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DOI: https://doi.org/10.38140/pie.v41i2.6863

e-ISSN 2519-593X

Perspectives in Education

2023 41(2): 195-210

PUBLISHED:
30 June 2023

RECEIVED:
28 October 2023

ACCEPTED:
12 June 2023

Published by the UFS
http://journals.ufs.ac.za/index.php/pie

A case for deliberate and accommodative design for blended teaching and learning in universities in developing countries

Abstract

Since the emergence and development of digital technologies, the internet has quickly emerged as one of the most effective platforms for providing teachers and learners with access to resources for learning and sharing material. Universities in developing countries have limited access to digital technologies. At the few universities with access to digital technologies, there is arguably a lack of inclusive and accommodative pedagogy. Furthermore, challenges range from accessibility, administration, governance, and general lack of resources to inclusive module design due to inequalities. After the emergence of digital technologies, universities have had the benefit of curating some of their offerings to an 'E-Learning' mode, where learners and lecturers interact digitally. The technology part of the 'blend' is crucial, as it allows teachers and learners to interact beyond the classroom, form online communities of sharing ideas and debates, and learn according to their pace and environment. However, developing countries seem to be battling the challenge of transitioning from past teaching and learning policies, innovation, and education strategies. Furthermore, there have been several reasonable criticisms of the use of technology in education; some are concerned with the curriculum, knowledge, and pedagogy. Thus, this article caters for some criticisms using the theoretical framework research methodology. This article advocates blended learning and Universal Design for Learning (UDL) integration at universities in developing countries by relying on national and international studies. The UDL principles that this article advocates to be included in module and course design are multiple means of engagement, multiple means of representation, and multiple means of action and expression. Universities in developing countries experience unique challenges ranging from administrative, teaching and learning, and adaptation challenges due to a lack of resources and untrained academics and learners having to navigate the online learning environment.

Keywords: *epistemic structure, generics, regions, singulars, Technological Pedagogical Content Knowledge (TPACK), Universal Design for Learning (UDL)*

1. Introduction

Porter *et al.* (2014) state that higher education institutions should first define what blended learning means for them to arrive at the point where the adoption and implementation phases begin. The implications of the technology part of blended learning appear synonymous with integrating technology in schools. It would, therefore, be beneficial to explain what technology is. Technology is any aid that is designed and used for practical purposes through the application of systems. This article introduces blended learning involving pedagogy, the web, and instructional technology. To form an argument in the article, two conceptual frameworks are used, namely Pedagogical Content Knowledge (PCK) by Shulman (1987) and Technological Pedagogical Content Knowledge (TPACK) by Mishra and Koehler (2006), to emphasize that technology does not replace incompetent teaching, but serves as an aid to teaching and learning. The TPACK framework draws inspiration from the PCK framework by recognising the role of content and pedagogy as critical competencies of a teacher by integrating technology. Next, the rise and rejection of technology in developing countries are contextualised. At least at the basic education level, the "Gauteng Online" project launched in 2002 by the Gauteng provincial government was ultimately unsuccessful. The Gauteng Online project was a project that involved high schools in Gauteng, where the provincial government provided resources such as laptops, desktop computers, and tablets to the schools in the province. Although the project intended to digitise education and prepare learners for higher education, it failed due to a lack of teacher and learner training, stolen equipment, and teachers' reluctance to adapt to changes (Wilson, 2013). Such failures can be seen even in higher education (Ng'ambi *et al*., 2016)

Like most terms and theories, blended earning is a contested term. This article looks at adopting the definition of blended learning by Driscoll (2002), where blended learning is a focused mode of delivery, intended to afford learners and teachers to form communities of practices and engage better with the content of a module through the use of educational technology while addressing the learning needs of learners. Driscoll (2002) argues that acts of blended learning mean combining live virtual classrooms, including videos and audio uploaded on a virtual platform, while considering various pedagogical approaches such as constructivism, behaviourism, and cognitivism.

2. The international and local context of blended learning and UDL

The definitions of blended learning stated in the introduction are crucial, because they form an essential base for any institution (higher education or basic education) to start thinking about blended learning as an approach to teaching and learning. Bernstein (1999) categorises education institutions as *singulars*, implying the critical role of knowledge production and differentiation that education institutions should play. Young (2013) expands on the concept of *singulars, regions, and generics* by emphasising that universities and colleges should not drift away from this responsibility of knowledge production. He further provides arguments that support the importance of the community of scholars. It is, therefore, imperative for institutions of higher learning as *singulars* to distinguish themselves from *regions* (singulars conceptualised such as medicine and engineering) where the purpose is to be an interface between singulars and the external market (Rata, 2011).

