



ORIGINAL RESEARCH ARTICLE

Creating an Interactive, Inter-Professional Space for Healthcare Training: An Utopian View

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ABSTRACT

Creating stimulating, future-focused learning environments is essential, considering learning as the interplay between students and their environment. Developing optimal learning spaces requires a holistic, transformative approach at both theoretical and practical levels. This study sought insights from relevant co-creators – i.e., students, academics, clinicians - to identify essential factors for designing an interactive, inter-professional space for healthcare training. This study utilised a Critical Utopian Action Research design. Purposefully selected co-creators participated in two Future Creation Workshops (FCWs) to provide keywords for utopian desires and anticipated challenges in the envisioned space during phases 1 and 2 respectively. Keywords, were subsequently thematically grouped and ranked. In phase 3, participants further contributed insights on initiating the prioritised utopian ideas. Fourteen consenting participants were equally distributed in two FCWs. The top three utopian priorities were *Human resources*, *Educational technology*, and *Physical space*. The top three challenges envisioned were *Digital resources*, *Human resources*, and *Organizational challenges*. *Innovative leadership*, *Funding*, *Access*, and *Empowerment* were proposed to guide the creation of the desired space. Incorporating diverse co-creators ensured a comprehensive grasp of needs, desires, and proposed actions for developing an interactive, inter-professional learning space. Even though the value of creating a digital learning space was evident, the impact of the current challenges within the global higher education environment, such as funding and digital access, cannot be ignored. Innovative leadership, to strategically and effectively utilise such an interactive space within the teaching and learning environment, would thus be the biggest driver of success.

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1. Introduction

Quality tertiary education, through technology integration, academic excellence and psychoactive readiness, is critical in achieving the set sustainable development goals and ensuring graduates can meet the needs of the knowledge economy (Aarup Jensen & Krogh, 2017). With the increased integration of technology and artificial intelligence not only within our daily lives but also in tertiary education and healthcare practice, new and additional skills are required from graduates. The importance of reimagining curricula to include the development of 21st-century skills is advised (van der Merwe & Janse van Vuuren, 2024; Pretorius & Nel, 2021; Mahdy, 2020; Page et al, 2019). These 21st-century skills may be related to professional and eco-conscious sustainability, adept engagement with technology, sensitive intercultural interactions, and global citizenship. Vast bodies of readily available information requiring processing, and the increasing speed at which knowledge and technology are produced, additionally necessitates the inclusion of attributes relating to the critical utility of technology for legitimate, beneficial, and empowering use. For graduates to be adequately prepared for practice, learning experiences where students can master these foundational attributes at the entry level should be integrated into the curriculum as early as possible to develop the competencies required before moving into clinical settings (Madhavanprabhakaran, 2015).

2. Literature Review

Not only does the development of essential profession-specific skills remain essential in tertiary education, but so also the need for a reconceptualisation of educational environments. Within the rapidly changing tertiary education milieu, university teaching has evolved with learning spaces moving beyond the mere brick and mortar of university estates (Higgs, 2022; Lamb et al., 2021). The term hybridity has been firmly established within the tertiary education space and speaks to the undeniable fact that digital technologies are inextricably woven into our educational fabric (Lamb et al, 2021). Digital technologies have not only become synonymous with tertiary education, shaping its educational spaces and practices (Lamb et al., 2021) but are also an integral part of healthcare provision through increased digitalisation of healthcare practices.

A substantial increase in access of both synchronous and asynchronous educational spaces via various devices has allowed students and educators to learn and interact with each other in a variety of formats even if they are geographically dispersed (Jeffries et al., 2022; Moonasamy & Naidoo, 2022). The integration of technology in education, including healthcare education, has also demonstrated positive outcomes in terms of increasing student engagement (Higgs, 2022; Pretorius & Nel, 2022; Green, 2022), allowing for inter-professional education and developing critical thinking and creativity to name a few. However, barriers to the integration of technology are also well reported specifically those relating to digital literacy, inequalities in terms of access to digital and physical resources, limited basic infrastructure such as continuous electricity and network availability, and assumptions that specific generations of students will undoubtedly have digital skills which are transferable to their educational environment and experience (Moonasamy & Naidoo, 2022; Shafiei Sarvestani et al., 2023; Green, 2022). Recent literature has alluded to the fact that although undergraduate students may be technologically active, they remain digital 'immigrants' (Chukwuere, 2017) and might not be as well versed in utilising the available technology within a teaching and learning environment (Aungst & Patel, 2020). Adding to the aforementioned limited digital literacy of students, the multidimensional concept of digital readiness also needs integration. Digital readiness, in comparison to digital literacy which only looks at skills and knowledge in utilising digital devices, does not only refer to the motivation and competence to effectively engage with digital equipment and

infrastructure but also requires a cultural shift and acceptance from both students and educators (Dickenson, Tebutt & Abdulhussein, 2022). The focus should therefore be on enabling and empowering all stakeholders in embracing and effectively utilising available technologies and understanding the pedagogical strategies to optimally integrate them within learning and teaching (Shafiei Sarvestani et al., 2023; Koç, 2005).

