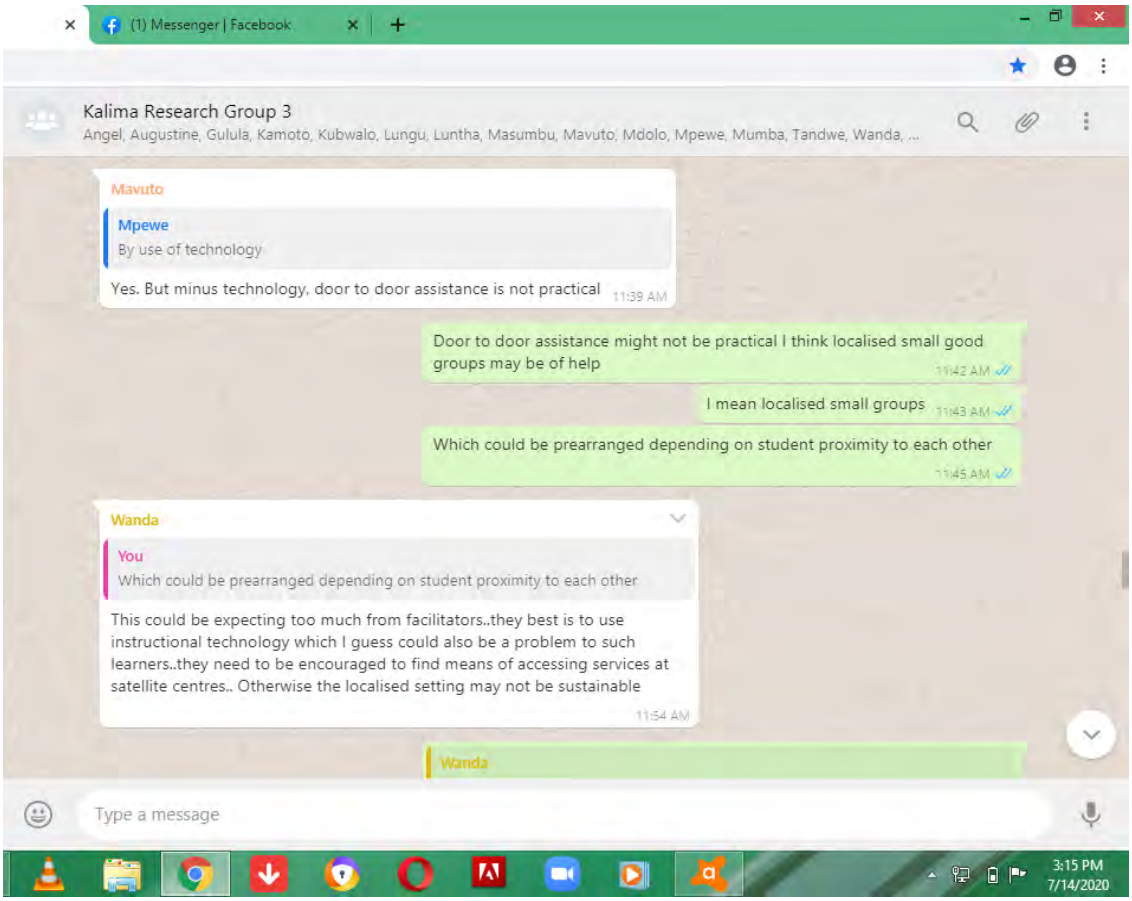

(1) Messenger | Facebook
Kalima Research Group 3
Angel, Augustine, Gulula, Kamoto, Kubwalo, Lungu, Luntha, Masumbu, Mavuto, Mdolo, Mpewe, Mumba, Tandwe, Wanda, ...
Wanda
Wish we had specific examples than generalise
That is true Sir.
4:56 PM
Let me find out if they have examples
4:56 PM
3/9/2020
Forwarded
For example to facilitate a topic capacitance a facilitator is forced to facilitate techniquinics of integration and differentiation. This requires facilitators to have enough time to do the task more effectively
2:34 PM
Those in physics would you please comment on this.
2:35 PM
Angel
You
For example to facilitate a topic capacitance a facilitator is forced to facilitate techniquinics of integration and differentiation. This requires facilitators to have enough time to do the task more effectively
We normally state results without going through the details. The physics is mostly in the results and not the actual maths. However, depending on one's level of studying, both the result and it's derivation become pertinent knowledge
6:17 PM
Type a message
3:07 PM
7/14/2020

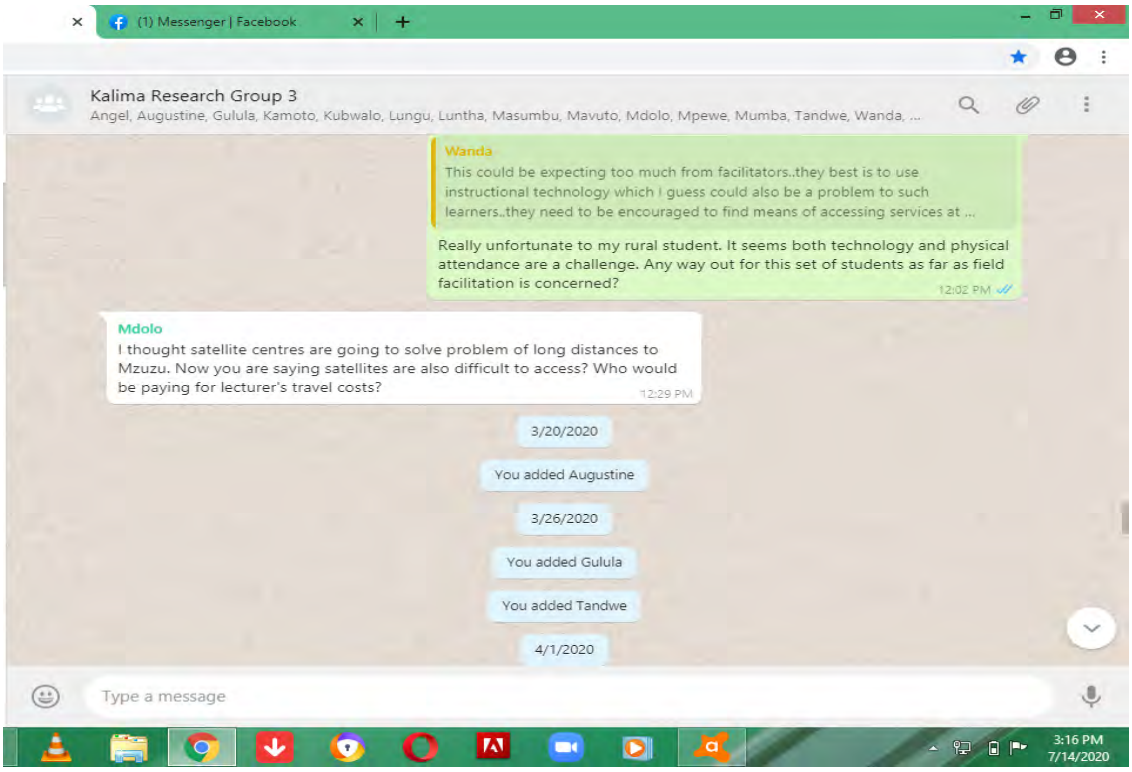

(1) Messenger | Facebook
Kalima Research Group 3
Angel, Augustine, Gulula, Kamoto, Kubwalo, Lungu, Luntha, Masumbu, Mavuto, Mdolo, Mpewe, Mumba, Tandwe, Wanda, ...
Lungu
You
For example to facilitate a topic capacitance a facilitator is forced to facilitate techniquinics of integration and differentiation. This requires facilitators to have enough time to do the task more effectively
Not necessarily. If our students know integration, then the lecturer can focus on the physics ideas
10:16 PM
Mavuto
You
For example to facilitate a topic capacitance a facilitator is forced to facilitate techniquinics of integration and differentiation. This requires facilitators to have enough time to do the task more effectively
Normally, the said techniques are supposed to be prerequisites for the said topic.
10:29 PM
3/10/2020
Mavuto
Normally, the said techniques are supposed to be prerequisites for the said topic.
Well said Sir, do the students have such a prerequisite?
10:17 AM
Type a message
3:09 PM
7/14/2020