Furthermore, education institutions should distinguish themselves from *generics* (formed and distributed outside and independent of the formal pedagogic curriculum), such as the corporate world and *edupreneuers,* i.e. individuals and companies that offer education management services (Lacatus &Staiculescu, 2016). The above categorisation of universities as singulars implies that universities should base their blended learning approach on academic theory, experiences of both learners and academics, and appropriate contextual analysis of situational factors (Dee Fink, 2003). Furthermore, a blended approach should be decided in relation to each institution's unique community, ensuring that the blended approach does not exclude others due to issues of access and training.

The recently updated principles and guidelines of Universal Design for Learning (UDL) by the Centre for Applied Special Technology (CAST) (2020) suggest important considerations of a course/module design for equitable use, access, and quality assurance in learning and teaching. A blended learning course/module design that is universally designed, among other things, to increase student engagement transcends the technological affordances and caters for different learning needs. In support of implementing blended learning at universities, the UDL principles for course design are essential components of blended learning. Furthermore, to address the recent concern mentioned by academics and learners (Chiu, Sun & Ismailov, 2022) – a concern about the lack of student engagement (Strydom & Loots, 2022) during the 'emergency' response, where institutions of higher learning immediately had to transition from offline to online learning modalities – it is important to give full consideration to situational factors. Barkley (2010) defines student engagement as time and effort from the learners' side and resources and research-based teaching from the institution's side. A justifiable approach to the exploration, adoption, and implementation must be adequately explored and researched to ensure accessibility, engagement, inclusivity, and other factors affecting each institution. This is what this article intends to report on using the guidance of the methodology on knowledge and knowledge production and accommodative design.

3. Methodology

This article interconnectedly uses the PCK, TPACK, and UDL frameworks in a blended learning course/module design. The PCK provides a basis for the importance of pedagogy, competence, and subject knowledge by the teacher. The TPACK framework draws from the PCK a significant fact that pedagogy is still an important skill expected from the teacher, even in the information age and era of digital technologies. The UDL instructional model provides an approach built on inclusivity and accessibility while connecting PCK and TPACK in recognising classroom learning needs. All three frameworks, when understood, have the potential to provide an accessible and engaging blended learning module. Moreover, in an attempt to address a few sociological concerns concerning the use of technology in student learning, this article relies on the most prominent education sociologists, such as Michael Young and Basil Bernstein (a concern that the modern-day curriculum blurs the distinction between curriculum and pedagogy). Secondly, I also refer to See *et al.* (2021), who argue that there is no link between technology and the enhancement of student learning.

This article aims to advocate a blended learning approach focused on positive learning outcomes, increases student engagement, is grounded on core-curricular knowledge and concepts, and is inclusive and just in practice while improving the accessibility of the content. In expanding the argument for a blended learning approach that includes PCK, TPACK, and UDL, articles and two books were reviewed by using keywords such as "blended learning",

"blended learning versus hybrid learning", "blended learning in developing countries", "technology for teaching", "knowledge production in the 21st-century", "curriculum crisis", and "Universal Design for Learning". The reviewed articles are from different databases, including SciELO, EBSCO, JSTOR, Google Scholar, and Scopus. The scope was then narrowed by excluding articles of the same arguments but by different authors and articles on corporate education.

4. Important sociological critiques and a brief address

See *et al.* (2020) argue that the use of technology in the classroom does not necessarily result in better learning outcomes for learners. This article deliberately uses the term 'learners' instead of 'students', and 'teacher' instead of 'lecturers' to emphasise learning. See *et al*. (2020) further argue that there is no evidence that learners learn better when using technology than when taught in offline modes/traditional teaching methods. With the rapid changes brought about by technology, curriculum specialists have raised concerns related to epistemology/pedagogy, overpopulated curricula, and the blurring of the distinction between curriculum and pedagogy (Bernstein, 1999; Young, 2011, 2013; Moore *et al.*, 2006). The concern was that the rise in the use of technology for teaching and learning had an epistemologically incorrect basis and approach to knowledge production, knowledge constitution, and differentiation in academic disciplines. This concern also argued that there has to be a clear distinction between knowledge and pedagogy. The epistemic knowledge structure (the relationship between concepts) was almost unconsidered (Young, 2013) in integrating technology into teaching and learning, and there was no knowledge differentiation. As Bernstein (1999) and Durkheim (1976) argue, knowledge differentiation is distinct characteristics that differentiate between everyday/common sense knowledge and scientific knowledge (usually gained through institutions of learning) and sacred vs. profane knowledge.

