DECOLONISING EDUCATIONAL TECHNOLOGY IN A PRAGMATIC CURRICULUM: A SYSTEMATIC REVIEW

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ABSTRACT

A debate rages amongst educational technologists on keeping educational technology as a field of study, and non-educational technologists on defining educational technology as any usage of a technology in education. Since the emerging of the COVID-19, this debate has caused tension in higher education in terms of technology usage. This is because each of the two sides believes that its position in the debate represents an objective reality of quality educating. This tension has motivated this study to decolonise educational technology in a pragmatic curriculum based on scholarly publications published during or post the COVID-19 revolution. A pragmatic paradigm and the natural identity framework (NIF) were used to encase this study. A systematic review with text analysis and document review were applied in processing data from 15 purposively and conveniently sampled publications for this reported study. The findings indicate that most of the technology usage promoted a performance-based (field of study) and/or competence-based (solely technology usage) curriculum at the expense of the pragmatic or natural curriculum that promotes personal or natural identity. This suggests that higher education was only addressing professional needs in terms of "what" questions, and/or societal "how" questions. A pragmatic curriculum is driven by the importance of actions (educational technology as a field of study),

beliefs behind the actions (pragmatic), and their outcomes (usage of a technology). This study therefore recommends the use of a pragmatic curriculum and awareness of natural forces/laws that promote natural actions, thus addressing personal needs through personal "who" questions, and natural needs through "why" questions.

Keywords: curriculum, decolonization, educational technology, natural identity, objective reality

INTRODUCTION

A curriculum is a plan for/of educating (teaching, learning, and research) that incorporates educational technology (ET) (Khoza). The incorporation of ET into a curriculum produces performance-based, competence-based, and/or pragmatic approaches to educating. On the one hand, in a performance-based curriculum, ET is defined as a field of study that conducts and prescribes theories of integrating technologies into education (Jenkinson 2009; Khoza and Biyela 2020). A performance-based curriculum is prescriptive or structured in addressing descriptive "what" questions, such as: what content, what resources, what objectives, what assessment and others (Makumane 2021; Tyler 2013). Mishra, Koehler, and Kereluik (2009, 48) define ET as "the study and practice of facilitating learning and improving performance by creating, using and managing technological processes and resources". The curriculum in higher education is predominantly driven by a prescribed learning management system (LMS) mostly monitored by educational technologists. On the other hand, in a competence-based curriculum, ET is defined as the usage of technology in education (hardware and software resources) (Reinhold et al. 2020; Lee and Reeves 2007). A competence-based curriculum addresses operational "how" questions such as: how is learning facilitated, how do students construct knowledge to achieve learning outcomes, inter alia (Bernstein 1999; Shoba 2021). Spector (2001) sees ET as the technification process of education when incorporating a technology. The curriculum is largely dominated by a social media site (SMS). However, these two positions, performance-based and competence-based approaches, have long been contesting and placing ET at the crossroads of the two ET definitions. In other words, the performance-based approach deals solely with the "what" question in education, while the competence-based approach addresses the "how". This seems to create an imbalance in what Biesta (2015) terms "good education", which is seemingly attained when the "what" and the "how" in education are merged to produce a "who" question. Thus, both approaches must be harmonised through creating a pragmatic curriculum capable of decolonising education (Reigeluth 1989; Khoza and Mpungose 2022). A pragmatic curriculum addresses personal "who" questions such as: who is teaching, learning, responding, and so on (Khoza and Biyela 2020). Decolonising is a process of reflecting on and critiquing educational resources in order to renew them according to the

needs of educating (Khoza and Biyela 2020). Decolonising involves theories relevant to the needs of both staff and students through individual self-reflection and critiques (Wilson 1997; Lee 2013; Makumane, Khoza, and Zuma 2022). Therefore, this study aims to decolonise educational technology in a pragmatic curriculum, based on scholarly publications published during or post the COVID-19 revolution, through addressing the following two research questions:

- What are the potential limitations of standardized approaches to educational technology (ET) in higher education institutions (HEIs); tools, theories, and assessment methods that may hinder creativity, flexibility, and inclusivity.
- How do power dynamics and potential negative impacts of community-driven approaches to educational technology (TIE) usage outside prescribed rules can lead to control, oppression, and anxiety among users.
- How users pragmatically choose and use educational technologies based on their internal intelligence and alignment with their needs, regardless of prescribed approaches or theories.