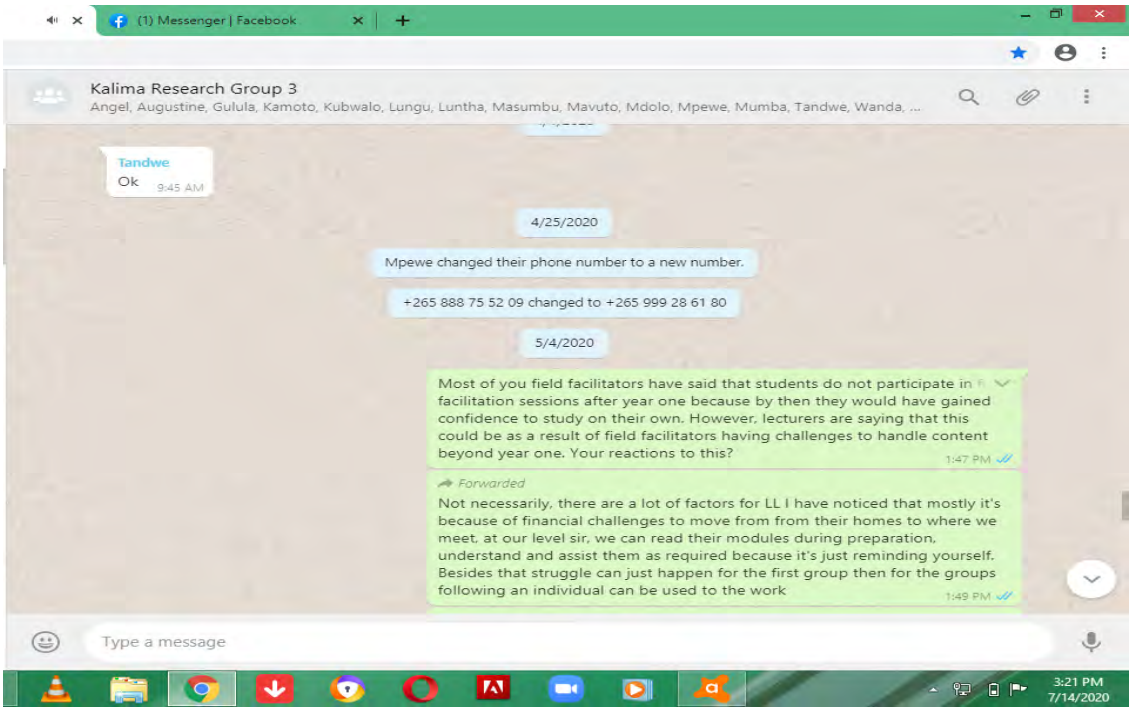

(1) Messenger | Facebook
Kalima Research Group 3
Angel, Augustine, Gulula, Kamoto, Kubwalo, Lungu, Luntha, Masumbu, Mavuto, Mdolo, Mpewe, Mumba, Tandwe, Wanda, ...
You added Kamoto
Lungu
You
Well said Sir, do the students have such a prerequisite?
There is need to assess the students themselves 10:52 AM
Lungu
There is need to assess the students themselves
You mean prior to their entry into the University? 11:10 AM
Diagonistic assessment? 11:11 AM
Lungu
You
You mean prior to their entry into the University?
No, but prior to doing a calculus-based course 12:39 PM
3/19/2020
Mavuto
Type a message
3:10 PM
7/14/2020

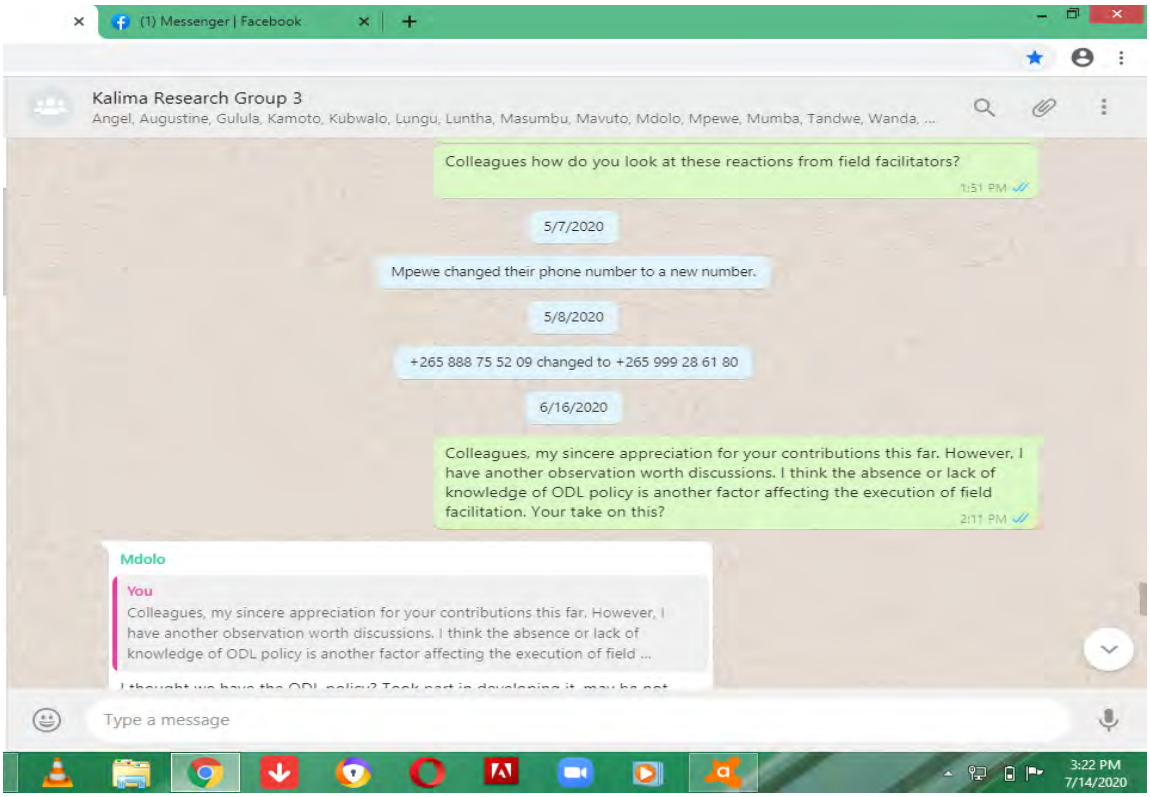

(1) Messenger | Facebook
Kalima Research Group 3
Angel, Augustine, Gulula, Kamoto, Kubwalo, Lungu, Luntha, Masumbu, Mavuto, Mdolo, Mpewe, Mumba, Tandwe, Wanda, ...
Mavuto
You
Based on this experience, do you think there is a way to support those students who fail to turn up to field facilitation sessions on financial grounds right in their homes or workplaces
Do you mean helping them while they are at their homes and places? 11:05 AM
Mpewe
You
Based on this experience, do you think there is a way to support those students who fail to turn up to field facilitation sessions on financial grounds right in their homes or workplaces
How can this be done considering that students haven't paid 11:08 AM
Mavuto
Do you mean helping them while they are at their homes and places?
Yes, because some are saying that they do not attend field facilitation sessions because they are financially challenged to meet related costs to get there 11:12 AM
Mpewe
How can this be done considering that students haven't paid
Type a message
3:13 PM
7/14/2020