The second concern that is particularly important to consider for blended learning and designing a disruption-proof learning environment is the loss of the curriculum object (what learners are entitled to) (Young, 2013) and curriculum irrelevance (Gravett, 2019) due to the assumption that we ought to teach according to the changes brought by technology. The central argument in this concern is that the use of technology may result in neglecting the core-curricula knowledge, riding on the bandwagon of technology, and seeing technology as a means in itself instead of a means to an end (knowledge acquisition through deep learning). Scholars such as Young (2013) argue that we should not forget the primary existence of educational institutions. The existence of education institutions/schools and the curricula thereof is not to serve as a policy to address the failures of governments. Therefore, the supposed solution and innovation brought about by the use of technology in education should not serve to replace the primary existence of schools. Schools exist for and by knowledge (Gravett, 2019; Young, 2011).

5. An address of the sociological concerns

The response to both concerns should be broad in a manner that will do justice to the concerns and pave a possible way forward ,because technology and its rapid changes will happen anyway. The first concern could be addressed by setting a disclaimer that the use of technology in blended teaching and learning does not replace disciplinary knowledge or the structure of knowledge. The blended learning approach realises that disciplines and epistemic structure are central to developing learners' intellectual commodities/faculties, are derived

from a community of scholars and knowledge specialists, and are essential in transitioning learners from surface to deep learning (Bernstein, 1999). Therefore, the content in the curriculum stays as it is unless new scientific knowledge is produced which disapproves or expands a particular theory. In blended learning, knowledge and experience are explicitly set apart; experience is used as a pedagogic resource of the teacher (Young, 2011). Pedagogy, in this instance, means that it is the duty of the teacher to draw on the learners' experiences and relate those experiences to the content, if possible. Experiences are not the content of the curriculum. Therefore, knowledge differentiation and the curriculum/pedagogy distinction are illuminated. Here, frameworks such as the TPACK may guide teachers to focus on teaching and learning while technology becomes ubiquitous. At the same time, the PCK serves as a guide to ensure that teachers do not get on the bandwagon of technology as a replacement for bad teaching.

In an attempt to address the second concern above, it is imperative to deal with the issues of technology as a pedagogy rather than as content of the curriculum. The technology part of blended learning does not imply that the rapid technological changes give teaching and learning direction. On the contrary, the technology part of blended learning means that technology is used as a means to an end (knowledge acquisition), as alluded to above. Therefore, "the use of ICT in pedagogy will assist academics in the teaching and learning process while also improving their degree of professionalism" (Aminatun, 2019: 1). Furthermore, ICT tools, guided by the TPACK framework, must be exploited to work in favour of teachers and learners and to create a blended learning and teaching environment, as well as can cater for *all* learners should there be unforeseen disruptions such as a pandemic.

6. What do we already know about the use of technology in education?

Although scholars and educators need to be aware of these sociological critiques, it is vital to consider the impact of the appropriate use of technology in blended learning environments at universities, especially in the attempt to design 'disruption-proof' learning and teaching environments. Recently, Mafenya (2022) conducted a study and found that the COVID-19 pandemic has presented emerging nations like South Africa with several difficulties, including a lack of internet connectivity, students and teachers' access to technological platforms, experience with online teaching and learning methodologies, and technology acceptance. The shift of students to online learning in less-developed nations is hampered by reliance on technology and a lack of consistent internet connectivity. While these findings are important for this article, it would be more helpful to briefly discuss what we already know about the 'abilities' of technology in learning and teaching in South Africa and other developing countries. To achieve this, one will have to draw from existing theoretical frameworks and evidence of the success, limitations, and possibilities of the use of technology. Technology makes learning personal, self-paced, flexible, and effortless to some degree (Florin, Radu & Croitoru, 2011). As Muhuro and Kang'ethe (2021: 1) argue,

> the ideals of the fourth industrial revolution are that individuals have the capacity to think outside the box to find solutions to existing world problems using technological tools to support exploration, decision making and creation of products in the different fields.

Such ideals are important to consider, especially if our graduates are to compete globally in the place of work and research.