LITERATURE REVIEW ON ET

Since the 1980s, educational technologists have been observing what they identify as ET at the crossroads; because non-educational technologists (people from other fields) seem to show interest in the field (Khoza 2021; Reigeluth 1989; Percival and Ellington 1988; Branch 1997). However, these same technologists show little interest in ET as a field of study through its research and theories, not being aware of them. For example, in the 1980s, when the government of the United States of America (USA) funded its first educational technology centre (ETC), this funding was awarded to Harvard University without considering available educational technologists in the USA. Even five years later, when the then leading universities of ET (Indiana University, Northern Illinois University, Syracuse University, University of Georgia, and University of Minnesota) had to bid for their funding, such was not awarded to them.

"In November 1988, the North Atlantic Treaty Organization [NATO] held an international conference on New Directions for Educational Technology. Out of about 25 participants, three or four were educational technologists" (Reigeluth 1989, 67). Other ET conferences were not held after having taken place about 13 times/over 13years. Educational technologists believed that these conferences were dominated by non-educational technologists unaware of the field.

Those institutions that decided not to support the NATO conference were the International Conference on E-Learning (ICEL) and South Africa International Conference on Educational Technologies (SAICET) (Khoza 2018; Khoza and Mpungose 2017). This situation generated a new dominant direction for ET in which some higher education institutions (HEIs) phased out ETCs. This was because they did not see value in them, all university fields believing that they were properly using technology in education (TIE) with or without ETCs. The University of KwaZulu-Natal (UKZN) in South Africa (SA) is one of the HEIs that phased out its ETCs in 2005, in 2010 merging its Educational Technology discipline with the Curriculum Studies discipline (field). All disciplines of the HEI had to find independent ways of using TIE.

TIE is one of the two components of ET which is divided into hardware (HW) (machines/tools used in education) and software (SW) (materials used in conjunction with HW to carry information). The other major part of ET which has been largely ignored by non-ET fields is technology of education (TOE), ideological-ware (IW), or technology of self (Percival and Ellington 1988; Khoza and Biyela 2020; Czerniewicz 2008). TOE consists of ET research and theories that seem to be of little interest to non-educational technologists. In other words, ET has become more about the use of HW and/or SW in education rather than in conducting research and producing theories that guide the usage of HW and/or SW technologies. This practice suggests that education is about technologies (TIE) instead of about ideologies (TOE or IW). Such an idea contrasts with aims of ET that promote research work producing theories relevant to TIE to be used in teaching, learning, and research (educating) (Amory 2010; Arnold and Sangrà 2018; Branch 1997; Khoza 2021). An ET field of study conducts research to produce theories that formulate an objective reality of educating (Czerniewicz et al. 2020; Makumane et al. 2022; Luppicini 2005).

An objective reality of educating should be that students are taught, and that all achieve one hundred per cent (100%) in their courses; if not, both TIE and TOE may be similar to any other user interfaces accessed for survival (Prakash et al. 2021). No field has ever produced a class in which all students achieved 100 per cent in a course even when facilitated through the integration of TOE and TIE. Consequently, other fields seem not to recognise ET as a special field that produces theories for objective realities. According to Khoza (2023), an objective reality of educating may be achieved when education research and theories take natural actions into consideration. As a result, a natural identity framework (NIF) used in framing this study seems to signal a new way of scrutinising the education process.

THEORETICAL FRAMEWORK (NATURAL IDENTITY FRAMEWORK)

The NIF is underpinned by societal, professional, and personal identities (Figure 1). The three

principles of NIF must be properly defined before any educating takes place. A societal identity is the process of recognising the importance of societal contributions to educating. The societal identity addresses operational "how" questions through knowledge constructions