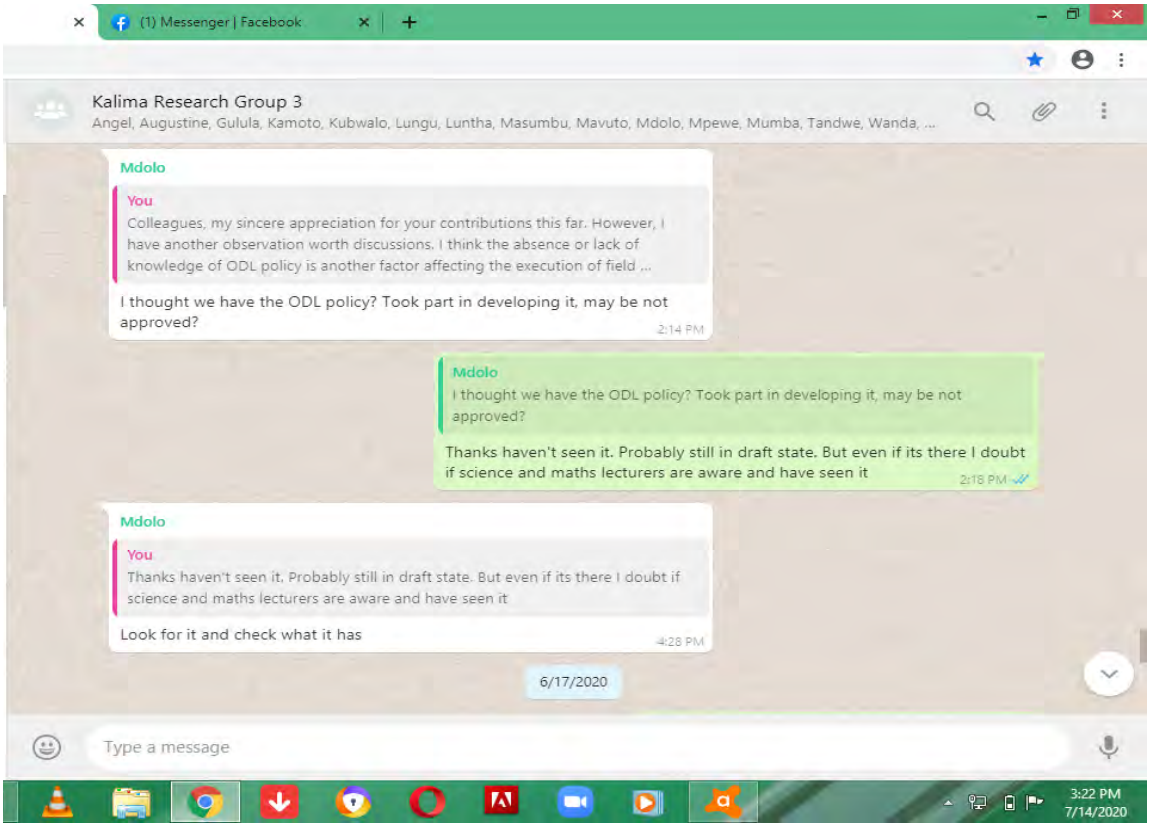

(1) Messenger | Facebook
Kalima Research Group 3
Angel, Augustine, Gulula, Kamoto, Kubwalo, Lungu, Luntha, Masumbu, Mavuto, Mdolo, Mpewe, Mumba, Tandwe, Wanda, ...
The assumption is that they have paid tuition and are legitimate students but financially they are challenged to meet related costs to get to the center
11:15 AM
Mpewe
You
The assumption is that they have paid tuition and are legitimate students but financially they are challenged to meet related costs to get to the center
But how far are they from mzuzu
11:26 AM
Sorry Chris I meant satellite learning centre not ODeL centre
11:27 AM
My question was would there be a way to individually support students in sciences and mathematics if they fail to come to the satellite learning centre
11:28 AM
Mpewe
By use of technology
11:34 AM
Mavuto
Mpewe
By use of technology
Type a message
3:14 PM
7/14/2020

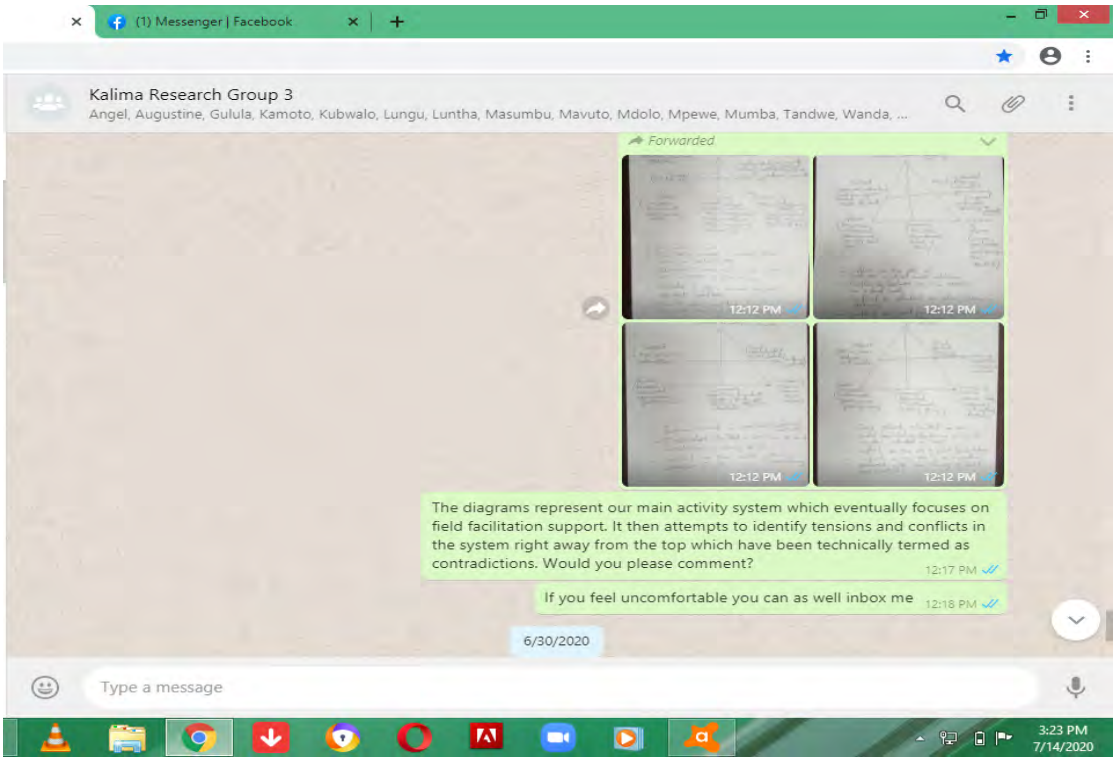

(1) Messenger | Facebook
Kalima Research Group 3
Angel, Augustine, Gulula, Kamoto, Kubwalo, Lungu, Luntha, Masumbu, Mavuto, Mdolo, Mpewe, Mumba, Tandwe, Wanda, ...
Mavuto
Mpewe
By use of technology
Yes. But minus technology, door to door assistance is not practical
11:39 AM
Door to door assistance might not be practical I think localised small good groups may be of help
11:42 AM
I mean localised small groups
11:43 AM
Which could be prearranged depending on student proximity to each other
11:45 AM
Wanda
You
Which could be prearranged depending on student proximity to each other
This could be expecting too much from facilitators..they best is to use instructional technology which I guess could also be a problem to such learners..they need to be encouraged to find means of accessing services at satellite centres.. Otherwise the localised setting may not be sustainable
11:54 AM
Wanda
Type a message
3:15 PM
7/14/2020

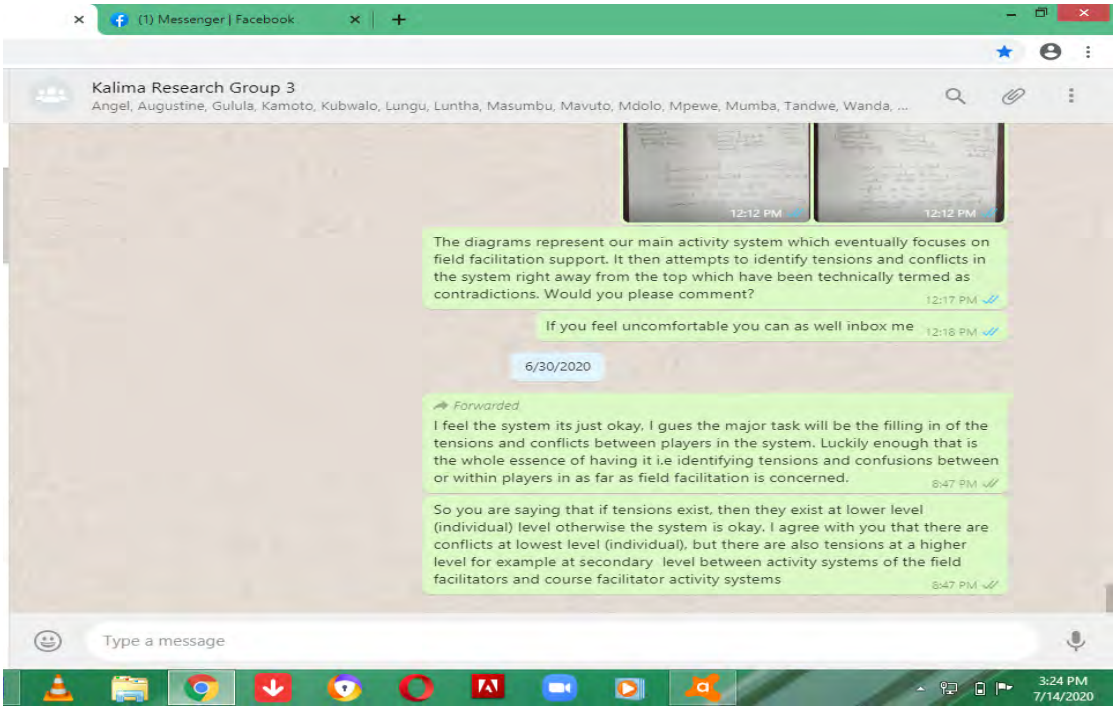

(1) Messenger | Facebook
Kalima Research Group 3
Angel, Augustine, Gulula, Kamoto, Kubwalo, Lungu, Luntha, Masumbu, Mavuto, Mdolo, Mpewe, Mumba, Tandwe, Wanda, ...
Wanda
This could be expecting too much from facilitators..they best is to use instructional technology which I guess could also be a problem to such learners..they need to be encouraged to find means of accessing services at ...
Really unfortunate to my rural student. It seems both technology and physical attendance are a challenge. Any way out for this set of students as far as field facilitation is concerned?
12:02 PM
Mdolo
I thought satellite centres are going to solve problem of long distances to Mzuzu. Now you are saying satellites are also difficult to access? Who would be paying for lecturer's travel costs?
12:29 PM
3/20/2020
You added Augustine
3/26/2020
You added Gulula
You added Tandwe
4/1/2020
Type a message
3:16 PM
7/14/2020