Learners often retain more material, because technology increases their desire to be engaged. Technology also provides experiential learning opportunities (such as making concepts tangible, creating communities of practice, etc.) that can be incorporated into all academic topics, such as mathematics, reading, science, and social studies. Moreover, "utilising technology in teaching and learning is powerful and provides education options such as replicating the classroom practice or including guest speakers worldwide" (Maree & Vos, 2021: 4). Because technology is an aid, it should be selected only if it has the potential to increase student engagement, create meaningful experiences, or allow learners to be creative and innovative in their approach to learning and assessment. This also emphasises that teaching using technology is not a substitute for an incompetent teacher who lacks Pedagogical Content Knowledge (PCK). Technology expounds on the teacher's abilities, meaning that technology is merely an extension of one's ability to teach and engage learners in the classroom (Ramorola, 2013).

The influence of technology on every sphere of human existence is too immense, to the extent that it becomes impossible to avoid it. Aminatun (2019) explicitly states the 'abilities' of technology in relation to traditional modes of teaching and learning. Technology development helps many areas of education, including teaching, learning, and research. For example, technology digitises information, which makes it easier for accessibility and alternative representation. Numerous content resources made available by technology support self-directed learning for both teachers and learners (Aminatum, 2019). This suggests that technology has substantial advantages if it is selected and appropriately used and has the prospect of driving innovation (because of the affordances), expedite, enhance, and strengthen abilities, help to engage learners, better integrate school experiences to cooperate procedures, generate a financial potential for future employees, and to solidify instruction and help educational institutions transform (Davis & Tearle, 1999; Lemke & Coughlin, 1998). It is evident how technology can enhance learning and teaching positively if the information and communication technologies are used appropriately.

7. More on the role of technology in blended learning

The use of technology to enhance knowledge production, *differentiation,* and epistemic structure is one of the most palatable benefits of ICT. These benefits are made possible through the appropriate use of technology, considering that technology is a tool that needs to be selected. The recognition of the relationship between disciplines, concepts, ideas, people, and ideologies is vital in student learning, knowledge production, integration, and interdisciplinarity of knowledge. Weller (2021) argues that interdisciplinarity makes it easier to find a theme that crosses disciplinary boundaries in literature, art, and history or science and mathematics. Studying topics thematically is one way to bring ideas together, resulting in more meaningful learning. This can occur by allowing learners to choose their subjects, and their learning is deepened when they reflect on the connections between what they are learning in different disciplines. All this can be advanced through the appropriate use of technology featured in blended learning.

Bandura's (1986) Social Learning Theory (SLT) analyses how learners learn and transition from common and everyday knowledge to scientific discourse/deep learning. According to Bernstein (1999), there are two discourses (with different forms of knowledge) whose differences are important to identify and clearly distinguish to do justice to the epistemic structure of knowledge. One is called horizontal discourse, where the form of knowledge is 'common' and everyday knowledge to which learners already have exposure, the

knowledge that learners use to form relationships amongst one another, and knowledge that is multilayered, local, and context-dependent. This form of knowledge sometimes depends on the extent of cultural capital (Bourdieu, 1986) – a theory by Pierre Bourdieu developed to expand the reach of critical theory. It is important to note that the horizontal discourse and its form of knowledge is not a focus here, as the interest is on the scientific discourse, which Bernstein calls the vertical discourse.

The 'specialised' vertical discourse is the discourse that is of interest as it contains the form of knowledge that learners do not often have access to. Specialised vertical knowledge can be contrasted with relativism and social constructivism as being "systematically revisable", "emergent". "real", "material" and "social" (Young & Muller, 2013). This discourse often closes the gap in instances where learners do not have that much cultural capital. Some examples of the forms of knowledge under the vertical discourse are, for example, sociology, mathematics, psychology, physical science, chemistry, and philosophy. The Bernsteinian theory also maintains that there are hierarchical and segmented structures under the vertical discourse, but this article will not expand on them as that is not the focus here. How does this relate to the use of technology? Perhaps it would be helpful for one first to highlight that technology has the potential to illuminate the difference between forms of knowledge and help learners to identify the relationship between concepts (epistemic structure) within a discipline and even across multiple disciplines (interdisciplinarity) (Weller, 2021). Below is an example of an activity where technology can support interdisciplinarity and identify the relationship between concepts.