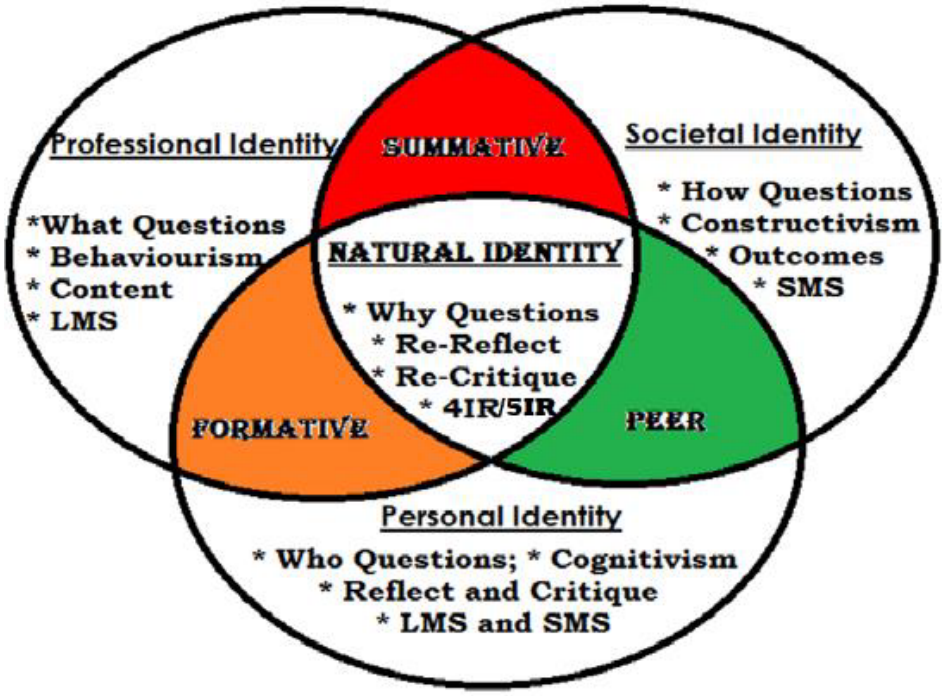

Figure 1: Natural identity framework (NIF) adapted from Khoza (2021, 4)

(constructivism). Achievement of learning outcomes becomes the driver of societal identity through unprescribed TOE and/or TIE such as various social media sites (SMSs). Through activities facilitated by academics so that students achieve learning outcomes, students generate course content, which in turn will be prescribed for future educating by those in favour of a professional identity.

A professional identity is driven by prescribed course content. Professional identity is defined as a system of recognising the importance of professional contributions in educating that address descriptive "what" questions through mastering course content according to academics' instructions. The change of behaviour through prescribed course content mastering using prescribed TOE and/or TIE as a learning management system (LMS) becomes an objective of educating. This objective contributes towards achievement of aims of educating that address personal needs.

Addressing personal/individual needs is a function of personal identity in which staff and students self-reflect and critique their lived experiences in order to transform or produce new knowledge relevant to their unique internal intelligence and situations. Individual unique needs determine whether one leans more towards issues of a professional identity (such as content mastering through LMS) than to a societal identity (such as achievement of outcomes through

SMS), or vice versa. Professional identity addresses personal needs through peer, formative, summative assessment, and "who" questions of educating. The self-reflection processes occur in the individual human mind which is either unconscious, subconscious, or conscious. The unconscious part of the mind manages all bodily functions through its deoxyribonucleic acid (DNA) (Iseli 2014). Each individual human has unique DNA that enables the person to generate all bodily actions such as breathing, digestion, heartbeat, movement, and more. From conception, the unconscious mind manages all bodily functions naturally without being taught by any external factor. In other words, the unconscious mind is the original unique identity of each human or species produced through heredity (naturally passing genetic information from parent to offspring).

When the bodily functions occur whilst managed by the unconscious mind, they are simultaneously recorded or stored by the subconscious mind (Khoza 2021). The subconscious mind is a permanent memory that stores every experience from the moment of conception (Alsharif, Md Salleh, and Khraiwish 2022). Experiences include beliefs, emotions, feelings, and superstitions, inter alia. This suggests that the subconscious mind is a function of both heredity and environment (conditions in which species live). Through heredity and environment, the human subconscious mind produces various curriculum actions that must be guided by the conscious mind (Khoza 2023; Hart 1910). A conscious mind is that part of human reasoning, thinking, that deals with intellectual processing of various pieces of information at a time (Ramsøy, Michael, and Michael 2019). In other words, the conscious mind assists the subconscious mind in distinguishing between reality and what is not real information; such is used to generate actions based on various TIE and/or TOE during processes of self-reflection. During these processes of self-reflection, humans apply the conscious mind to interrogate the subconscious (mind) thoughts in order to adjust for new actions based on specific technologies.

However, even after these three identities have been defined, one may not achieve an objective reality of educating if one is not aware of natural forces/laws that may influence the system or process of educating. The natural identity may be understood through ongoing reflections and critiques with accountability (Waghid 2019). Such would be based on the dominating revolutions such as the Fourth Industrial Revolution (4IR) or Fifth Industrial Revolution (5IR). The aim would be to pragmatically align more closely with one's individual unique objective reality (Khoza 2023; 2021; Schwab 2016).

RESEARCH DESIGN WITH METHODOLOGY

A pragmatic paradigm used to frame this study focuses more on practical actions of researchers and participants (usage of TIE), TOE (beliefs/theories) who drive the practical actions and

outcomes or results of the actions. The study's epistemology is determined by what researchers and participants see as relevant to the situations that must be addressed. Pragmatists believe that there are multiple realities in which every individual has unique interpretations of such realities (Zuma, Khoza, and Sokhulu 2022). This paradigm is important for this study because it supports either the quantitative or qualitative methodological paradigm, or both in one setting. The paradigm supports studies to be conducted for the benefit of people, based on their natural internal intelligence. This suggests that the pragmatic paradigm supports any form of sampling.