(1) Messenger | Facebook
Kalima Research Group 3
Angel, Augustine, Gulula, Kamoto, Kubwalo, Lungu, Luntha, Masumbu, Mavuto, Mdolo, Mpewe, Mumba, Tandwe, Wanda, ...
Tandwe
Ok
9:45 AM
4/25/2020
Mpewe changed their phone number to a new number.
+265 888 75 52 09 changed to +265 999 28 61 80
5/4/2020
Most of you field facilitators have said that students do not participate in
facilitation sessions after year one because by then they would have gained confidence to study on their own. However, lecturers are saying that this could be as a result of field facilitators having challenges to handle content beyond year one. Your reactions to this?
1:47 PM
Forwarded
Not necessarily, there are a lot of factors for LL I have noticed that mostly it's because of financial challenges to move from from their homes to where we meet, at our level sir, we can read their modules during preparation, understand and assist them as required because it's just reminding yourself. Besides that struggle can just happen for the first group then for the groups following an individual can be used to the work
1:49 PM
Type a message
3:21 PM
7/14/2020


(1) Messenger | Facebook
Kalima Research Group 3
Angel, Augustine, Gulula, Kamoto, Kubwalo, Lungu, Luntha, Masumbu, Mavuto, Mdolo, Mpewe, Mumba, Tandwe, Wanda, ...
Colleagues how do you look at these reactions from field facilitators?
1:51 PM
5/7/2020
Mpewe changed their phone number to a new number.
5/8/2020
+265 888 75 52 09 changed to +265 999 28 61 80
6/16/2020
Colleagues, my sincere appreciation for your contributions this far. However, I have another observation worth discussions. I think the absence or lack of knowledge of ODL policy is another factor affecting the execution of field facilitation. Your take on this?
2:11 PM
Mdolo
You
Colleagues, my sincere appreciation for your contributions this far. However, I have another observation worth discussions. I think the absence or lack of knowledge of ODL policy is another factor affecting the execution of field ...
Type a message
3:22 PM
7/14/2020


(1) Messenger | Facebook
Kalima Research Group 3
Angel, Augustine, Gulula, Kamoto, Kubwalo, Lungu, Luntha, Masumbu, Mavuto, Mdolo, Mpewe, Mumba, Tandwe, Wanda, ...
Mdolo
You
Colleagues, my sincere appreciation for your contributions this far. However, I have another observation worth discussions. I think the absence or lack of knowledge of ODL policy is another factor affecting the execution of field ...
I thought we have the ODL policy? Took part in developing it, may be not approved?
2:14 PM
Mdolo
I thought we have the ODL policy? Took part in developing it, may be not approved?
Thanks haven't seen it. Probably still in draft state. But even if its there I doubt if science and maths lecturers are aware and have seen it
2:18 PM
Mdolo
You
Thanks haven't seen it. Probably still in draft state. But even if its there I doubt if science and maths lecturers are aware and have seen it
Look for it and check what it has
4:28 PM
6/17/2020
Type a message
3:22 PM
7/14/2020


(1) Messenger | Facebook
Kalima Research Group 3
Angel, Augustine, Gulula, Kamoto, Kubwalo, Lungu, Luntha, Masumbu, Mavuto, Mdolo, Mpewe, Mumba, Tandwe, Wanda, ...
Forwarded
12:12 PM
12:12 PM
12:12 PM
12:12 PM
The diagrams represent our main activity system which eventually focuses on field facilitation support. It then attempts to identify tensions and conflicts in the system right away from the top which have been technically termed as contradictions. Would you please comment?
12:17 PM
If you feel uncomfortable you can as well inbox me
12:18 PM
6/30/2020
Type a message
3:23 PM
7/14/2020