> Learners are given a project based on the findings by the World Health Organization that fizzy drinks such as coke and other related products have too much acid in their contents than recommended (this will require them to use pH scales and other science instruments and virtual science laboratory [a combination of ICT and Science]). The second finding by an independent organization is that canned fizzy drinks are more preferred to plastic bottles (this will require them to know the exact dimensions, plans, and measurements of both containers). The learners must also bring 3D printouts of both containers (this will require them to use the latest technology and "design" using ICT skills. Engineering is also included in the design process) alongside a comprehensive scientific report of findings. The activity is inquiry-based and, therefore, will require learners to collaborate with other learners from different disciplines, and the STEM (Science, Technology, Engineering, and Mathematics) lesson will achieve its objectives.

The above activity requires of learners to engage with three disciplines of STEM, i.e. science (knowing the types of acids and contents of fizzy drinks), mathematics (measuring the dimensions), and technology (3D design in a computer). Moreover, the above activity is made interactive, collaborative, and authentic, and technology does not threaten the epistemology and knowledge structures of the disciplines involved. Instead, technology enhances learners' learning by relating the content to their everyday experiences, and the disciplines fill the gap if some learners do not have the accumulated cultural capital. Furthermore, learners can differentiate between the vertical and horizontal knowledge forms because the distinction thereof is made explicit in the project. This knowledge differentiation means that learners can also distinguish between the fizzy drink they drink (common knowledge) and the fizzy drink as a concern to WHO (World Health Organization) that they must investigate its contents (scientific knowledge). Once more, the above activity demonstrates that in blended learning, ICT strengthens the learning experience and increases student engagement. Blended learning guided by TPACK also promotes interdisciplinarity while not threatening the individual subject's epistemic structure.

8. The Technological Pedagogical Content Knowledge (TPACK) framework

Having touched on the importance of 21st-century skills when addressing the sociological concerns above, it is important to introduce an existing framework that has gained global traction because of its applicability, flexibility, and theory-underpinned nature. Mishra (2006) developed a framework that sought to address the complex challenges of the 21st century by foreseeing a future where almost every object (including human beings) is connected to another object. The framework he developed is called the Technological, Pedagogical, and Content Knowledge (TPACK) and is shown in Figure 1 below for a brief discussion.