Purposive and convenience sampling were used to select fourteen (14) most accessible articles/publications on education/curriculum studies of the 920 articles displayed on various search engines. These included EBSCOhost, Eric, Sage, Taylor & Francis, ACM Full-Text Collection, IEEE Xplore, Science Direct, Springer Link, Scopus (the database), as well as Google Scholar on ET. The articles were examined by means of a systematic review through text analysis. A systematic review through text analysis is a process of extensive analysing of text available, or published research based on defined, systematic methods in order to understand the representation of a phenomenon, thereafter addressing specific research questions (Zuma, Khoza, and Sokhulu 2022). Publications (articles) and other texts were analysed according to either the TIE (competency-based theory of using technologies), TOE (performance-based theories of using technologies), or per a combination of the two.

Inclusion and exclusion criteria

This study is a systematic review of literature in order to decolonise ET in a pragmatic curriculum as witnessed in scholarly publications. The pragmatic curriculum came to the rescue of educating during and post the COVID-19 revolution, within the context of educational institutions. Thus, all articles/publications selected and included in this study involved ET during and post the COVID-19 revolution as part of the inclusion criteria. Research reviewed in this study was all conducted during 2020, 2021, 2022, and 2023, the periods during and post which COVID-19 was rife but manageable. Articles that were published in the years prior to this period were excluded from the review (exclusion criteria). Thus, the systematic literature review articles followed the NIF principles (professional, societal, personal, and natural identities).

Data base and time frame

Search engines were used to retrieve articles included in the study. ACM Full-Text Collection, EBSCOhost, Eric, Google Scholar, IEEE Xplore, Sage, Science Direct, Scopus (the database), Springer Link, as well as Taylor & Francis, were used to retrieve open-access journal articles

that involved ET issues. Some 14 journal articles (Abad-Segura et al. 2020; Al-Malah, Majeed, and ALRikabi 2023; Bedenlier et al. 2020; Bond et al. 2020; Bozkurt 2020; Breines and Gallagher 2023; Chen et al. 2020; Christopoulos and Sprangers 2021; Fernández-Batanero et al. 2021; Lutfiani and Meria 2022; Renz and Hilbig 2020; Tuma 2021; Vlachogianni and Tselios 2022) were purposefully and conveniently selected for the study. The search engines were screened between 12 January and 06 April 2023 in selecting articles relevant to the study. In identifying relevant and available literature for the study, key definition words such as ET, TIE, TOE, and ET were entered into the search engines. A spreadsheet listed all the publications. However, only publications on ET or TIE/TOE were selected (14 publications) (Figure 2).

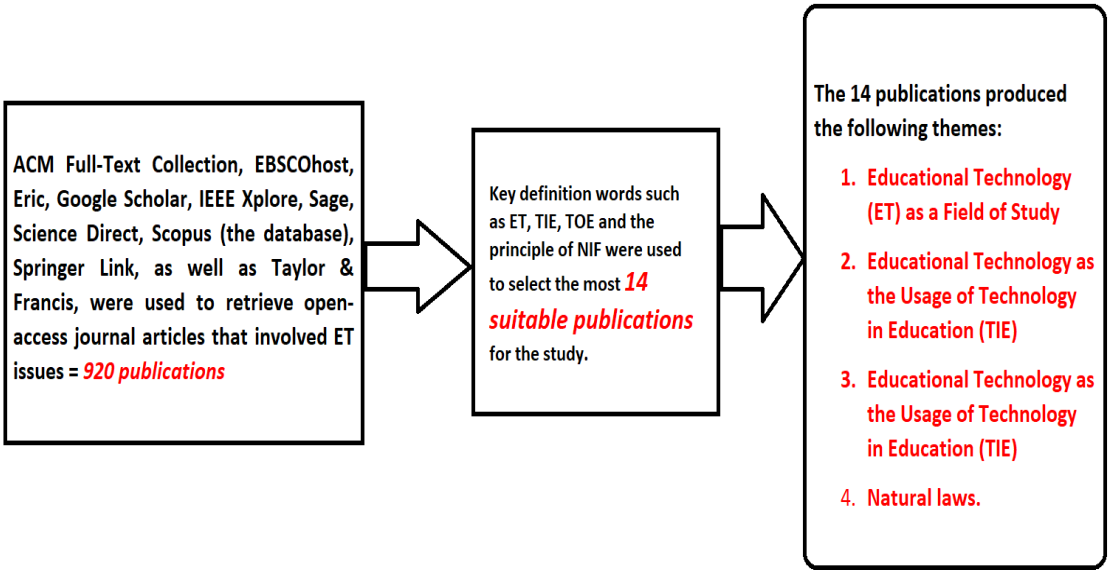

Figure 2: Flow Chart

Validity/Trustworthiness

Four principles of trustworthiness were taken into consideration to ensure dependability (consistency through the use of direct quotations), transferability (applicability of the study to various contexts), confirmability (elimination of bias through triangulation), and credibility (truth value, including having authors of some of the analysed publications authenticate the findings). Through a guided method of data analysis, data on ET issues were interrogated to produce themes of the findings. These findings are presented in the next section on findings and discussions. Although these data sources were in the public domain, authors of some of these publications were communicated with to gain clarity on certain issues they raise, and also to address the issue of ethics