Although students share responsibility for managing and creating their own knowledge, tertiary education institutions should create stimulating learning environments for students (Marquez & Garcia, 2019). Learning is therefore not merely a confined, internal process, rather it is the result of the relationship between the student and their environment (Damsa, 2019), supporting the impact of carefully designed learning spaces in educational change (Damsa, 2019; Goodyear, 2022). Based on the Activity-Centred Analysis and Design (ACAD) framework, the authors consider both the human and non-human factors that influence emergent learning occurring within a mindfully designed learning ecosystem (Green, 2022). Four main structural elements form the ACAD framework as illustrated in Figure 1.

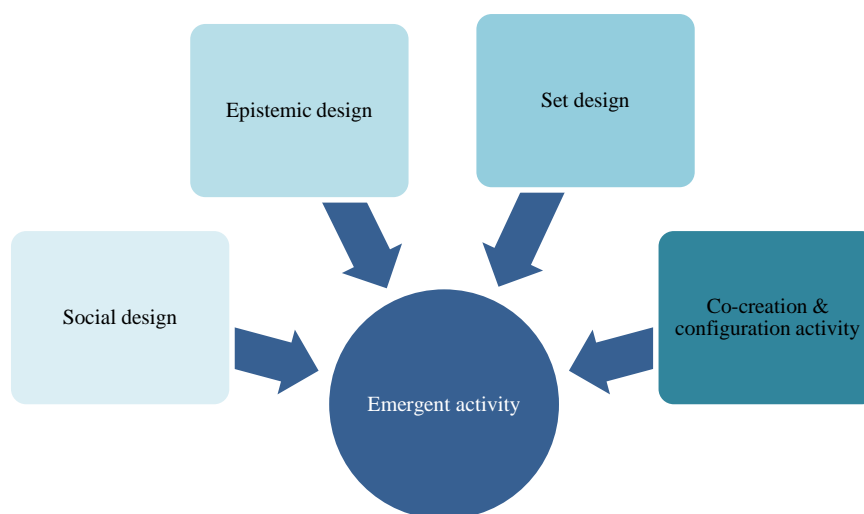


Figure 1. ACAD framework (adapted from Green, 2022)

As a learning ecosystem aligned with the ACAD framework, the authors consider the interplay and connections between the task design (epistemic design), design of the physical space and resource availability (set design), nature of the collaboration (social design) and the subsequent co-creation of knowledge emerging from the designed activity resulting in both individual and environmental transformation (Green, 2022; Damsa, 2019). As the focus of this study was the creation of the interactive, inter-professional space and not necessarily the design of individual learning tasks, the ACAD framework elements, under the control of the authors, related to the set and social design elements. However, when designing the space, it quickly became apparent that there should be a clear and intentional link with the epistemic design of learning tasks. A collaborative research process was selected as it is the vehicle for transforming our environment according to the desires of all involved stakeholders and not only a select few (Egmose et al., 2020). Subsequently, co-creation not only in the activities enacted within the interactive space but also in the physical development of the space was viewed as essential to ensure a shared vision. This study therefore aimed to identify what relevant co-creators view as essential to be included and considered in the creation and integration of an interactive, inter-professional space for healthcare training.

3. Method

A Critical Utopian Action Research (CUAR) design (Egmose et al., 2020) was utilised to map what the purposively sampled co-creators - students, academics, and professionals in the

clinical healthcare setting - legitimise as essential to be considered in the design of an interactive, inter-professional student learning space within a health sciences faculty. The CUAR design has the strength of being value-based through collaborative participation in shaping everyday life and offers the opportunity for collaboration and co-creation between participants through participation in the Future Creating Workshop (FCW) (Egmose et al., 2020).

Ethical approval was obtained by the Health Sciences Research Ethics Committee (UFS-HSD2022/1918/2803) of the University of the Free State (UFS) before the study commenced. An exploratory study, facilitated by a qualitative research expert, was performed to provide insight into the possible interpretation and understanding of the posed questions. Following the exploratory study, question sequencing was altered to start each FCW with the identification of utopian ideas and wishes rather than experienced and/or envisioned challenges (Figure 2). The reasoning was that research participants tend to focus more on the first questions asked, for example in a survey, therefore it is advised to position more important questions first (Jones et al., 2013). Secondly, it is hypothesised that co-creators should then be able to list and discuss their experienced and/or envisioned challenges in direct relation to these ideas more easily. An additional amendment was to aim to complete the full FCW (i.e., phases 1 through 3), in one session as co-creator schedules were a challenge which might have resulted in them not returning to complete phase 3 (as per the standard methodology of a CUAR approach).