(1) Messenger | Facebook
Kalima Research Group 3
Angel, Augustine, Gulula, Kamoto, Kubwalo, Lungu, Luntha, Masumbu, Mavuto, Mdolo, Mpewe, Mumba, Tandwe, Wanda, ...
12:12 PM
12:12 PM
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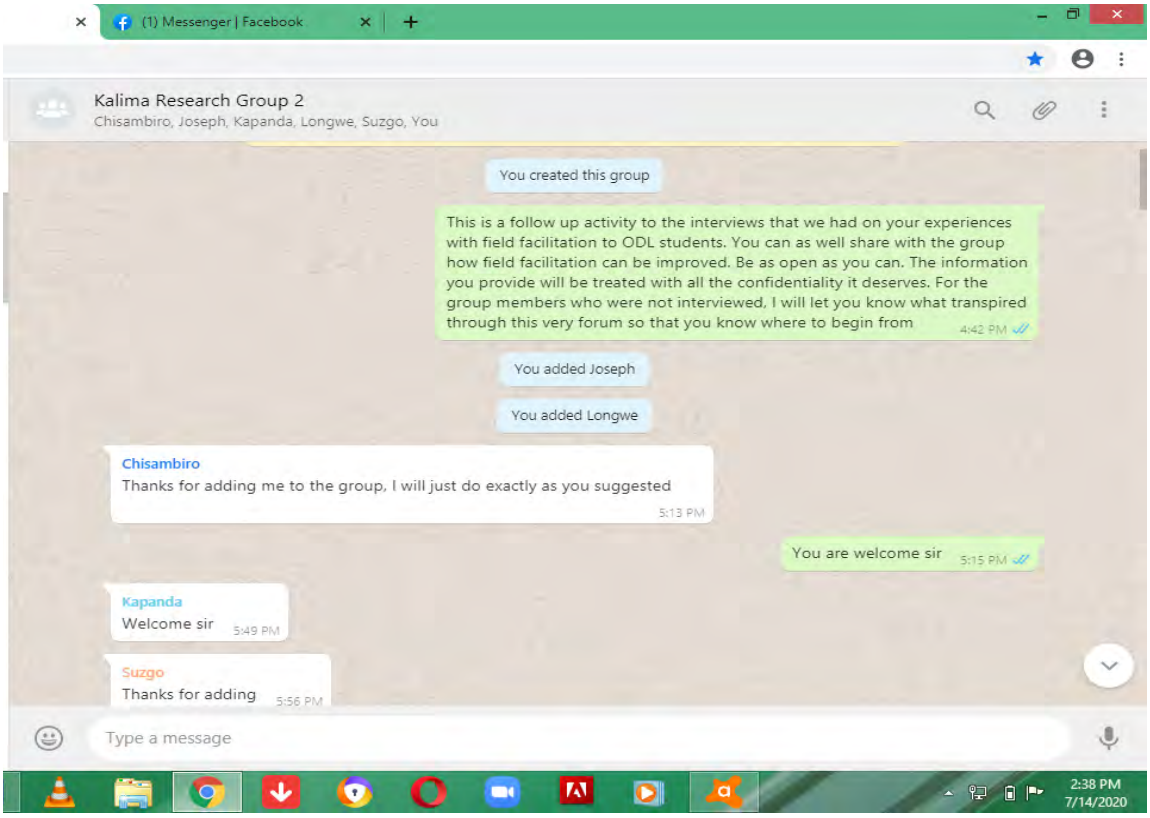
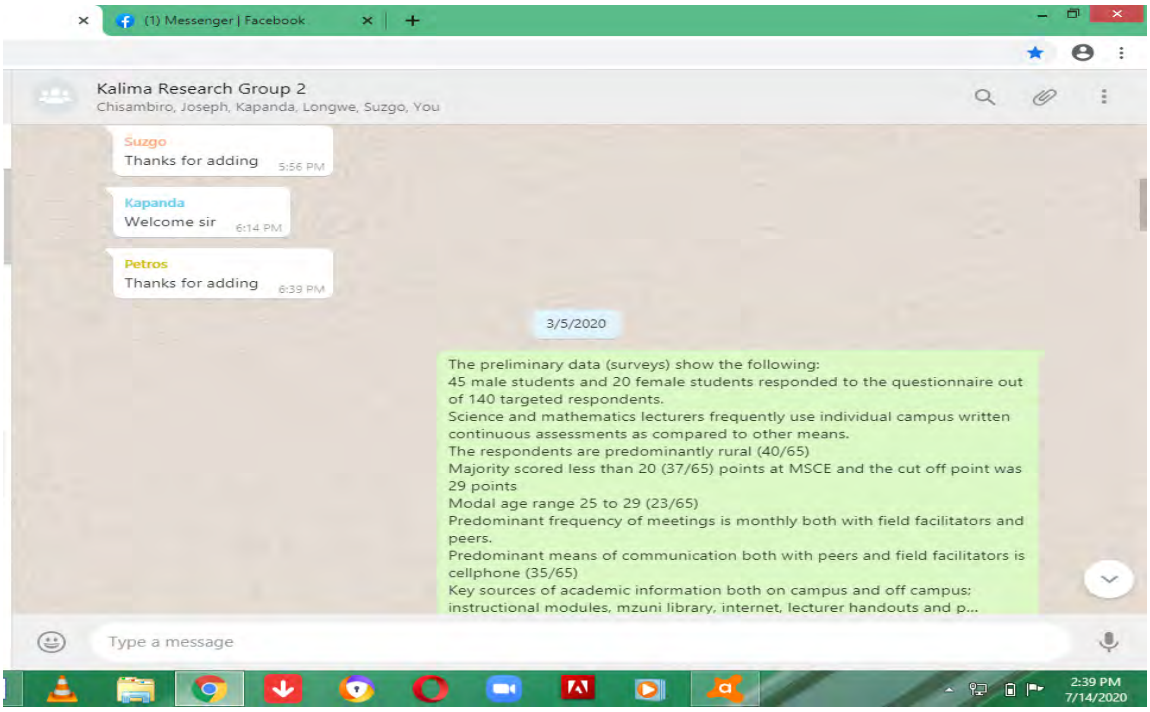
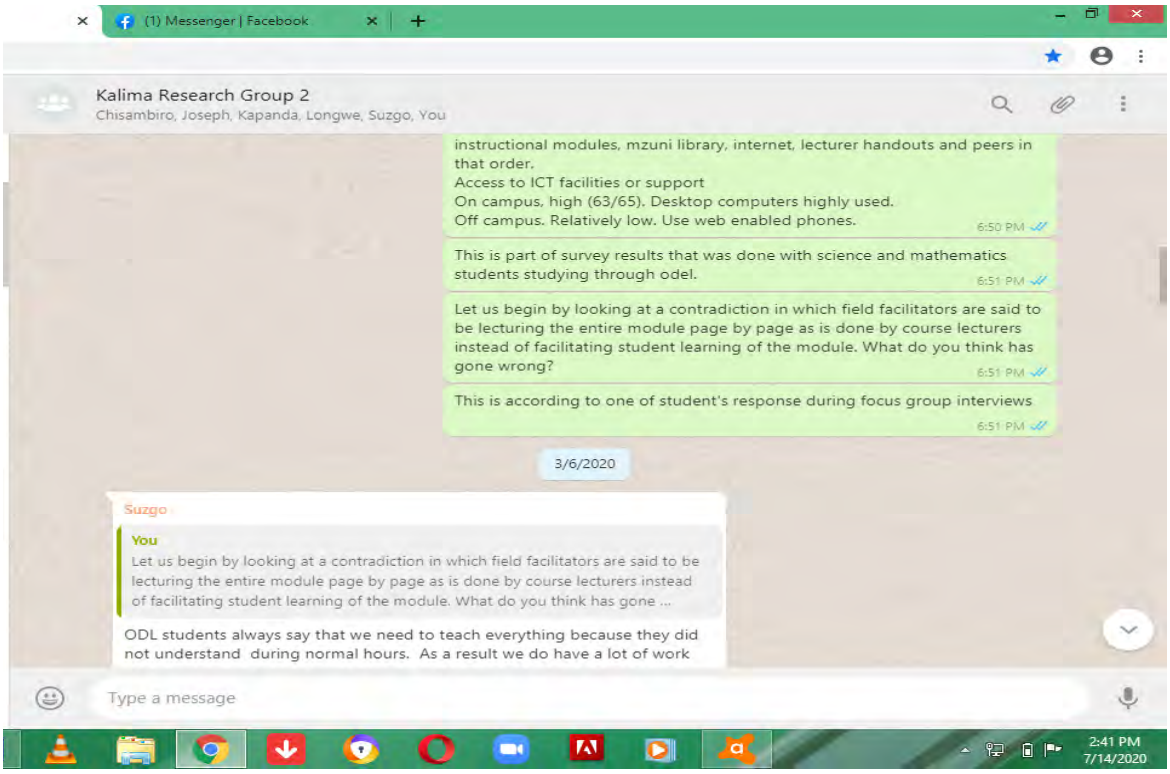
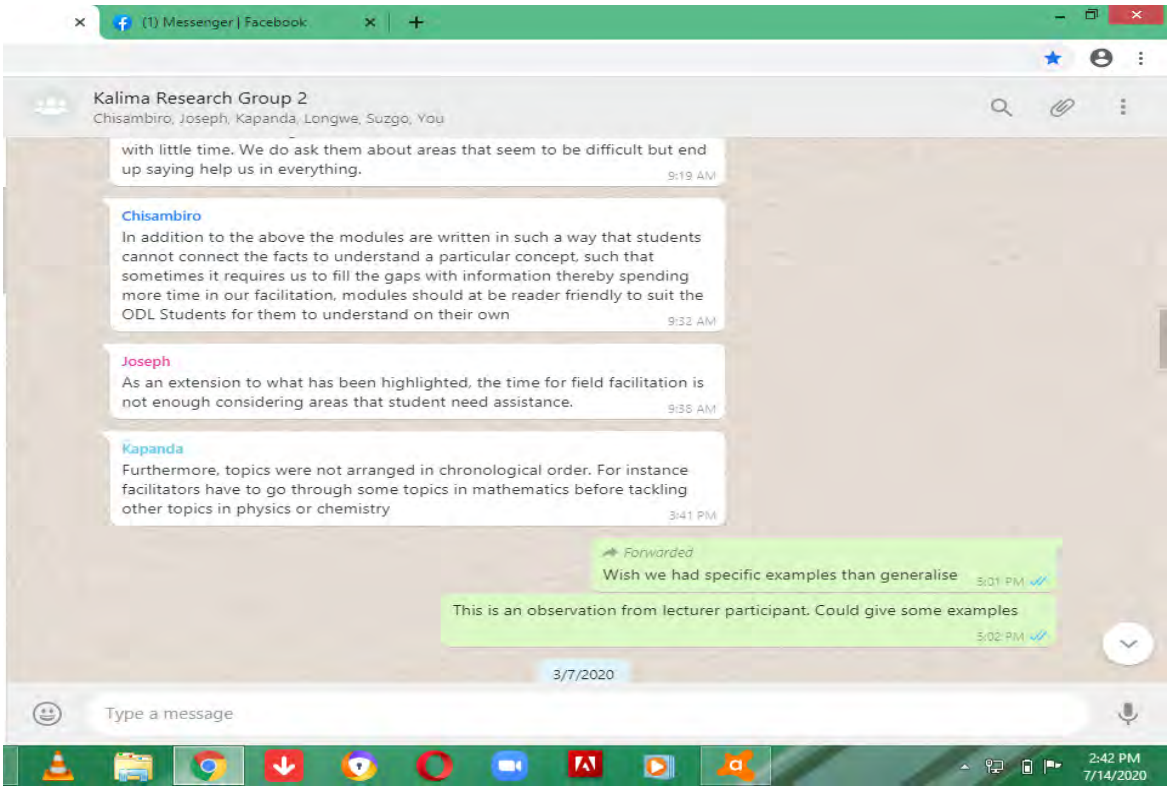
12:17 PM
If you feel uncomfortable you can as well inbox me
12:18 PM
6/30/2020
Forwarded
I feel the system its just okay, I gues the major task will be the filling in of the tensions and conflicts between players in the system. Luckily enough that is the whole essence of having it i.e identifying tensions and confusions between or within players in as far as field facilitation is concerned.
8:47 PM
So you are saying that if tensions exist, then they exist at lower level (individual) level otherwise the system is okay. I agree with you that there are conflicts at lowest level (individual), but there are also tensions at a higher level for example at secondary level between activity systems of the field facilitators and course facilitator activity systems
8:47 PM
Type a message
3:24 PM
7/14/2020