RESEARCH FINDINGS WITH DISCUSSIONS

The data in Table 1 are used to generate findings for this study. The findings are categorised and presented as four themes which were evaluated by means of the principles of the NIF. The themes are: the ET as a field of study; the ET as the usage of technology in education (TIE); the ET in a pragmatic curriculum; and natural forces/laws. Findings from the publications are presented and recontextualised within relevant literature and/or the NIF of each of the themes.

Table 1: Themes and Categories

Theme	Category
Educational Technology (ET) as a Field of Study	• ET Theories (TOE) • Summative assessment
Educational Technology as the Usage of Technology in Education (TIE)	• Hardware and software • Peer assessment
Educational Technology as the Usage of Technology in Education (TIE)	• Self-reflection and critique • Formative assessment
Natural laws	• Values

Educational Technology (ET) as a field of study

ET as a field (discipline) of study accepts that educational technologists guide the usage of such current technologies. These technologists conduct research on current technologies (TIE) used in education in order to generate theories (TOE). Theories are prescribed for all technology consumers who can use the technologies as set by educational technologists. Their usage becomes a standardised system of applying technologies according to the ideologies of the educational technologists who prescribe them and train the users. The system becomes easier for the technology users after using the same technologies for a long time, based on the prescribed theories. The system is capable of addressing challenges of educators who are unable to select the correct application (TIE and TOE) for their specific educational purpose (Tuma 2021).

A study conducted by Tuma (2021, 232) concluded that "the impact and optimal use of various technology applications are not clearly defined" when there are no educational technologists. Educational technologists are able to create interventions centred on self-led learning; and improvements to instruction for high performance (Rodriguez-Segura 2020). This suggests that ET as a field of study is capable of advancing HEI usage of TIE with TOE. This occurs through development of specific interventions that address the needs of the HEIs based on some ET theories (TOE).

ET Theories (TOE)

Most of the known ET theories appear to apply some of the curriculum concepts proposed by

Van den Akker (2003). This researcher depicts such concepts as a curricular spider web (educating rationale, goals, resources, activities, environment, assessment, role, time, and others). In support of the curricular spider web, some scholars (Berkvens, Van den Akker, and Brugman 2014; Khoza 2019; Makumane 2021; Mpungose 2020; Ndlovu 2023; Sokhulu 2021) have used this depiction in their research when analysing experiences of academics and students. Some examples of theories apparently developed through some of the curriculum spider-web issues are connectivism (Siemens 2005); cultural historical activity theory (CHAT) (Stetsenko and Arievitch 2004; Sannino and Engeström 2018); community of inquiry (CoI) (Garrison, Anderson, and Archer 2010); technological pedagogical content knowledge (TPACK) (Schmidt et al. 2009), unified theory of acceptance and use of technology (UTAUT) (Chang 2012); natural identity framework (NIF) (Khumalo, Shoba, and Khoza 2023); and others. Table 2, shows how curricular spider web concepts are represented in these theories:

Table 2: Curricular Spider Web concepts in Theories

Concepts	Connectivism	CHAT	CoI	TPACK	UTAUT	NIF
Rationale	Networking	Transformation	Balance of Presences	Knowledge production	Experience of accepting technology	Identity, reflection & critique
Goals	Principle 4	Outcomes	In Presences	Pedagogy	Values	Goals
Content	Principle 2	Object	In Presences	Content	Performance or change of behavior	Content
Assessment	Principle 8	Rules	In Presences	Pedagogy	In UTAUT	Assessment
Resources	Principle 3	Tools	In Presences	Technologies	In UTAUT	Resources
Roles	Principle 5	Division of labour (actors)	In Presences	Pedagogy	In UTAUT	Roles
Community	Principle 1	Community	In Presences	Pedagogy	Social influence	Community
Location	Principle 6	Rules	In Presences	Pedagogy	In UTAUT	Environment
Activities	Principle 7	Activities	In Presences	Pedagogy	In UTAUT	Activities
Time	Principle 7	Rules	In Presences	Pedagogy	In UTAUT	Time

These concepts are represented in all the theories by means of various terminologies. For example, connectivism has eight principles that represent the curricular spider web concepts, such as with the other theories. This suggests that most ET theories are generated through new ways of rearrangement or repositioning of the curricular spider web concepts. This further suggests that ET as a field of study may be limited to these curricular spider web concepts that seem to be setting the boundaries for the majority of ET theories. The theories apply a simple language related to the repositioning of the concepts in educating.