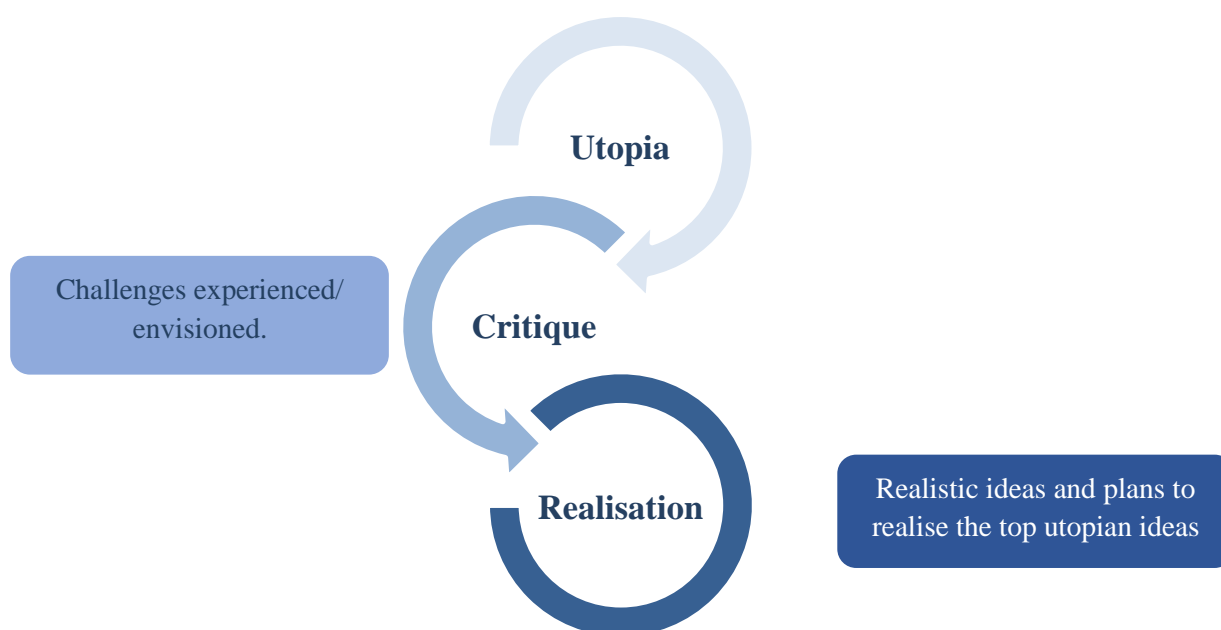


Figure 2. Future Creation Workshop phases following the exploratory study

An information leaflet detailing the project aim was distributed amongst purposefully selected second to fourth-year students, academics, and professionals in the clinical fields presented in the School of Health and Rehabilitation Sciences. These clinical fields include Exercise and Sport Science (Biokinetics), Nutrition and Dietetics, Occupational Therapy, Optometry, and Physiotherapy. Experts in the fields of digitalisation and/or blended teaching and learning were also purposefully sought to complement the research population. The researchers aimed to include a balanced ratio of co-creators (i.e., academics:students:professionals:digitalisation experts:blended learning experts) in each of the two FCWs consisting of approximately 10 co-creators.

Scheduling that would best suit consenting co-creators were identified and logistical arrangements were made for both of the FCWs. Co-creators could choose to join the FCW online via Microsoft Teams or in person. To allow synchronous participation by both in-person and virtual co-creators, an interactive screen was utilised to conduct the FCW. This

ensured that online co-creators were able to, in real-time, view and participate in the FCW. Both FCWs were audio-recorded. Co-creators were provided with participant numbers for ease of transcription. Only one author (AvM) had access to the audio recordings and did the transcription independently. Screenshots of the keywords and themes noted on the whiteboard, for data triangulation, also contained no personal identifiers.

In line with the CUAR methodology, FCWs were managed by an expert facilitator (Egmose et al., 2020) to facilitate equal opportunities for sharing, collective reflection, and finally consensus and prioritisation regarding the issues raised (Egmose et al., 2020). A guiding document was developed by the researcher to ensure that the three FCW phases were uniformly facilitated in each of the FCWs.

During phases 1 and 2 co-creators provide keywords related to the question asking them to identify utopian ideas on how to create the desired space (phase 1) as well describing experienced and/ or envisioned challenges related to the creation of the desired space (phase 2). Subsequently, each phase is concluded by co-creators thematically grouping and ranking the top three themes. In contrast to the Nominal Group Technique, FCWs not only identify ideas they deem important but also consider, during the third phase, how one might begin realising the top utopian ideas.

4. Findings

A total of 14 co-creators agreed to participate in the FCWs, with a mostly equal distribution of areas of specialization between the two groups (Table 1) which enabled balanced discussions.

