

# An Aerial Insight on Physiotherapy Training in the University of Namibia during Covid-19 era

Farirai Evelyn Kamba<sup>1</sup>, Lukas Matati Josua<sup>2</sup> and Rakel Kavena Shalyefu<sup>3</sup>

<sup>1</sup> Department of Occupational Therapy and Physiotherapy, University of Namibia  
Windhoek, Namibia  
Email: [fkamba@unam.na](mailto:fkamba@unam.na)

<sup>2</sup> Department of Higher Education and Lifelong Learning, University of Namibia  
Oshakati, Namibia  
Email: [ljosua@unam.na](mailto:ljosua@unam.na)

<sup>3</sup> Department of Higher Education and Lifelong Learning, University of Namibia  
Windhoek, Namibia  
Email: [rkshalyefu@unam.na](mailto:rkshalyefu@unam.na)

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**ABSTRACT**— *Teaching and learning in higher education context around the globe witnessed unique disturbances during the COVID-19 induced calamity. The educators had to adjust their old ways of teaching and learning in order to halt the spread of the deadly virus. In the University of Namibia, the physiotherapy training, despite its practicality, is not pardoned from virus induced transformation. These rapid transformation and migration to technology assisted pedagogies introduced new ways of normal. Therefore, higher education institutions are challenged to rethink of the way they will conduct educational activities post-COVID-19 era. This review paper focused on enabling teaching and learning in physiotherapy training during the COVID-19 at the University of Namibia and chart the way forward post-COVID-19.*

**Keywords**— Physiotherapy training, University of Namibia, COVID-19, Teaching and learning

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## 1. INTRODUCTION

Higher education institutions around the globe experienced unprecedented disruption during the COVID-19 pandemic and as a result, physiotherapy (PT) training, whose practical nature traditionally demands contact or face-to-face teaching (Rossetini et al., 2021; Divanoglou et al., 2018), was thrown into disarray. In Namibia, PT students persevered and experienced reasonable success in transitioning from traditional face-to-face pedagogies to online learning as necessitated by the COVID-19 pandemic. These students faced several challenges namely, the cost linked to internet connectivity, acquiring devices which were compatible with the learning management system, reduced contact time with lecturers and classmates, inefficient communication between students and lecturers, lack of funds due to the economic status of the students and their families and lack of technological, pedagogic and content knowledge among students and teachers. Some students and lecturers expressed that they felt demotivated and indicated that academic progress was slow due to the unfamiliar isolation that they found themselves in, as opposed to the familiar social experience that they were used to in class.

The introduction of online pedagogies came at a time when not all institutions were ready to roll out online teaching and learning. Lecturers used their creativity to simulate the students' familiar face-to-face classroom using various online learning platforms at their disposal but practical clinical training came to a complete standstill because at that time, the risk of spreading the virus from having many students in the hospital setting had not yet been ascertained. Lecturers enabled the students to progress with their learning and assessment of the theoretical aspects of the PT programme however, the success of this teaching was uncertain as traditional pedagogies were being applied to an online mode of teaching which required different pedagogies. In addition, not all lecturers, had previously had the chance to facilitate online pedagogies before the pandemic forced migration to online teaching. Despite making strides in teaching the theoretical components, teaching the practical aspects of the PT programme was a real challenge. However, after this event both staff and students have taken major strides and made progress with navigating minor technological challenges. Therefore, the purpose of this essay is to investigate the current learning technologies that are being used for PT training, as this has continued in the post COVID-19 era, and how they can be applied to PT training in the Namibian context. At the onset, the essay delves into a discussion of contextual factors in higher education as they funnel from global to departmental factors.

## **2. FUNNEL PRESENTATION OF FACTORS IN HIGHER EDUCATION CONTEXT**

### ***2.1 International higher education context***

Before the COVID-19 pandemic, it never occurred to the lecturers in the PT department at UNAM that global changes may influence the academic work in the department. Late 2019, the international news media reported the emergence of a virus detected in the City of Wuhan in the Hubei province in China (Zhu at al., 2020). This viral outbreak was declared a global pandemic by the World Health Organisation (WHO) and governments were asked to put measures in place to curb the spread of the virus from person to person. Measures such as social distancing, avoiding human contact, wearing of face masks in public, hand washing and sanitising, were some of the strategies employed to prevent the spread of the potentially deadly infection. Declaring COVID-19 as a “pandemic” denoted the serious threat to human life and health the virus posed globally. Namibia was not spared from the social, economic, cultural and health devastation that the pandemic wreaked on the citizens of the globe.