However, ET may narrow down the creativity of other fields. It may rely heavily on educational technologists for training a new TIE guided by theories that seem to reposition the

curricular spider web concepts. Other prescribed rules or theories of using TIE may be overwhelming to non-educational technologists (Vlachogianni and Tselios 2022) who may decide not to follow them because they are not familiar with their concepts. For example, such technologists may be given rules for using PowerPoint presentation software, such as not overcrowding the slides. This may be a challenge: it may be tempting for technologists to overcrowd the slides if they have overly much information to present. While this practice may be a challenge to educational technologists, it may not be a challenge to non-educational technologists.

Over and above this, sometimes certain terminologies used by other fields may differ from that of ET; and may cause an amount of confusion in the system. For example, the discipline of computer science defines software as the commands that produce a computer programme such as application or management software; while ET defines software as any material that carries and displays information from a hardware device. This suggests that educational technologists should customise the research work they conduct on the usage of TIE/TOE according to the fields that plan to use TIE, so as to avoid possible confusion.

HEIs do not seem to consider these challenges when they prescribe predominantly learning management systems for usage (LMSs). LMSs seem to be prescribed or mandatory in the form of a one-size-fits-all approach. All fields have to use LMSs irrespective of whether these meet their needs. For example, some fields may need an LMS that uses modern languages in order to incorporate social media sites (SMS); while their HEIs prescribe LMSs that do not have this feature. While LMSs such as Canvas use modern languages, others such as Moodle use old languages that may not allow the incorporation of SMSs (Mpungose and Khoza 2022). HEI-prescribed LMSs are usually dominated by summative assessment strategies that use replicative processes.

A *summative assessment* is a system for gathering, storing, and processing information on students' cognitively mastering prescribed content of their courses. Such data collection enables the grading of the students. Figure 3 shows some examples of summative assessment activities/resources generated by one LMSs, Moodle.

The activities include QPA questionnaires (from the quality assurance section) to be completed by students in evaluating their courses for improvement. In most HEIs even this course evaluation questionnaire is framed by some of the curricular spider web concepts, such as content, assessment, goals, academic role, inter alia. In other words, questions are formulated on these concepts.

These resources/activities may produce various summative assessment strategies such as

tests, quizzes, Kaltura video quizzes, examinations, and others used by HEIs. A summative assessment is a common concept of ET as a field of study and ET as the usage of TIE; the definitions of grading the students (Khoza 2017).