Table 1. Co-creators included in each FCW

Area	FCW 1 (n=7)	FCW 2 (n=7)
Undergraduate student	1	1
Academic	2	3
IT specialist/ digitalisation specialist/ Manager of specialised unit	1	2
Learning designer	1	1
Clinician	2	0

Considering the increased integration of blended learning and/or digitalisation within tertiary education, many of the co-creators had experience in more than one area thereby enhancing the breadth of the information obtained during the FCWs.

Due to the structured nature of the FCWs, the facilitator could easily ensure that co-creators remained focused on the question at hand (Egmose et al., 2020). Additionally, repeated table rounds allowed equal sharing opportunities, minimising potential power imbalances (Søndergaard et al., 2018).

Results included in this section will first focus on the identified priority utopian ideas emerging from the two FCWs followed by the ranked challenges identified in the creation and integration of an interactive, inter-professional space for healthcare training. Subsequently, the themes relating to the implications for implementation will be presented and discussed in contrast to the identified ideals and challenges.

The first question posed to participants was focused on how they envision an interactive, inter-professional space in a setting where money and resources are not a consideration. Participants had time to consider the question and via round-robin, keywords were provided by all co-creators until there were no new additions. Keywords were reviewed and grouped under participant-identified themes. Six and five utopian themes, with clarifying keywords, were identified during FCW 1 and FCW 2 respectively. Participants individually voted on the importance of the identified utopian themes. When prioritisation voting was calculated, the top three utopian priorities were identical between the two groups supporting the importance of these aspects (Figure 3). Support for both students and staff within such a space was unequivocally viewed as the top priority by both groups. The themes of Digital

technology and Equipment (FCW1) were merged under the unifying theme of Educational technology as the provided keywords and supporting arguments were in line with that identified in FCW 2 and referred to technologies and equipment utilised within the educational space.

The same process, as described above, was followed where co-creators were requested to identify what worries them or problems they can think of when they imagine an interactive, inter-professional space that includes a technology-enhanced approach to learning in health sciences education. A total of four and five themes with supporting keywords were identified in FCW1 and FCW2 respectively. Following the prioritisation voting, the top three themes relating to challenges envisioned in such a space were again identical between the two FCWs namely Digital resources, Human resources, and Organisational challenges (Figure 3). The themes of Organisational challenges (FCW1) and Funding (FCW2) were merged under the unifying theme of Organisational challenges as the provided keywords and supporting arguments were in line with that identified in FCW2 and referred to institutional support, both physical and financial in developing and maintaining such a space. An important challenge highlighted by co-creators was the apparent lack of proficiency of educators in incorporating alternative technology-driven teaching and learning approaches, coupled with restricted student access to devices and a lack of digital literacy.

During phase 3 co-creators were required to consider the ideas that they have identified and prioritised on the interactive white board and propose key strategies for how they view this may be realised considering their context. A total of eight strategies were thematically grouped into four themes by participants, namely Empowerment, Access, Innovative leadership, and Funding to guide the realisation of creating an interprofessional, interactive space through consideration of both identified utopian priorities and envisioned challenges (Figure 3).

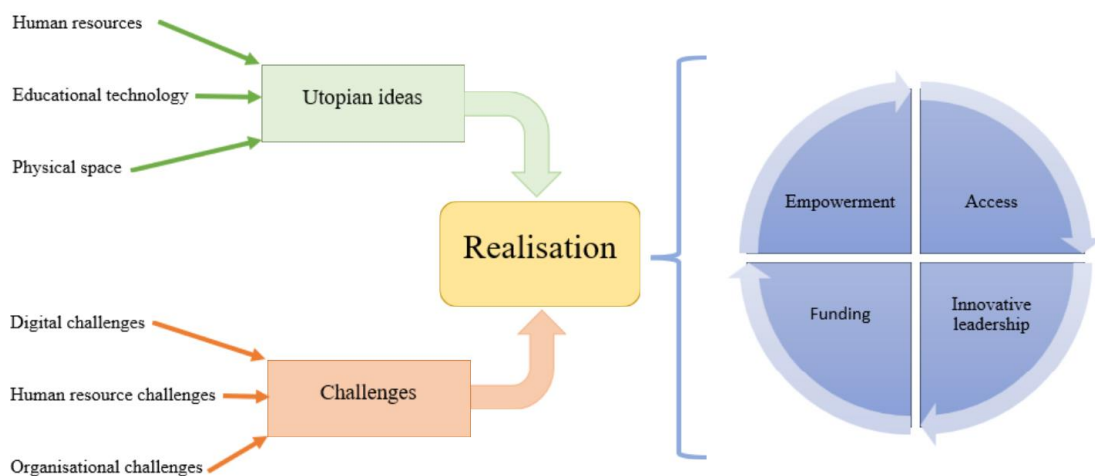


Figure 3. Prioritised themes for all FCW phases

5. Discussion

Creating an interprofessional and interactive space “where students can learn with, from and about each other”, with management allowing “equal opportunity for education in the space” highlights the importance of empowering all stakeholders who utilise and engage with the space, the need for innovative leadership, appropriate resource management and space adjustability to accommodate a variety of needs.