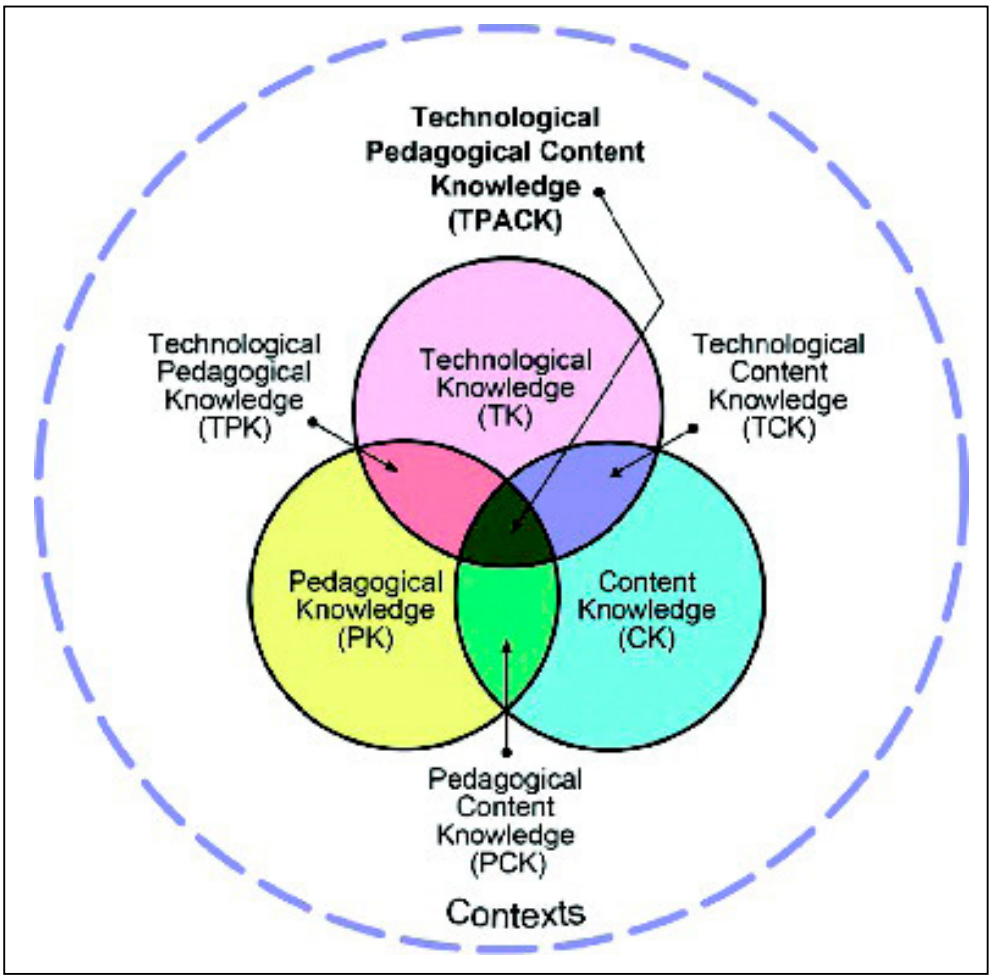

Figure 1: TPACK Framework by Mishra & Koehler (2006)

As seen from the TPACK framework in Figure 1 above, teachers ought to understand the different dimensions needed to solve the complexities of the 21st century. Figure 1 above is an extension of Shulman's (1987) work (Pedagogical Content Knowledge), and Mishra and Koehler (2006) added the technology aspect to the framework to cater for the challenges of

the 21st century and ensure that education does not suffer curriculum irrelevance (Gravett, 2019). Educators are different from other professions, not only because they possess scientific and theoretical content, but because they understand knowledge structures and organization. Since 2006, the TPACK has been critiqued and endorsed by the global education community, private organisations, the corporate sector, and other interested parties, and even featured prominently in technology and educator training studies (Chai, Koh & Tsai, 2013; Voogt *et al*., 2012). The TPACK highlights knowledge of **technology** (TK) about specific tools, software, and hardware, **pedagogy** (PK), how to manage, instruct and guide learners, and **content** (CK), about the discipline or subject matter. The relationship between TPK, PCK, and TCK is known as TPACK, and it analyses the intricate connections between all the component knowledge areas. Notably, these are part of the multidimensional framework in which educators function (Koehler & Mishra, 2008).

Drawing from the TPACK framework, technology equally has a vital role in blended learning. The role of technology in blended learning should be to enhance learners' learning. However, as alluded to before, technology does not replace bad teaching/teachers. This assertion means teachers should have relevant Pedagogical Content Knowledge (PCK). According to Shulman (1986), Knowledge of the content most important to its flexibility to be taught is known as Pedagogical Content Knowledge. The pedagogy, strategies, and teaching and learning techniques are influenced by the quality and quantity of the teacher's content on the subject. Regarding content knowledge, it is known how teacher expertise affects learners' performance, and studies have already been conducted that have emphasised pedagogical or content knowledge. According to Hill, Rowan and Ball (2005), Baumert *et al.* (2010), and Voss, Kunter and Baumert (2011), **pedagogical content knowledge** has more impact on student achievement than **content knowledge** only. As mentioned, an accommodative and inclusive design is needed in a course/module design; hence, the UDL instructional model becomes important to consider.

9. The Universal Design for Learning (UDL) framework

UDL is a direct product of the Center for Applied Special Technology (CAST) – an organisation founded in 1984 to "transform education design and practice until learning has no limits" (CAST, 2020: n.p.). Although the term UDL was adopted from universal design (UD) in the field of architecture (Dewi, Dalimunthe & Faadhil, 2018), UDL was created in response to educational and neuroscience studies, as well as the expanding importance of digital technology (Rose, Mayer & Gordon, 2014). Studies show that a UDL-based online course that is effective from a cognitive perspective frequently features relevant and valuable content, prompt and insightful teacher feedback, unambiguous instructions, course resources, and assignment boundaries (Chiu & Mok, 2017; Rogers-Shaw, Carr-Chellman & Choi, 2017; Chiu, Jong & Mok, 2020; Chiu & Lim, 2020).

There is significant growth in neurology, particularly research that intends to broaden understanding of how the human brain operates and what measures teachers need to take to cater for learners with disabilities in the digital/information age (Hartmann, 2015). Hence, Universal Design for Learning (UDL) is one of the necessary frameworks that guide the implementation of blended learning at universities. Learners have diverse characteristics, which might be seen from the difference in the capacity of intelligence, physical condition, senses, social status, ethnicity, culture, and gender (Ormrod, 2008). The diverse characteristics of learners call for a design of a blended learning approach, courses, and modules that will

include rather than exclude – "a barrier-free design" (Areekkuzhiyil, 2022:5). While using UDL to address access, presentation, and expression issues, it is crucial to note that UDL is not a framework only for the disabled (McKenzie & Dalton, 2020). Instead, it is a framework designed to cater for all learners, including those who might necessarily have learning disabilities. Some prefer to listen than read; some prefer to watch than read or listen. The following section will briefly discuss the UDL principles and their guidelines, which I think are essential to consider in a blended learning mode.