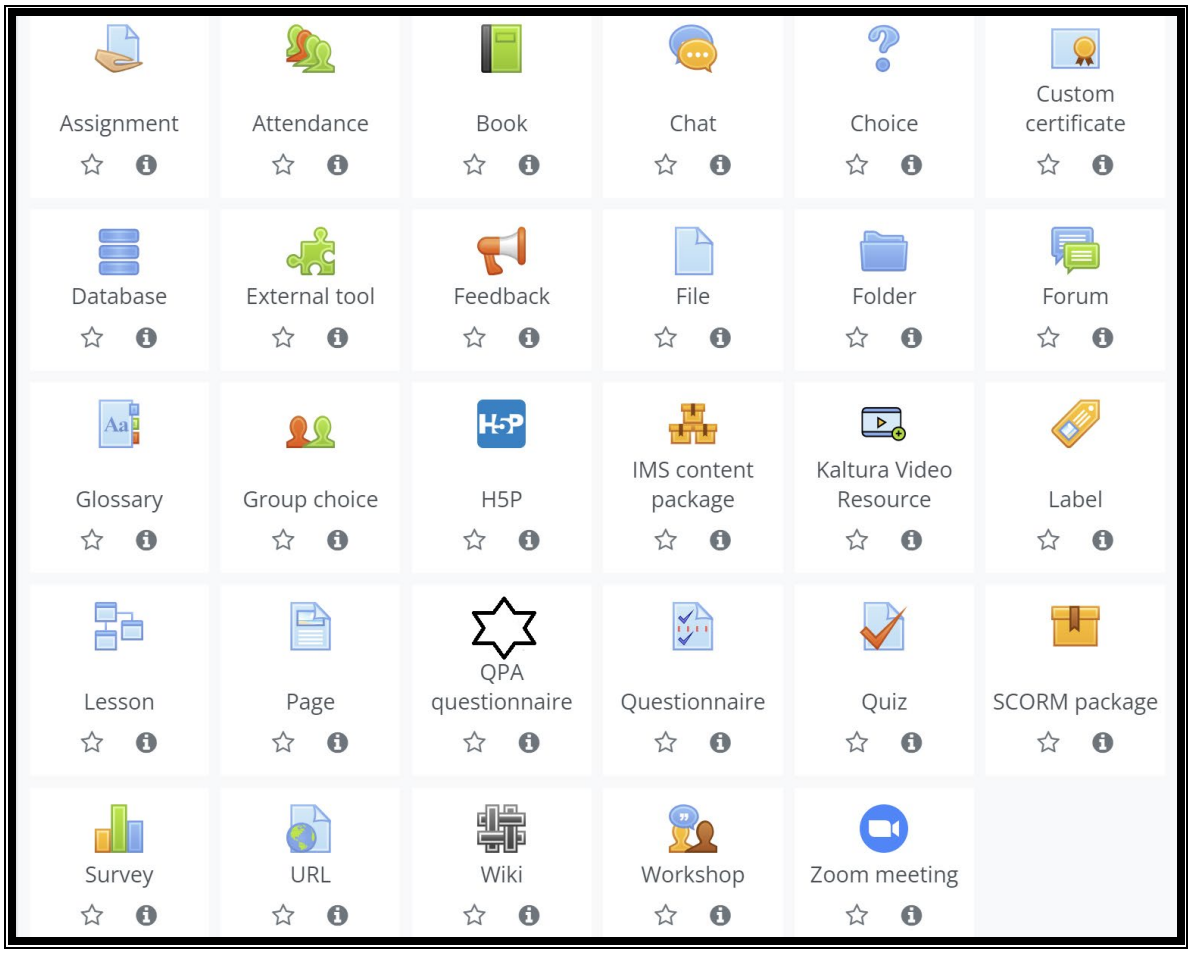

Figure 3: Some of the LMS (Moodle) activities/resources

Educational technology as the usage of Technology in Education (TIE)

The usage of TIE (*hardware and software*) outside prescribed ET rules, or TOE, seems to be dominated by SMSs that promote a community-driven approach (Breines and Gallagher 2023). In a community-driven approach, outcomes become the end goals of any actions. In other words, any technology identified as a useful technology with an outcome seen as positive by community members, may be accepted as the technology that helps the community with objective realities. Those who have power seem to be predominantly supported by communities in terms of their technologies; while technologies of those with lesser power seem to discontinue or close down in the absence of ET-prescribed theories or rules of technologies. For example, in the 1980s Microsoft Office (founded by Bill Gates and Paul G. Allen in 1975) was contesting with Novell Office (founded from 1980 to 2014 by George Canova and Jack Davis), and StarOFFICE (1985–2009) to become the office of choice. The other two offices

were discontinued when Bill Gates became one of the wealthiest businessmen globally. The world seems to be observing the same with the contestation between Skype (founded by Niklas Zennstrom in 2003), Zoom Video Communication or Conferencing Technology (ZVC) (founded by Eric Yuan in 2011), and Microsoft Teams (founded in 2017). Microsoft Teams was developed in 2017 after the afore-mentioned two technologies; nevertheless Microsoft Teams seems to be one of the world's most popular video communication or conferencing technologies, being supported by Microsoft Office.

The usage of unprescribed technologies (hardware and software) may therefore come from anyone and be used by those individuals to claim power over others. When some individuals gain power over others through technologies, they attempt to control the world. Bedenlier et al. (2020) found that this practice of TIE promotes behavioural engagement and oppresses affective engagements. A study conducted by Fernández-Batanero et al. (2021) on the impact of ET on academics, found that academics present high levels of anxiety or stress due to their use of educational technology in the classroom when not guided by educational technologists.

In the absence of educational technologists, academics rely on their peers for help in the form of *peer assessment* which involves applicative processes of facilitating educating. Both the peer and summative assessment strategies may be supported by a formative assessment in a pragmatic curriculum in which self-reflection and critique are dominating the field of educating.

Educational technology in a pragmatic curriculum

Affective engagement in the use of technologies whether prescribed or not allows users to self-reflect and critique their experiences with accountability based on their unique needs before they choose and use certain technologies. Technology users pragmatically choose and use TIE (hardware/software) and TOE (theories) that uniquely and practically work for them based on their internal intelligence (Renz and Hilbig 2020; Christopoulos and Sprangers 2021). In other words, the users use what they believe offers evidence of the alignment between the technologies and their unique needs. Their individual unique beliefs and evidence apropos of specific technologies are driven by relevant approaches/theories (Abad-Segura et al. 2020). Users use *self-reflection and critique* of their experiences based on formative assessment to facilitate the alignment of their needs with technologies. A *formative assessment* is a question used to establish whether people are cognitively ready for the next actions without necessarily grading them. For example, greeting students (formative assessment) may help academics to understand whether their students are ready to learn. However, even tests (summative assessment example) may be used as formative assessment strategies if they are not used for

grading. This suggests that formative assessment naturally drives human actions (natural laws).