The creation of a mindfully and collaboratively designed interactive, interprofessional learning space should be founded on empowerment. Empowerment in this context refers to the upskilling of both students and staff to utilise the created space and provided technologies, as well as ensuring access and knowledge about available institutional resources in assisting their development (Figure 3). Prioritising the focus on “empowering the human resources”

[FCW1, P5] should aim to improve the competency of educators in not only the use of new technologies but also on how to effectively integrate new ways of doing and knowing into their teaching and learning (Shafiei Sarvestani et al., 2023; Koç, 2005), especially when aiming to enhance student capabilities for the world of work (Hanks et al., 2021). Many healthcare educators remain novices when it comes to leveraging the power of educational technology in their teaching and learning and are still lacking the motivation and confidence to engage in this cultural shift (Dickenson, Tebutt & Abdulhussein, 2022). Even after the impact of the COVID-19 pandemic on the education environment, educators remain uncertain and struggle with optimally integrating an interactive approach to their learning activities where students learn with technology and/or outside of the traditional classroom environment (De Vera et al., 2021). It is therefore no surprise that a human resource challenge (Figure 3) and subsequent need identified by co-creators was a lack of competency on the part of educators in effectively harnessing technology and interactive teaching and learning design. Tertiary education has undergone some significant changes and with the emergence of, amongst various others, artificial intelligence, these changes remain ongoing at a pace that cannot be easily matched. Teaching practices, especially in hybrid learning environments, require discipline expertise in combination with careful design, pedagogical strategies, facilitation techniques, technology skills, and platform management expertise (Shafiei Sarvestani et al., 2023; Koç, 2005). Not only is ensuring constructive alignment in educational methodologies essential but as highlighted by a co-creator, “getting them [students] ready for what's going to find in the workplace....but also technologies, emerging technology” [FCW2, P4]. Therefore, staff development is advised to focus on developing skills related to constructively aligning technology-enhanced interactive learning activities with both real-world expectations and the overarching learning outcomes (De Vera et al., 2021; Hanks et al., 2021; Koç, 2005).

Parallel to educator support and empowerment, the empowerment of students was also noted as essential in creating a sustainable learning space. Co-creators noted the need for mentors and/or facilitators to guide students in optimally engaging in the curated learning activities, in addition to the cited challenge of the lack of orientation regarding the expectations of educators from students. It should be noted that despite their familiarity with technology students may not possess effective strategies for leveraging technology in meaningful ways for their learning and can vary significantly based on several factors, including their prior exposure to technology, their field of study, and their motivation and interest (Tudor Car et al., 2022). Current research indicates a potential lack of proficiency on the part of students in effectively utilising available technology for educational purposes (Aungst & Patel, 2020; Chukwuere, 2017), with Kennedy & Yaldren (2017) strongly advocating for the need for upskilling the healthcare workforce in terms of digital literacy to improve healthcare. Similarly, a study conducted in South Africa exploring the digital learning landscape of undergraduate students indicated that students remained challenged within the online space, with the integration of strategies to address digital literacy recommended (Moonasamy & Naidoo, 2022).

Compounding the challenge faced in terms of limited digital literacy, access to resources remains an increasing concern for institutions and educators in the digital age (Moonasamy & Naidoo, 2022). The theme of Access in the context of this article refers to both physical access to both equipment and the space as well as facilitating access to other essential human and readily available institutional resources which may assist in the optimal fit-for-purpose utilisation of the space (Figure 3). With the massification of tertiary education, and the increased use of digital software and hardware in both healthcare education and practice, digital literacy remains a concern and if not addressed the digital divide will continue to expand (Dickenson, Tebutt & Abdulhussein, 2022; Aungst & Patel, 2020). Before, but more so following the COVID-19 pandemic, the use of video conferencing to facilitate interactive real-time discussions, presentations, and tutorials became a norm in the majority of

healthcare training programmes (Jeffries et al., 2022). Face-to-face engagements continue to be supplemented with video demonstrations, the provision of pre-recorded demonstrations, and a variety of virtual reality simulations (Higgs, 2022; Jeffries et al., 2022) with the acknowledgment that engaging in such technology-enhanced activities paves the way for students to seamlessly enter a rapidly changing healthcare setting. Although healthcare digitalisation was not widely adopted before the COVID-19 pandemic, the integration of technology into the provision of healthcare is now undeniable (Jeffries et al., 2022). Engaging with health-related aspects such as remote monitoring, telehealth and other digital applications during their undergraduate training is thus essential and aims to ensure graduates seamlessly adapt to the clinical environments where these skills are expected (Jeffries et al., 2022).