In higher education institutions, the option of migrating lessons from face-to-face to online mode of teaching, learning and assessment were explored and implemented in an attempt to enable continuity of imparting of knowledge to the students with as little disruption as possible. This was facilitated by the Information Communication and Technology (ICT) revolution experienced with advent of the 4th industrial revolution. This migration from traditional teaching and learning towards technology induced teaching and learning morphed the work of enabling epistemological access between teachers and students in many ways. At the University of Namibia (UNAM) this migration came at a time when the university had introduced online and distance courses that were facilitated using the Learning Management System (LMS) Moodle. Fortunately, this foresight meant the institution had done some foundational work on the LMS, which meant it only needed some adaptation before being rolled out to all academic staff including those who had never used it before. Therefore, at the time when Moodle was chosen as the tool to enable teaching, learning and assessment during the lockdowns, some of the teaching staff were already familiar with the platform.

For the students who now had to pursue their studies online, this was a valuable step towards them using emerging learning technologies that could potentially propel them to attaining internationally recognised graduate attributes that would enable them to be competent practitioners in the global context.

### ***2.2 National higher education context***

The Ministry of Health and Social Services (MOHSS) in Namibia has an inadequate number of registered physiotherapists in state hospitals where the majority of the population seek healthcare services. State facilities collectively have less than one physiotherapist per 10,000 of the population (Tamang & Dorji, 2021). The process of treating and rehabilitating COVID-19 patients, requires the services of physiotherapists whose interventions play an important part in the positive prognosis of patients. The general lack of physiotherapists in Namibia led to the introduction of the PT programme offered at the UNAM becoming a priority which was further supported and strengthened by the realisation that COVID-19 may remain for much longer than anticipated and be a recurrent situation. In order to produce more graduates from the programme, increased financial commitment as well as staff recruitment are challenges that need to be addressed. Attempts to increase the number of students enrolled for the programme were made in order to increase PT capacity however, the available two training hospitals are not able to support the massification of PT training and therefore the HPCNA allows an enrollment of approximately 15 PT students only per year. The PT programme is offered at only one university campus located in the Capital City, Windhoek where the two state hospitals support the clinical training of PT students. This is therefore a major constraint to capacity building.

The Personal Protective Equipment (PPE) required by students during clinical training as well as funds were mobilised and provided by the MOHSS. Simultaneously, UNAM academic staff took to the hospitals to supervise clinical training at the hospitals. Students benefited immensely from these initiatives, through the existing MOU between MOHSS and UNAM, because they were taught correct and detailed infection control procedures which have the potential to reduce hospital cross infections as well as prevent the students themselves from getting infected whilst working in the hospitals.

This collaboration also reaped positive benefits in the sense that the clinical training increased the number of patients getting access to physiotherapy services. The increased workload however, has a negative impact in terms of the toll it takes on the academic staff who provide clinical supervision to the students working in the hospitals. Subsequently, this then has a negative impact on the academic work of the lecturers because their time for preparation of teaching activities is significantly reduced. Although, there are physiotherapists in private practice, historical differences have constrained support with clinical training from the Namibian Society of Physiotherapy (NSP). The University of Namibia’s PT department has actively engaged the NSP in an effort to address this anomaly by involving them, as stakeholders in curriculum development, clinical supervision, clinical workshops and assessing student learning. Financial benefits tend

to drive physiotherapists into private practice and therefore, remuneration for physiotherapists in state facilities needs to become market related while creating vacancies that graduates will find remuneratively fulfilling in order to retain them. This has the potential to increase the availability of registered physiotherapists who can conduct student clinical supervision in state hospitals around all political regions of the country. Communication between stakeholders is an enabling mechanism, which needs to include the Public Service Commission (PSC). It is recommended that a line of communication between UNAM and PSC should be opened up to facilitate the cordial working relationship amongst the relevant institutions.

Historically, the Namibian community has relied on the work of community health workers to address the challenges people living with disability face. The challenges range from stigma, rejection and isolation. Community health workers have a key function to keep communities informed that disability is not inability and therefore a person who is differently abled has a role to play in their society and community. These community health workers have previously been denied a chance to study further due to stringent entry requirements as well as non-availability of Mature Age Entry or recognition of prior learning as an option for entering higher education spectrum in the physiotherapy discipline. It is ideal to provide study opportunities to individuals, who have maintained interest and practice in the field and avoid entry limitations to study towards a higher qualification in the areas that they have been practicing with dedication for many years.