Firstly, it is significant to note that UDL should not be a one-size-fits-all approach. Each education institution has unique challenges ranging from administration, teaching and learning, research, *institutional culture*, and financial difficulties. The first UDL principle is **multiple means of representation**. This principle and its guidelines (perception, language and symbols, and comprehension) mean that content (text, pictures, videos, and other graphics) and assessments should be provided in a manner that will be adjustable by the user (CAST, 2020). Secondly, this principle suggests that if, for example, a module has a video, a transcript should be provided; if a module has a PDF document, a Word document should be provided. Concisely, every content should have an alternative format to increase student engagement, processing, and application (CAST, 2014). On the use of language and symbols, UDL recommends that "an important instructional strategy is to ensure that alternative representations are provided not only for accessibility but for clarity and comprehensibility across all learners" (CAST, 2020: n.p.). Instead of only providing a transcript for a video/audio and PDF or Word documents, several universities have integrated accessibility tools in their Learning Management Systems (LMS), such as Blackboard Ally, for alternative formats (Lesley University, 2023).

Multiple means of action and expression, the second principle of UDL, means modules must provide materials with which learners can interact. Furthermore, this principle suggests that a "workbook or textbook in a print format provides limited means of navigation (e.g. turning pages)" (CAST, 2020: n.p.). Therefore, "it is important to provide alternative modalities for expression, both to the level the playing field among learners and to allow the learner to appropriately (or easily) express knowledge, ideas, and concepts in the learning environment" (CAST, 2020: n.p.; Ralabate, 2011). Moreover, teachers ought to use various media to communicate the content of the module to allow learners with preferences and learning difficulties an opportunity to *participate equally* in the learning process. Furthermore, depending on the Learning Management System (LMS) used at an institution, engagement and collaborative tools must be used for learners to share ideas, review one another's work, and collaboratively work. In short, instructors must use different models with different approaches, skills, and strategies to demonstrate the same outcomes.

The sudden drop in student engagement (Strydom & Loots, 2022) is not surprising, because developing countries were not ready for such an immediate and sudden change in pedagogy and approach. **Multiple means of engagement**, as the third principle of UDL, becomes very important in this regard. Biney (2018: 43) argues that interest plays an essential role in student learning and ultimately in student engagement, and "if teaching is done when the learner is unwilling, this would amount to 'intellectual rape'". This emphasis on interest by Biney correlates to engagement, meaning that learners have an intellectual 'right' to engage in the learning process willingly and unforced and *fully* convicted that the learning process is

worthy, has a purpose, and is valuable (Fink, 2003). Interest in learning should be recruited through, for example, autonomous, relevant, and authentic learning tasks. Learners should know why they are engaged in learning and how it is relevant to them in the immediate future, if not in the long run. Threats and consequences of failing should not be used as the basis of why it is vital for learners to do a specific task.

It is crucial to briefly outline a way forward to consolidate the argument for an accommodative design in blended learning. The PCK, TPACK, and UDL must be used connectedly by instructional designers and teachers. Figure 2 below demonstrates such an interconnected module/course design focused on positive learning outcomes. Important to note about the illustration below is that each framework requires to be understood for its suggestions and implications to be correctly implemented. For example, teachers need to be trained on the Learning Management System (LMS), collaboration tools, assessment tools, etc., to be guided by the TPACK. Teachers also need to be trained beyond technology, i.e. to understand both the content and the pedagogy properly in order to understand how UDL can be incorporated into their teaching.