Considering the importance of technology-enhanced education, one must address inequalities in terms of access to digital and physical technology-based resources which may create barriers and negatively impact students' educational experiences (Moonasamy & Naidoo, 2022; Tudor Car et al., 2022). Limited access to digital resources can exacerbate existing digital literacy gaps among students therefore co-creators believed the created interactive space should be "both accessible to the lecturers so that visitors can use it, but maybe also that it's accessible to students if they want to go and practice on their own." [FCW2, P4]. Students need to have the necessary "support to be able to use the tech or the techniques or whatever it is they're going to learn." [FCW2, P4]. Educators are therefore advised to scaffold and provide clear instructions on how to navigate the platform required for the teaching and learning activity to ensure student familiarity and comfort with the platforms. Additionally, the power of peer learning may also be used to allow students to help each other (Barkley, 2010) in navigating the digital space thereby aiming to narrow the digital divide.

Access to resources to assist educators to "take my [their] idea and make it a reality" [FCW1, P2] was also noted by co-creators as an essential consideration in the creation of the desired space. Especially following the COVID-19 pandemic where tertiary education was thrust into the online age, institutions, in even less developed countries, have made major strides in incorporating technology through the utilisation of online learning management systems, video conferencing tools, and other digital platforms for teaching and learning (Moonasamy & Naidoo, 2022). Globally most institutions have onsite technological support for staff in developing teaching and learning activities and managing educational technologies (Jeffries et al., 2022; Tømte et al., 2019). Consideration of the aforementioned services, including freely accessible open-access resources, could go a long way in alleviating the burden on individual educators in creating content. Learning experience designers [FCW1,P2], audio-visual specialists [FCW1,P1], and other appropriate departments are invaluable resources that could assist educators in creating contextualised content in various formats to enhance their teaching and learning.

As we learn to navigate our new normal of hybridity, the basic human need of being part of a community remains. Student engagement is said to be enhanced when students feel part of a community, notably in learning with and from each other (Barkley, 2010), therefore supporting the inclusion of an interactive learning space. But, as eloquently noted by Marquez & Garcia (2019), institutions and educators have the responsibility of creating learning environments that stimulate students and facilitate their engagement in the learning activity. It is thus imperative that educators look beyond their activities, but also consider the environment created for the students. Ensuring an accessible space, where thought has been put into "different abilities, all the differences that we have to make that space inclusive" [FCW2, P4] could go a long way in breaking down the well-reported silos within faculties. Therefore, it should be an "adjustable space" [FCW1, P2] to allow for an inclusive and collaborative space where students could work either alone or in a variety of group sizes, depending on the requirements of their specific learning activities. Pretorius & Nel (2022)

strongly advocated for the increased use of collaborative learning in tertiary education as it is a lifelong learning skill that significantly contributes to the development of negotiation, interpersonal skills, critical thinking, and problem-solving skills. Although the value of collaborative learning has been well cited, there will be instances where students will have to adjust the learning space to accommodate individual work and task engagement, further necessitating an adjustable space.

Access to sustenance was also cited as a priority when designing the physical space.

Considering our human need for community, an informal area where students can engage around a cup of coffee was advised by the FCW participants.

Funding and Innovative leadership were the remaining emerging themes aiming to facilitate the realisation of creating the desired space (Figure 3). Innovative leadership was proposed by the co-creators as essential in spearheading the project as well as continually investigating aspects related to the use and sustainability of the space. Therefore, the two themes related to funding and leadership will be discussed together as they are inextricably linked and dependent on each other.

Financial constraints in tertiary education have been well reported and future-focussed management of a learning space is therefore imperative in ensuring the sustainability and success thereof. As mentioned by one co-creator, “Some really innovative thinking...creativity.” [FCW2, P1] is essential when leading the creation and maintenance of the created space. Not only in creating a shared vision but to “...get everyone's buy-in into the vision first” [FCW2, P4] before embarking on the project is paramount in ensuring success. Contrasting the high speed at which technology and knowledge are generated with the timeous institutional procurement processes, one should be mindful when selecting educational technology. As noted by one co-creator “You've got all the equipment, you've got everything. But to manage everything, sometimes the process is slow” [FCW1, P2]. A prioritised challenge identified by co-creators, namely organisational challenges, speaks directly to challenges related to procuring equipment, ensuring the availability of information technology support as well as available institutional funding for general maintenance.

It is only human to gravitate to the newest technology and programmes, but considering sustainability within the financially strapped tertiary education milieu, it is advised that educators rather leverage institutionally available programmes to assist students in their learning (Jeffries et al., 2022). Additionally, co-creators were of the opinion that it should be remembered that educational technology should remain fit for purpose as educators aim for “getting them [students] ready for what [they] can find in the workplace” [FCW2, P3]. Within health sciences, for example, the authors propose that the need for specialised video editing software might be mitigated as students might only require equipment for basic video editing when participating in certain learning activities. Utilising readily available resources should relieve some of the financial burdens of maintaining the learning space (Green, 2022; Jeffries et al., 2022). It should also be considered that the learning space created in this study is learning-centered and therefore caters more to what students might need to optimise their learning within an interactive space through engagement with both educational and healthcare-related digital technologies. Educator needs and support may not be entirely situated within the created space, but rather be addressed through staff development interventions and collaborations.