The Health Professions Council of Namibia (HPCNA) guides PT curriculum content as for all other health related professions in Namibia. This regulatory body also requires that PT graduates must be registered with the HPCNA in order to be able to practice after graduating (MOHSS, 2010), and this registration is renewable on a yearly basis. Teaching staff are also obliged to maintain registration every academic year with the HPCNA, without which they are not able to supervise students during clinical placements. The academics should use varied teaching and learning methods that ultimately enable students to practice in a variety of different contexts. For instance, the practical training rooms at UNAM are well equipped with most of the equipment frequently used in PT practice. However, when the students work in a hospital or community setting, they need to be able to be innovative in order to still manage their patients as effectively. In a different context, students are expected to “think outside of the box” and use their creativity to devise ways to manage patients without some of the equipment that they have been exposed to while at UNAM. The need to respond to these gaps in availability of resources, provides students with creative thinking opportunities to address the limitations of the hospital setting while transforming service delivery to the patients.

### ***2.3 Organisational higher education context***

As the COVID-19 pandemic spread, institutional management moved to request all academic staff to attend training, so that they could become highly proficient with using Moodle to facilitate teaching, learning and assessment. The academics then became trainers-of-trainees in that they then trained the students to use the LMS to access online materials, assignments, tests and examinations. This training was all conducted at the time when human contact and social gathering were not permitted by governments around the world. It was at this time that it seemed impossible to teach practical PT skills online but this perception may have been partly due to the fact that this was uncharted territory. However, the training of physiotherapists had to continue as it was influenced by the increased call to build PT capacity nationally and also because the profession plays a major role in the management of patients with COVID-19.

### ***2.4 Unit or departmental higher education context***

The Faculty of Health Science and Veterinary Medicine as well as in the PT department has staff compliment from various cultural orientations who bring a diverse wealth of knowledge and skills. Additionally, the students that are enrolled in the PT programme are from different regions within Namibia, which provides ethnic, political, cultural, social and economic diversity within the department. There are also a few international students enrolled in the programme. Therefore, the student profiling exercise is pivotal in revealing the diversity among the PT student population. Student profiling reveals some of the factors that can potentially constrain effective teaching, learning and assessment exist among this diverse group of students. Investing time in familiarisation with the student diversity, enables the teaching agents to understand and devise appropriate strategies to address potential hinderances to effective teaching, learning and assessment. The diversity of race, gender or ethnicity have an influence on teaching, learning and assessment interactions with students during online learning.

During the pandemic, many students especially those pursuing their studies via face-to-face contact sessions like the PT students, had difficulties in adapting to the online teaching, learning and assessment mode due to several reasons. Students either had devices which were not compatible with Moodle and therefore they did not have access to the full functionality of Moodle or some students had no devices at all. Poor connectivity due to geographical location and the high cost associated with purchasing data also hindered students’ progress with their learning. In PT discipline where the students’ learning relied heavily on being taught practical skills, teaching seemed impossible because the training

predominantly used demonstration as a method to enable effective learning in the discipline. In addition, students and lecturers had no access to the teaching hospitals during this time. Practical demonstration followed by practice and instant feedback has been found to be an effective method of teaching and learning practical skills.

The University of Stellenbosch PT curriculum was initially adopted and adapted to create the UNAM PT curriculum as part of the memorandum of understanding between the two institutions when the programme started in 2018. The University of Namibia's 2022 restructuring and curriculum transformation processes, enabled agents in the PT department to seize the opportunity to make changes to the curriculum that would enable effective and aligned teaching, learning and assessment. Previously, this transformational process had been lengthy due to administrative bureaucracy and the many structures involved in the process before approval by the university Senate. Unfortunately, the time frame within which curriculum transformation was to be completed was not sufficient to effect all the necessary changes and the committee that was tasked with this process was at the time not highly experienced with the process so that soon after the curriculum transformation process was completed, further revision of the curriculum was already necessary. Although this could be seen as a setback to progress with the programme, the advent of COVID-19 has turned this into an opportunity to consider incorporating learning technologies even as we are being warned of possible future pandemics.

### **3. TRAINING OF PHYSIOTHERAPISTS AT THE UNIVERSITY OF NAMIBIA**

PT training equips physiotherapists with skills and competencies to treat and manage a wide range of pathologies using physical means. As stated by Pappa and Papadopoulos (2019), physiotherapists' role is to "analyse and assess the functional and physical state of a person, treat by movement, physical factors, compensate disability, guarantee health care and prevention, and stimulate and educate healthy living" (p: 59). The training process is multifaceted and complex, and involves integration of knowledge systems ranging from theory taken from biomedical sciences and practical experience with a diverse population of patients.