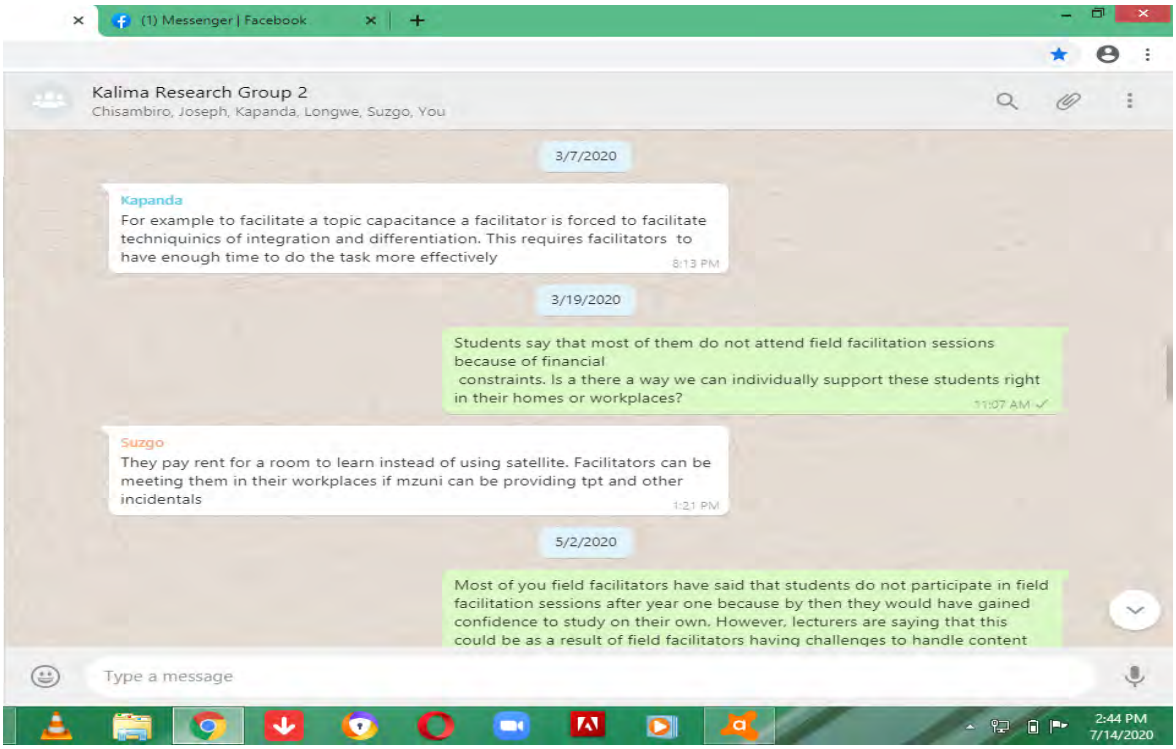
Appendix 11: Field facilitators' WhatsApp group discussion

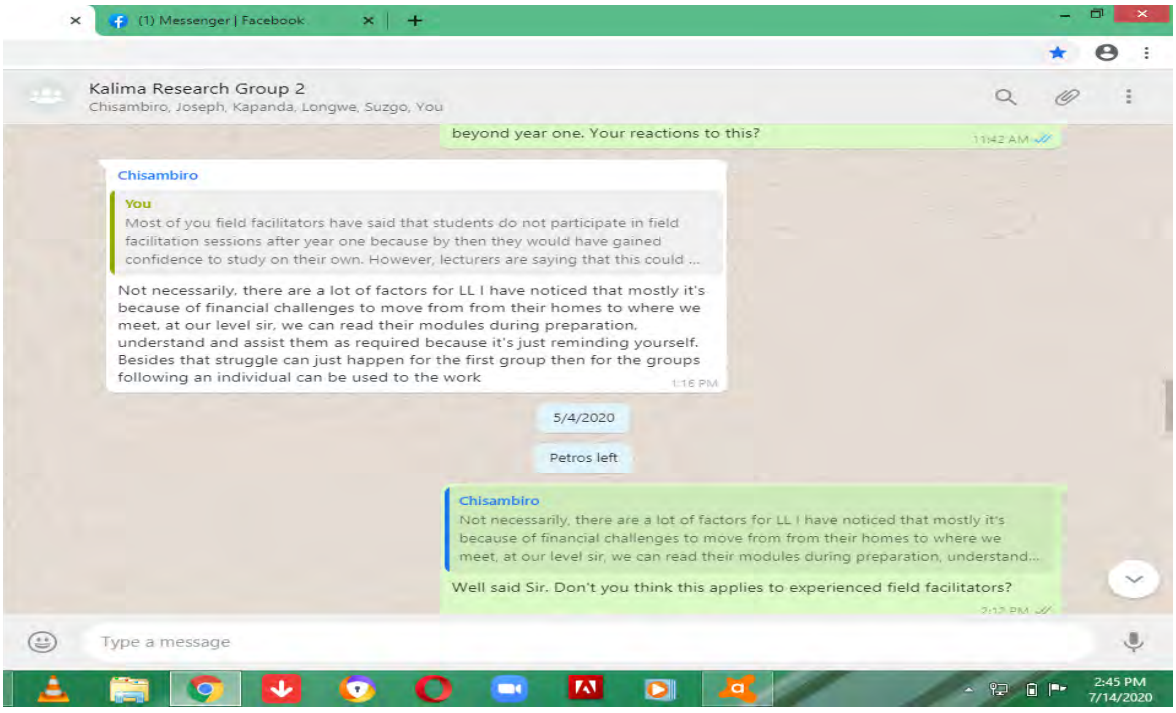





(1) Messenger | Facebook
Kalima Research Group 2
Chisambiro, Joseph, Kapanda, Longwe, Suzgo, You
instructional modules, mzuni library, internet, lecturer handouts and peers in that order.
Access to ICT facilities or support
On campus, high (63/65). Desktop computers highly used.
Off campus. Relatively low. Use web enabled phones.
6:50 PM
This is part of survey results that was done with science and mathematics students studying through odel.
6:51 PM
Let us begin by looking at a contradiction in which field facilitators are said to be lecturing the entire module page by page as is done by course lecturers instead of facilitating student learning of the module. What do you think has gone wrong?
6:51 PM
This is according to one of student's response during focus group interviews
6:51 PM
3/6/2020
Suzgo
You
Let us begin by looking at a contradiction in which field facilitators are said to be lecturing the entire module page by page as is done by course lecturers instead of facilitating student learning of the module. What do you think has gone ...
ODL students always say that we need to teach everything because they did not understand during normal hours. As a result we do have a lot of work
Type a message
2:41 PM
7/14/2020


(1) Messenger | Facebook
Kalima Research Group 2
Chisambiro, Joseph, Kapanda, Longwe, Suzgo, You
with little time. We do ask them about areas that seem to be difficult but end up saying help us in everything.
9:19 AM
Chisambiro
In addition to the above the modules are written in such a way that students cannot connect the facts to understand a particular concept, such that sometimes it requires us to fill the gaps with information thereby spending more time in our facilitation, modules should at be reader friendly to suit the ODL Students for them to understand on their own
9:32 AM
Joseph
As an extension to what has been highlighted, the time for field facilitation is not enough considering areas that student need assistance.
9:35 AM
Kapanda
Furthermore, topics were not arranged in chronological order. For instance facilitators have to go through some topics in mathematics before tackling other topics in physics or chemistry
3:41 PM
Forwarded
Wish we had specific examples than generalise
5:01 PM
This is an observation from lecturer participant. Could give some examples
5:02 PM
3/7/2020
Type a message
2:42 PM
7/14/2020


(1) Messenger | Facebook
Kalima Research Group 2
Chisambiro, Joseph, Kapanda, Longwe, Suzgo, You
3/7/2020
Kapanda
For example to facilitate a topic capacitance a facilitator is forced to facilitate techniquinics of integration and differentiation. This requires facilitators to have enough time to do the task more effectively
8:13 PM
3/19/2020
Students say that most of them do not attend field facilitation sessions because of financial constraints. Is a there a way we can individually support these students right in their homes or workplaces?
11:07 AM
Suzgo
They pay rent for a room to learn instead of using satellite. Facilitators can be meeting them in their workplaces if mzuni can be providing tpt and other incidentals
1:21 PM
5/2/2020
Most of you field facilitators have said that students do not participate in field facilitation sessions after year one because by then they would have gained confidence to study on their own. However, lecturers are saying that this could be as a result of field facilitators having challenges to handle content
Type a message
2:44 PM
7/14/2020