Increasing the visibility of the space and the activities hosted within it, is an ideal way of expanding the reach of the curricula. Considering the call for internationalisation and increased collaborations between geographically dispersed partners, co-creators indicated that “...if it's [learning space] run well to use it for research. And I think that would also assist in kind of supporting the running of the facility” [FCW1, P2]. Additionally, diversifying partnerships and collaborations “which would link us with first world countries, with first

world ideas, with futuristic knowledge” [FCW1, P6] would go a long way in truly creating knowledge co-construction opportunities for both educators and students participating.

6. Conclusion

The use of the CUAR methodology sought not only to understand and critique existing social structures and systems for interprofessional, interactive teaching and learning, but also to actively engage in transformative actions to bring about positive change in the format of a desired learning space. Including various co-creators ensured a holistic understanding of the needs, desires and proposed actions to create such a space promoting a nuanced approach. However, the study included co-creators from only one faculty within a single institution, and the results may therefore not be generalisable to the greater healthcare education community. The absence of a clinician in the second FCW also posed a challenge to the clinical contextual inputs for that session. Notwithstanding, the challenges related to funding constraints and ensuring equal access for all students are universally shared, making the findings and recommendations applicable across diverse educational settings.

The results of the study provided valuable insight into the aspects viewed as essential by a diverse group of co-creators when designing an interactive, inter-professional space for healthcare students. The value of digital learning spaces was supported by participants; however, the initiatives to ensure the success of such a space are inevitably intertwined with the current challenges within the global higher education environment, such as funding, access and the need for continuous empowerment of students and staff to deal with the constant change. Innovative leadership, to strategically and effectively position such a space within health sciences education, would be the biggest driver of success.

Once such an interprofessional, interactive space is created, the authors suggest future research to investigate student experiences related to engaging with and in the created space and, subsequently, the perceived impact thereof on their learning experience.

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Declaration of Competing Interest

The authors declare that they have no competing financial interests or known personal relationships that would influence the report presented in this article.

References

- Aarup Jensen, A., & Krogh, L. (2017). Re-Thinking Curriculum for 21st-Century Learners: Examining the Advantages and Disadvantages of Adding Co-Creative Aspects to Problem-Based Learning. In T. Chmi & L. Krogh (Eds), *Co-Creation in Higher Education: Students and Educators Preparing Creatively and Collaboratively to the Challenge of the Future* (pp. 1-14). Rotterdam: Sense Publishers.
- Aungst, T.D., & Patel, R. (2020). Integrating digital health into the curriculum- Considerations on the current landscape and future developments. *Journal of Medical Education and Curricular Development*, 7,1-7. <https://doi.org/10.1177/2382120519901275>.
- Barkley, E.F. (2010). Student engagement techniques: A handbook for college faculty. Jossey-Bass: San Fransisco. p.278.
- Chukwuere, J.E. (2017). From decolonisation to digitalisation for education in South Africa. *International Journal of Scientific research*, 73(12/1), 232-241. <https://doi.org/10.21506/j.ponte.2017.12.15>.