Also, the students deal with the mental and social aspects of every individual patient, which requires different ways to manage the patient as per their individual needs. Once the students complete their studies, it is expected that the graduates will have developed professional attributes relevant to the profession, including that of becoming lifelong learners who can keep up to date with the ever-changing professional practice (Pappa & Papadopoulos, 2019).

### **4. DIGITALLY-ENABLED EDUCATION**

The COVID-19 outbreak facilitated the migration of instructional activities to online mode using digital technology. The shift was one of the measures employed to ensure teaching and learning continued while halting the spread of the virus from person to person. Rossetini et al. (2021) describe digital education as requiring consistent reflection on the pedagogic process of using ICT as a means to link students and instructors who are geographically and physically separated. The teaching and learning may be synchronous or asynchronous and this enables students to learn from anywhere and at any time that they choose. It requires students to be self-disciplined and self-driven learners if they are to benefit from digitally-enabled teaching, learning and assessment. Technology assisted learning such as blended learning, E-learning and Massive Open Online Courses (MOOC) are still commonly used in the post COVID-19 era to facilitate learning. Literature is available on the effectiveness of digital teaching, learning and assessment as compared to traditional face-to-face teaching, learning and assessment in physiotherapy training. According to Tomesko et al. (2017), there is no conclusion on which of the two modes enhances effective teaching, learning and assessment of PT more.

However, a blended learning approach seems to be equally and at times more effective in terms of knowledge and practical skills mastered by physiotherapy students. This positive aspect of blended learning has been partially attributed to the fact that constructive alignment can successfully be embedded into this teaching approach (Ødegaard et al., 2021). When comparing the three distinct approaches used in PT practical skills, Maloney et al. (2013) considered traditional classroom teaching, pre-recorded video tutorials and students recording videos of their own practical skills. When the students were examined via Objective Structured Clinical Examination (OSCE), there were no significant differences found in the clinical performance of the three groups. The students rated the pre-recorded video tutorials as well as the self-recorded videos to have more educational value than the face-to-face facilitated teaching and learning. This may have been due to students being acquainted with video technologies and viewing the world from that technological perspective.

Despite the difference between face-to-face and online pedagogies, it is worth noting that the principles of face-to-face teaching are similar in some ways when compared to online pedagogies. Online teaching, learning and assessment content may be "chunked" into manageable pieces for the student. One major advantage of using online learning technologies such as the Modular Object-Oriented Dynamic Learning Environment's (Moodle) LMS for assessment is that students can be tested on the use of high order thinking and creativity skills because assessment is then not limited to

simply remembering and recalling information in the short term, as applies to low order thinking categories (Vaughan, 2012).

## **5. GAMING AND IMMERSION TECHNOLOGIES**

According to Pappa and Papadopoulos (2019) the facilitation of physiotherapy training can be enabled using advanced gaming and immersion technologies which simulate the real-life context and therefore allowing some of the traditional learning approaches to be used. Pappa and Papadopoulos propose a game based professional education model that applies various concepts of traditional face-to-face learning and teaching while enhancing them simultaneously. For instance, reality is an important component of pedagogies thus it is proposed that the model includes the practice of realism, which subsequently promotes problem-based teaching and learning as in real life situations.

Game-based learning motivates students and achievement of learning outcomes among participants appears to be greater when compared to that of students who receive face-to-face teaching (Molina-Torres et al., 2021). The students engage in personalised reflection of their experiences, which enables them to go through the decision-making process. Students also receive instant feedback that is imbedded within the game. Activities within the game align with the learning outcomes, thus; the level of the game at which the student must start their learning is determined by the learning outcomes they will have achieved in their previous sessions. Through game-based learning students have an opportunity to actively participate in the learning process and experience where the student is at the center of the process. According to Romrell et al. (2014), game-based learning is a complete redefinition of learning using a different pedagogical approach according to the modification and redefinition levels of the SAMR (Substitution, Augmentation, Modification, and Redefinition) model. Although most students in the PT programme in Namibia seem to be familiar with gaming to some extent, training the students to use gaming technology for learning would be necessary but the cost implications of such technology are unclear at present. It remains a possibility however that game-based learning may be a viable option to enhance teaching and learning among PT students at UNAM.

## **6. THE 3D TECHNOLOGY AND M-LEARNING**

The PT students have benefited from the use of computer assisted which enables students to visualise different parts of the human body as 3D images and also their position in relation to each other within the human body. According to UNAM Forum online (2022), UNAM school of medicine has used 3D printing technology to print 3D models of different parts of the human body which have been used for teaching anatomy. This is the only 3D image visualisation learning technology that has been used at UNAM thus far.