(1) Messenger | Facebook
Kalima Research Group 2
Chisambiro, Joseph, Kapanda, Longwe, Suzgo, You
beyond year one. Your reactions to this?
11:42 AM
Chisambiro
You
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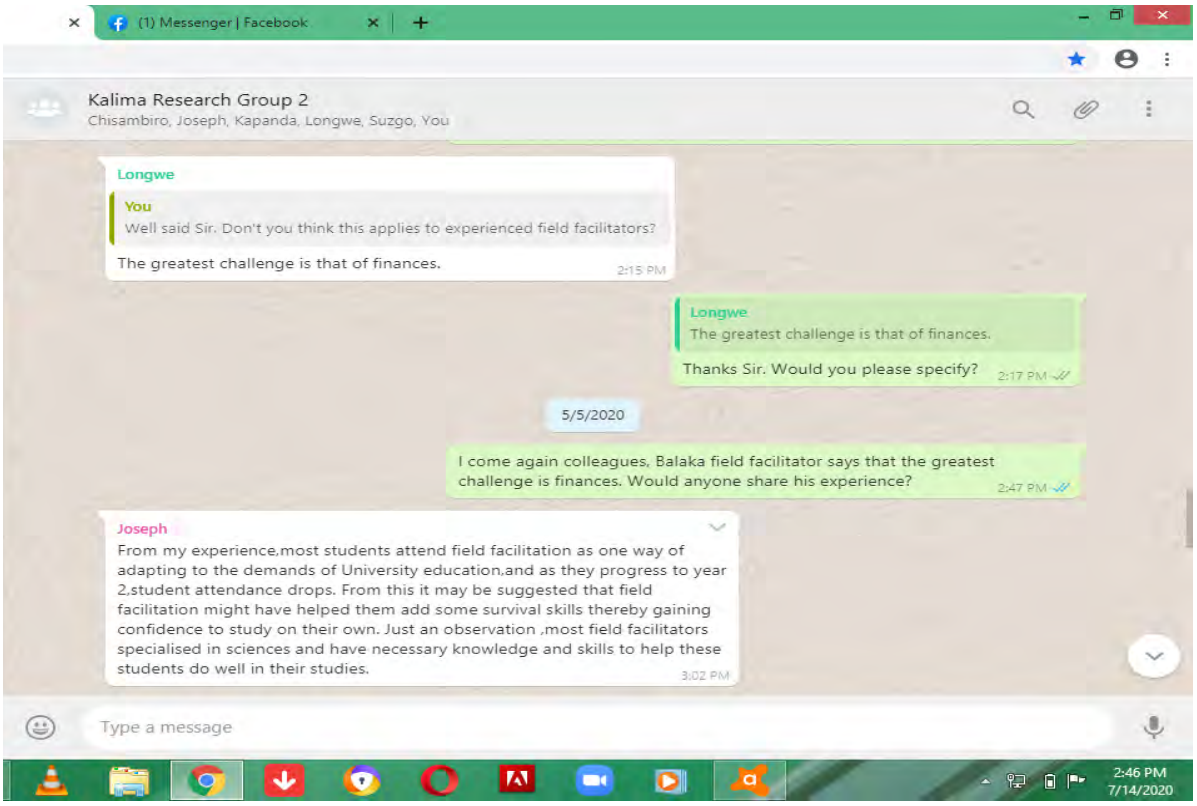
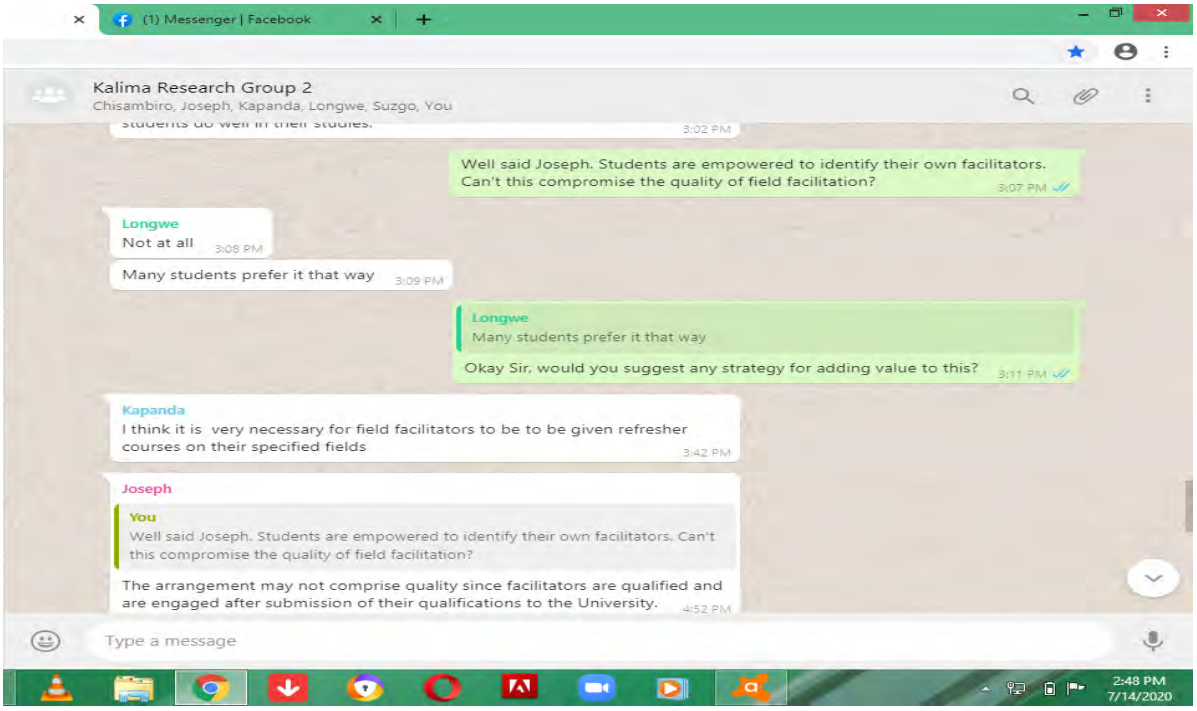
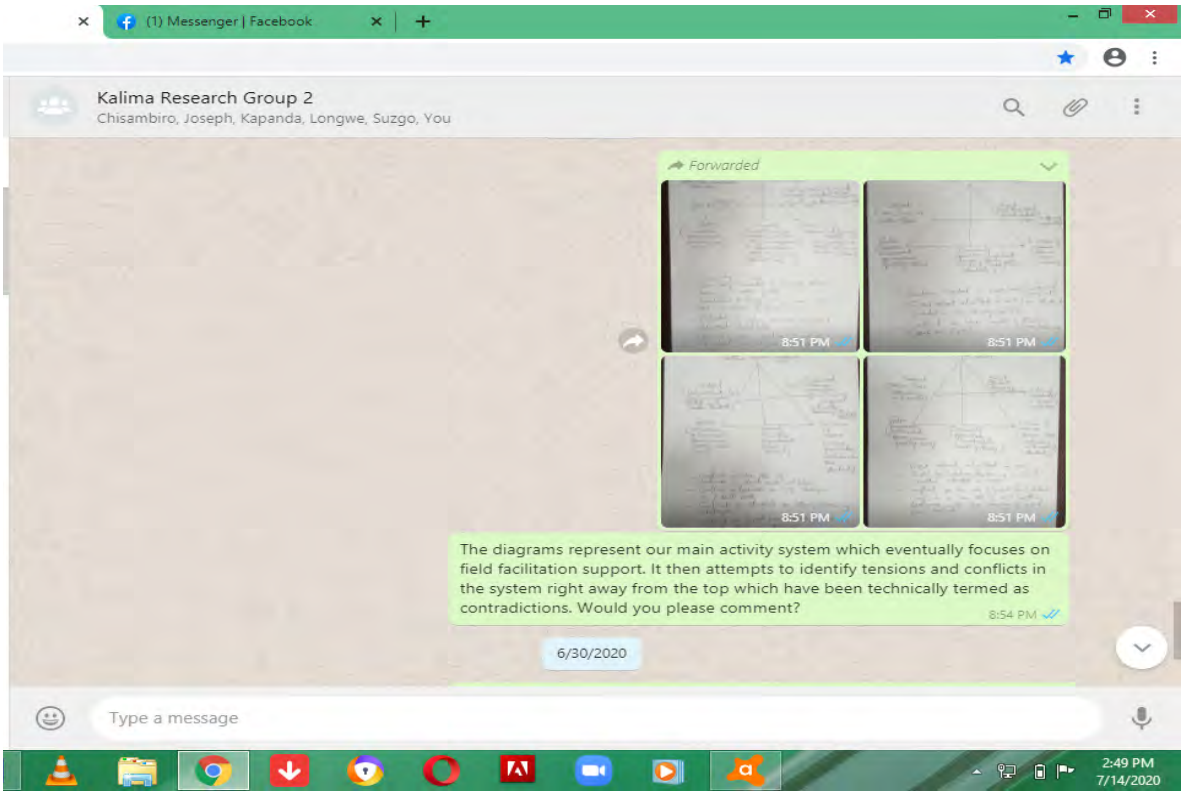
Not necessarily, there are a lot of factors for LL I have noticed that mostly it's because of financial challenges to move from from their homes to where we meet, at our level sir, we can read their modules during preparation, understand and assist them as required because it's just reminding yourself. Besides that struggle can just happen for the first group then for the groups following an individual can be used to the work
1:16 PM
5/4/2020
Petros left
Chisambiro
Not necessarily, there are a lot of factors for LL I have noticed that mostly it's because of financial challenges to move from from their homes to where we meet, at our level sir, we can read their modules during preparation, understand...
Well said Sir. Don't you think this applies to experienced field facilitators?
Type a message
2:45 PM
7/14/2020