Natural laws supersede both the beliefs and evidence that process theories of technology usage (actions). For example, Eric Yuan (the founder of ZVC) may have created the ZVC guided by his unique needs. However, he can also only operate ZVC under naturally relevant conditions even though he is closer to its objective reality (voltages and circuits of ZVC). Yuan cannot change the conditions of the universe: he has to align the ZVC with the conditions of the universe. A study conducted by Fennell and Simpson (2021) on technology usage for liberal arts, found that people may learn to use TIE/TOE naturally, associatively, and interpretively, even while forgetting much of the content studied and assessed through replicative and applicative processes or systems used in schools. This suggests that the subconscious mind naturally records every action experienced to produce specific *values* for associative and interpretive actions.

However, people have to engage self-reflecting and critiquing processes in order to understand subconscious thoughts that produce unique human values (e.g., patience, integrity, honesty, and others) through human beliefs or evidence. Although self-reflection and critique assist people to understand their value, some may find it very difficult, if not impossible, to remember or recall where or when they generated such values, these values being naturally driven. Educational institutions only teach students the course content, not the values. Values are generated through beliefs and/or evidence (Biesta 2015; Vlachogianni and Tselios 2022). Beliefs and evidence may inform each other (Gatley 2022). For example, someone may not believe in Samsung-generated evidence (belief informs evidence). Consequently, when this person is taught about the existence of the Nile River through photographs and videos taken per a Samsung phone, he or she may not generate any value based on such evidence, even should evidence be present. On the contrary, the same person may only believe in evidence generated by an iPhone, or believe in opinions from elders (evidence informs belief).

However, although being closer than others to knowing an objective reality of a technology makes one fitter in one's actions, our level of experience should naturally graduate from one level to the next, sans compulsion. One's experience does not compel one to graduate when one is not ready. Such may damage one's ability to enjoy the suspense that accompanies natural graduation. For example, those not computer engineers/scientists may rely heavily on the desktop icons in completing their work. The icons are user interfaces for application users; however, they are not the truth (objective reality) of the application software they represent. Demanding that application users whose levels of computer experiences remain at the icons use programming languages or voltages/circuits (objective reality) with application software, may permanently discourage them from naturally graduating to computer engineer or scientist levels

of experiences. The users may see this practice as an impossible task, seeking alternatives, leaving the job undone.

CONCLUSION AND IMPLICATIONS

Educational Technology (ET) in a pragmatic curriculum produces self-reflective platforms or spaces that harmonise the contestation between educational technologists and non-educational technologists. Technology in education (TIE – competence-based for operational "how" questions) and/or technology of education (TOE – performance-based for descriptive "what" questions) users start educating by self-reflection and critiquing of their lived experiences with accountability. This is in order to choose and use TIE and/or TOE relevant to their unique needs and situations. Such a choice is irrespective of whether the TIE/TOE comes from educational technologists. Educational technologists use their unique needs in deciding whether to concentrate on TIE/TOE for the content of the systems or for the outcomes. For example, if one wants to add three people to four people in a room, one will have to follow a system of counting each one of them in order to arrive at seven people (3 people + 4 people = 7 people). The answer or outcome (7 people) of the system becomes a dependent variable/factor; while the 3 people + 4 people becomes an independent variable/factor of the system that decides the correct answer. Even if one wants to count drops of liquid in a container, one will have to count these drops during the action of pouring them into the container, recording the answer. This is because the outcome (inside the container) may suggest one drop (1 drop) while pouring 3 drops + 4 drops = 7 drops.

Therefore, ET as a field, may prioritise a TOE (theory) that privileges 3 + 4 (system content), while other fields prioritise a TIE that privileges 7 (outcome). However, decolonising ET in a pragmatic curriculum (for personal "who" questions) may prioritise/privilege a TIE/TOE relevant to educational needs that combines both the system content (3 + 4) and the outcome (7). This suggests that none of the two definitions of ET produces objective realities of educating (production of 100%). Even if the two definitions are pragmatically combined, there is still a need for the TIE/TOE users to acknowledge natural forces/laws that may deflect educating actions from producing 100 per cent. In other words, users should be aware that ET only produces user interfaces, not educational objective realities. What seems to be closer to the educational objective reality is an optimisation of both the educating systems and outcomes when ongoing self-reflection and critique are able to address the philosophical "why" questions.

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