Noguera et al. (2013) developed the one of the first learning applications using 3D technology that could be used in mobile devices so that students could refer to it during clinical training. The 3D technology displays digital three-dimensional views of anatomical structures. It can be used “to achieve a sense of depth and three-dimensionality in anatomical visualisations” (Silén et al., 2022, p: 2). The 3D images are easily recognisable and students do not need to construct their own mental image of the model therefore reducing cognitive loading. The reduction of cognitive loading raises the question though of the duration that the acquired knowledge is consolidated and retained. Students who preferentially depend on a visual learning style may find the 3D learning technology to be an effective method of learning. For such students, this technology may better facilitate the long-term retention of information learnt.

M-Learning is well suited for the Namibian context because many students own mobile devices where the relevant technology is easily accessible. The devices can house multiple applications that can be used to enhance effective teaching and learning of clinical reasoning skills in PT. A randomised control trial, which was conducted by Fernández-Lao et al. (2016) investigated whether m-learning was useful in assisting PT students with learning practical skills. The results of this study were promising and suggested that when m-learning was used to complement traditional classroom learning, it was effective in helping PT students to acquire palpation skills.

## **7. THE WAY FORWARD**

The shortage of physiotherapists in Namibia, highlights the need to train more personnel in order to cater for the increased demand for PT services. Medical interventions and therapies have enabled people to live longer and coupled with increased lifespan is the need for habilitation and rehabilitation services within most communities in almost all the stages of the lifespan. The shortage of Physiotherapists also means that there is an inadequate staff who are available to train PT students and PT training is human resource intensive by nature due to the direct teaching of practical and clinical skills that is required. In the Namibian context, PT training and services are mostly limited to urban areas which leaves a large proportion of the population both without opportunities to train as a physiotherapist as well as to access PT services.

One way to address this deficiency would be to use a combination of learning technologies that facilitate the acquisition of theoretical knowledge as well as practical skills to escalate the training of Physiotherapists, although there are availability gaps, the expansion and evolution of technological capabilities in Namibia is growing exponentially as in other parts of the world. The types of "patients", clinical scenarios and settings is potentially endless depending on the technology used, but guidance from the UNAM PT curriculum must be used to streamline required content and tailor it to the local context. Much research has been done on the use of simulation technologies and other learning technologies and the evidence points to the fact that these technologies do enhance learning and the acquisition of clinical skills in PT training. In the Namibian context, the use of learning technologies such as simulation, would also reduce the need for unskilled students to practice PT techniques repeatedly on real patients which at times raises many ethical issues. A potential decrease in constant direct teaching of theoretical, practical and clinical content would be beneficial in the sense that training could then be conducted with less staff.

A curriculum that combines online learning, eLearning, m-learning and gaming technology has the potential to be cost effective in the Namibian context whilst using varied pedagogies. The sum of which may be more beneficial in promoting student-driven learning to facilitate the complex, multifaceted learning process required in PT training. Student motivation to learn is a real challenge that needs to be overcome and gaming, which is an activity that the younger generation enjoys may be a way to revolutionise and inject enthusiasm and enabling students to take ownership of their learning in Namibia. Setting up such a curriculum (possibly with input from the students) at the only campus where PT training is conducted in Namibia and conducting research to develop the concept, would eventually allow such a curriculum or model to be used in remote areas of the country, thus taking both PT education and PT services to places within the Namibian borders which previously would have had no access as well as to other low resource countries that may benefit from adopting such a model. In addition, making such a training facility available through an institution of higher education would promote access to many instead of a few elites.

## 8. CONCLUSION

The Center for Innovation Learning and Teaching (CILT) at UNAM facilitates on ongoing professional learning opportunities at to strengthen lecturers' knowledge and use of digital technology in teaching, learning and assessment. Digital education also requires extensive planning on the part of the educators and this can lead to them having an excessive workload. Rossetini et al. (2021) also refer to the potential for "social inequality and digital divide" to develop as a result of the predominant use of learning technologies, therefore creating an inequitable learning environment. Assessment methods would need to be revamped in order to align with the relevant teaching methods used through learning technologies.

Learning technologies provide students with a different perspective from the classroom environment which may enhance a student's understanding of the content they need to learn. The 3D printing technology and variations of m-learning are already in use at UNAM for training students learning the healthcare professions. Although in the short term it is time consuming for educators to set up digital education platforms, in the long term this could be a mean to reducing the face-to-face teaching hours in physiotherapy training, which is highly human resource intensive, and lightening some of the burden on lecturers whilst at the same time making the programme accessible to more students. The potential for these two technologies should be developed further in conjunction with technologies that facilitate the learning of practical skills, to provide a holistic PT training experience in a positive manner is vast.

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