(1) Messenger | Facebook
Kalima Research Group 2
Chisambiro, Joseph, Kapanda, Longwe, Suzgo, You
Longwe
You
Well said Sir. Don't you think this applies to experienced field facilitators?
The greatest challenge is that of finances.
2:15 PM
Longwe
The greatest challenge is that of finances.
Thanks Sir. Would you please specify?
2:17 PM
5/5/2020
I come again colleagues, Balaka field facilitator says that the greatest challenge is finances. Would anyone share his experience?
2:47 PM
Joseph
From my experience,most students attend field facilitation as one way of adapting to the demands of University education,and as they progress to year 2,student attendance drops. From this it may be suggested that field facilitation might have helped them add some survival skills thereby gaining confidence to study on their own. Just an observation ,most field facilitators specialised in sciences and have necessary knowledge and skills to help these students do well in their studies.
3:02 PM
Type a message
2:46 PM
7/14/2020


(1) Messenger | Facebook
Kalima Research Group 2
Chisambiro, Joseph, Kapanda, Longwe, Suzgo, You
3:02 PM
Well said Joseph. Students are empowered to identify their own facilitators. Can't this compromise the quality of field facilitation?
3:07 PM
Longwe
Not at all
3:08 PM
Many students prefer it that way
3:09 PM
Longwe
Many students prefer it that way
Okay Sir, would you suggest any strategy for adding value to this?
3:11 PM
Kapanda
I think it is very necessary for field facilitators to be to be given refresher courses on their specified fields
3:42 PM
Joseph
You
Well said Joseph. Students are empowered to identify their own facilitators. Can't this compromise the quality of field facilitation?
The arrangement may not comprise quality since facilitators are qualified and are engaged after submission of their qualifications to the University.
4:52 PM
Type a message
2:48 PM
7/14/2020


(1) Messenger | Facebook
Kalima Research Group 2
Chisambiro, Joseph, Kapanda, Longwe, Suzgo, You
Forwarded
8:51 PM
8:51 PM
8:51 PM
8:51 PM
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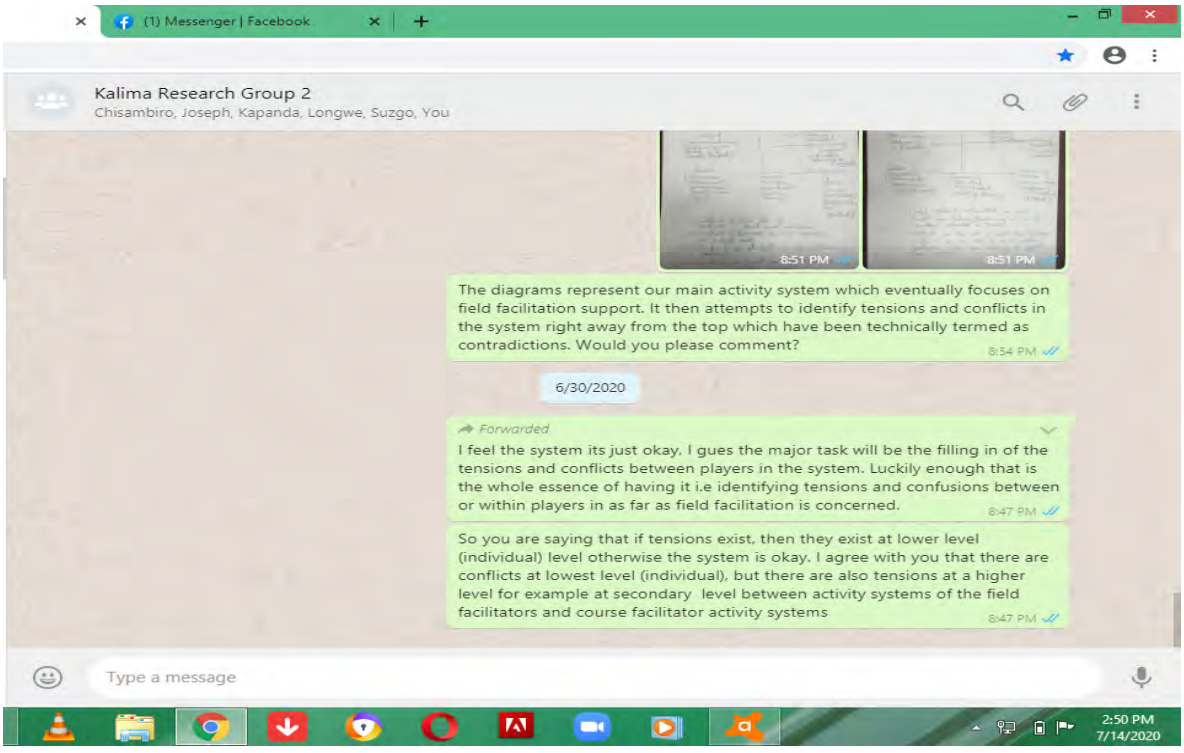
8:54 PM
6/30/2020
Type a message
2:49 PM
7/14/2020


(1) Messenger | Facebook
Kalima Research Group 2
Chisambiro, Joseph, Kapanda, Longwe, Suzgo, You
8:51 PM
8:51 PM
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8:54 PM
6/30/2020
Forwarded
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8:47 PM
So you are saying that if tensions exist, then they exist at lower level (individual) level otherwise the system is okay. I agree with you that there are conflicts at lowest level (individual), but there are also tensions at a higher level for example at secondary level between activity systems of the field facilitators and course facilitator activity systems
8:47 PM
Type a message
2:50 PM
7/14/2020

Appendix 12: Ethical approval by the Faculty of Education Higher Degrees Committee

RHODES UNIVERSITY
Grahamstown • 6140 • South Africa

EDUCATION FACULTY • PO Box 94, Grahamstown, 6140
Tel: (046) 603 8385 / (046) 603 8393 • Fax: (046) 622 8028 • e-mail: d.wilmot@ru.ac.za

PROPOSAL AND ETHICAL CLEARANCE APPROVAL

Ethical clearance number 2018.5.03.01

The minute of the EHDC meeting of 6 September 2018 reflect the following:

2018.5.03 CLASS A RESTRICTED MATTERS
DOCTOR OF PHILOSOPHY RESEARCH PROPOSALS

To consider the following research proposal for the degree of PhD (Education) in the Faculty of Education:

Kalima, Robert (17K9781)

Topic: Exploring field facilitation strategies in a Bachelor of Education Science programme under ODL mode of delivery at Mzuzu University in Malawi.

Supervisor: Professor C Grant
Co-Supervisors: Dr S Clarence

Decision: *Approved*

This letter confirms the approval of the above proposal at a meeting of the Faculty of Education Higher Degrees' Committee on the 6 September 2018.

The proposal demonstrates an awareness of ethical responsibilities and a commitment to ethical research processes. The approval of the proposal by the committee thus constitutes ethical clearance.

Sincerely

Prof Marc Schäfer
Chair of the EHDC, Rhodes University
5th October 2018