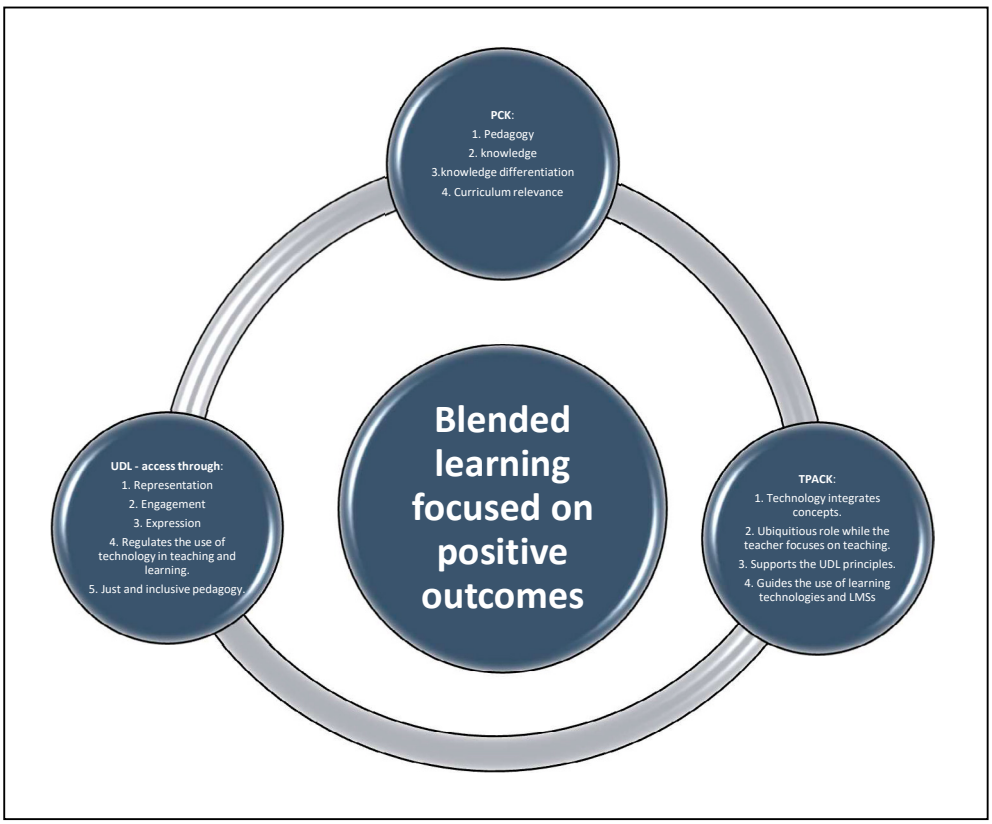

Figure 2: Complementary roles of the TPACK, PCK, and UDL frameworks.

10. Conclusion

In conclusion, it is recommended that universities deliberately explore the theory behind the selection and use of technology before developing and implementing teaching and learning policies. As mentioned in the first part of this article, universities, as singulars, are the 'thinktanks' of society and the developers of new knowledge (Edvardsson & Durst, 2017). Furthermore, higher education institutions in developing countries should prioritise the training of academics, support staff, and learners to realize the full potential of technology in learning and teaching. This training for staff and students has to range from the Learning Management System (LMS) of the university to applications and other third-party tools for which the university might have licences (Mpungose, 2020). Academics should understand the theory behind the selection and use of specific technologies. It is equally essential for higher education institutions to design training focusing on curriculum and pedagogy issues, as technology does not replace a poorly designed curriculum, nor does it substitute bad teaching.

To cater for all learners, including those with learning disabilities, UDL should not be understood and implemented as a one-size-fits-all approach. Some universities have used UDL to build courses and modules that follow some of the UDL principles. However, the lack of resources and skills continues to impede these attempts. Therefore, universities should customize UDL according to their unique needs. Moreover, access has different implications in various contexts. How access is defined in developed countries, where inequality is not the biggest in the world, differs from how developing countries define it. In developed societies, access may be spoken about only when learners with learning difficulties have issues accessing certain content. However, in developing societies, access also consists of the disadvantaged socio-economic backgrounds from which most learners come, as presented in the 2022 report by Strydom and Loots.

The practical recommendations that can be given are that (1) universities should not even consider returning to some of their old teaching and learning methods (overreliance on offline-based teaching), because COVID-19 demonstrated how rapidly everything can change. (2) Extensive training on digital technologies for academics, support staff members, and learners should be prioritised. (3) Universities should not ignore their primary reason for existing knowledge production and graduate learners who will contribute positively to the world. (4) Inclusive/accommodative design is still needed at universities in developing countries. (5) Inclusive and instructional pedagogy frameworks such as the Universal Design for Learning (UDL) should be thoroughly investigated by universities to customise these frameworks according to their contexts. In designing our courses and modules, we ought to understand that

> institutions of learning [need] to prepare learners for rapid economic, environmental, and social changes, for jobs that have not yet been created, for technologies that have not yet been invented, and to solve social problems that have not yet been anticipated (OECD, 2018).

We also need to understand that the way in which our modules and courses are designed directly impacts the students' success.

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