- Damşa, C., Nerland, M.N., & Andreadakis, Z.E. (2019). An ecological perspective on learner-constructed learning spaces. *British Journal of Educational Technology*, 50(5),2075-2089. <https://doi.org/10.1111/bjet.12855>.
- De Vera, J.L., Andrada, M.D., Bello, A.Q., & De Vera, M, D. (2021). Teachers' competencies in educational technology integration on instructional methodologies in the new normal. *LUKAD: An online journal of pedagogy*, 1(1),61-80.
- Dickenson, A., Tebbut, J., & Abdulhussein, H. (2022). An overview of digital readiness in dentistry- are we ready? *British Dental Journal*, 233(2),87-88. <https://doi.org/10.1038/s41415-022-4449-6>.
- Egmose, J., Gleerup, J., & Nielsen, B.S. (2020). Critical Utopian Action Research: Inspiration for democratization. *International review of qualitative research*, 13(2),233-246. <https://doi.org/10.1177/1940844720933236>.
- Goodyear, P. (2022). Realising the good university: Social innovation, care, design justice and educational infrastructure. *Postdigital Science and Education*, 4:33-56. <https://doi.org/10.1007/s42438-021-00253-5>.
- Green, J.K. (2022). Designing hybrid spaces for learning in higher education health contexts. *Postdigital Science and Education*, 4,93-115. <https://doi.org/10.1007/s42438-021-00268-y>.
- Hanks, S., Neve, H., & Gale, T. (2021). Preparing health profession students for practice in complex real world settings: How do educators repond to a model of capability? *International Journal of Practice-based Learning in Health and Social Care*, 9(1),50-63. <https://doi.org/10.18552/ijpblhsc.v9i1.749>.
- Higgs, L. (2022). Curriculum planning of virtual learning based on the Acker model. *The International Journal of Learning Spaces Studies*, 1(1),43-49. <https://doi.org/10.22034/lss.2022.175747>
- Jeffries, P.R., Bushardt, R.L., DuBose-Morris, R., Hood, C., Kardong-Edgren, S., Pintz, C., Posey, L., & Sikka, N. (2022). The role of technology in health professions education during the COVID-19 pandemic. *Academic Medicine*, 97(3). <https://doi.org/S104-S109.10.1097/ACM.0000000000004523>.
- Jones, T.L., Baxter, M.A.J., & Khanduja, V. (2013). A quick guide to survey research. *The Annals of the Royal College of Surgeons of England*, 95,5-7. <https://doi.org/10.1308/003588413X13511609956372>.
- Kennedey, S., & Yaldren, J. (2017). A look at digital literacy in health and social care. *British Journal of Cardiac Nursing*, 12(9),428-432. <https://doi.org/10.12968/bjca.2017.12.9.428>.
- Lamb, J., Carvalho, L., Gallagher, M., & Know, J. (2022). The postdigital learning spaces of higher education. *Postdigital Science and Education*, 4,1-12. <https://doi.org/10.1007/s42438-021-00279-9>.
- Koç, M. (2005). Implications for learning theories for effective technology integration and pre-service teacher training: A critical literature review. *Journal of Turkish Science Education*, 2(1),2-18. <https://www.tused.org/index.php/tused/article/view/51>
- Madhavanprabhakaran, G., Al-Khasawneh, E., & Wittmann, L. (2015). Perceived benefits of preclinical simulation-based training on clinical learning outcomes among Omani undergraduate nursing students. *Sultan Qaboos University Medical Journal*, 15,1,e105-e111.
- Mahdy, Z.A., Maaya, M., Atan, I.K., Samat, A.Z.A., Isa, M.H., & Saibon, I.M. (2020). Simulation in healthcare in the realm of Education 4.0. *Sains Malaysiana*, 49(8),1987-1993. <https://doi.org/10.17576/jsm-2020-4908-21>.
- Marquez, E., & Garcia, S., Jr. (2019, June). Creating a Learning Environment that Engages Engineering Students in the Classroom via Communication Strategies Paper presented at 2019 ASEE Annual Conference & Exposition, Tampa, Florida. <https://doi.org/10.18260/1-2--32556>.

- Moonsamy, A.R., & Naidoo, G.M. (2022). Digital learning: Challenges experienced by South African university students' during the COIVD-19 pandemic. *The Independent Journal of Learning*, 17(2),76-90.
- Page, S., Trudgett, M., & Bodkin-Andrews, G. (2019). Creating a degree-focused pedagogical framework to guide indigenous GA curriculum development. *Higher Education*, 78,1-15. <https://doi.org/10.1007/s10734-018-0324-4>.
- Pretorius, E., & Nel, H. 2021. Collaborative learning experiences of fourth-year students in a social work module. *SOTL in the South*, 5(2),52-68.
- Shafiei Sarvestani, M, Arab-Moghaddam, N., Mirghafari, F., Khadem, K., & Azarpeykan, B. (2023). Academic Staff Opinions on Issues Related to Investment in E-learning: A Qualitative Multi-Method Approach. *The International Journal of Learning Spaces Studies*, 2(1), 1-14.
- Søndergaard, E., Ertman, R.K., Reventlow, S., & Lykke, K. (2018). Using a modified nominal group technique to develop general practice. *BMC Family Practice*, 19,117. <https://doi.org/10.1186/s12875-018-0811-9>.
- Tudor Car, L., Poon, S., Kyaw, B.M., Cook, D.A., Ward, V., Atun, R., Majeed, A., Johnston, J., van der Kleij, R.M.J.J., Molokhia, M., Wangenheim, F.V., Lupton, M., Chavannes, N., Ajuebor, O., Prober, C.G., & Car, J. *Journal of Medical Internet Research*, 24(3),e31977. <https://doi.org/10.2196/31977>.
- Tømte, C.E., Fosslund, T., Aamodt, P.O., & Degn, L. (2019). Digitalisation in higher education: mapping institutional approaches for teaching and learning, *Quality in Higher Education*, 25(1), 98-114. <https://doi.org/10.1080/13538322.2019.1603611>.
- Van der Merwe, A. & Janse van Vuuren, C. (2024). Creating transformational learning experiences for 21st century healthcare students through preclinical skills training at a South African university. *BMC Medical Education*, 24,198. <https://doi.org/10.1186/s12909-024-05177-9>.