Journal of Vocational, Adult and Continuing Education and Training

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The Journal of Vocational, Adult and Continuing Education and Training (JOVACET) recognises the need for critical engagement through studies in technical and vocational education and training (TVET) and adult and continuing education and training, and for encouraging critical scrutiny of this expansive knowledge area on the African continent.

The voices and experiences of practitioners, reflecting on all aspects of teaching and learning within vocational education and adult education settings, should be heard through the publication of empirical and robust research. While the journal wishes to take forward academic scholarship, it also seeks to strengthen opportunities for reflective practice that makes a scholarly contribution to the field. New knowledge emerging out of complex developmental contexts has significant value and needs to be showcased beyond existing geographical and political boundaries. The journal is therefore committed to also supporting the development of emerging researchers by providing them with a space to present and defend their research amongst a network of global scholars. Within the field of vocational and continuing education there is substantive 'grey literature' that remains in project report form. The journal is potentially a vehicle for the translation of this important work into an academic contribution to a wider community of practice, thereby enhancing its value.

DISCLAIMER

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IN MEMORIAM:
ANDRE VAN DER BIJL (PhD)

On 13 October 2020, just over a year ago to date, and amidst our Covid-19 pandemic, one of our founder editorial board members and a good friend, Dr Andre van der Bijl sadly succumbed to cancer after a brave battle with his illness. At the time our 2020 issue of JOVACET had already gone to print, and so the journal was not able to acknowledge his passing, hence our tribute to him in this subsequent issue.

Andre spent many years at the Cape Peninsula University of Technology engaged in teacher education, capacity building of TVET college lecturers, and research in the vocational education sector. In the small South African community of university academics passionate about TVET development, Andre was a stalwart. We participated together in numerous vocational education forums over many years, especially in the lead up to the policy on professional qualifications for lecturers in TVET. Andre worked tirelessly in initiatives towards the development of the new qualifications, eager to see national recognition finally being given to the long-neglected college teaching cohort. Andre was a keen raconteur with a mischievous sense of humour, and always had a story to tell. Even when disagreeing he was never disagreeable, and would willingly concede once he had been convinced of a position. TVET has lost an academic and an advocate who still had so much more to give. We mourn his passing and salute his contribution to the TVET research and development domain. Andre will be remembered with great fondness and much respect.

Joy Papier
Editor-in-Chief: JOVACET

EDITORIAL

Joy Papier
Editor-in-Chief

It is with great pleasure and a sense of relief that we present this fifth issue of JOVACET. The COVID-19 pandemic has had far-reaching repercussions on every aspect of life the world over, including in academia. Practitioner researchers in education and training, in particular, we are informed, have been preoccupied with the many challenges of remote teaching and learning and keeping academic programmes on track, which have necessitated relegating those well-intended papers for publication to the back burner. We are therefore exceedingly grateful to those authors who managed to submit their articles for this issue earlier this year and who stayed the course of the lengthy peer-review process towards achieving the final product.

In spite of the pressure on academics, though, we received many submissions for this issue. Part of the reason for this has to be attributed to the emerging writers' workshops held online in 2020 over a period of four weeks, for which we engaged respected scholar and prolific author Prof. Jonathan Jansen as facilitator. The workshop was aimed particularly at emerging writers and was attended by about 60 participants. Potential articles for the JOVACET 2021 issue that could be completed within the journal's time frames were accepted. Authors were then offered a further opportunity during the first half of this year to be mentored by Prof. Jansen for a period of six weeks in order to complete their articles and navigate their way through the peer-review cycle. Authors who were part of the process, some of whom had published previously, reported that they had benefited immensely from the sharp critical input and the expert oversight to which their articles were subjected. This has certainly been a wonderfully productive initiative that JOVACET would be keen to repeat.

Turning to the articles in this 2021 volume, I'm pleased to report that a fairly even spread of topics covering TVET and Adult and Continuing Education emerged from the successful

peer-review process. Here again we must acknowledge our peer reviewers and editorial committee members who were willing to go the extra mile to assist us in meeting our time limits. Some articles went back and forth between reviewers and authors, testing the patience and the resilience of both parties, whose perseverance we deeply appreciate.

Two articles cover the topic of adult educators in community education and training centres, but from different perspectives. Hendricks and Aploon-Zokufa reflect on the process of curriculum building for a planned new adult educator qualification – the Diploma in Adult and Continuing Education and Training (ACET) – and consider the various 'drivers' that may influence the way a curriculum is implemented and received at the point of delivery, notwithstanding the lofty intentions expressed in policies. They draw on work done in an existing training programme for adult educators to illustrate the powerful experiential knowledge that educators at community sites of adult education have acquired. They also draw attention to the implications of these insights for curriculum design – an activity usually undertaken by academics in higher education. The authors argue that in preparing for the roll-out of new ACET programmes, higher education is faced with a curriculum moment that ought not to marginalise the voices of adult educators and adult learners when decisions are made about 'valuable knowledge' that should be included in the curriculum.

In the second article situated in the field of adult educators in community education and training, Land takes a closer look at the work contexts of the state-employed corps of adult educators and the parlous conditions that most of them have to contend with in poorly resourced institutions. Through a study conducted at a sample of adult education centres across the nine provinces of South Africa, a big picture of the cadre of adult educators is constructed. Despite policy intentions to increase provision in this education sector, the numbers of adult educators are shown to be declining steadily, which begs the question as to where the educator capacity will be found when the numbers of adult learners being encouraged to enrol at the new Community Education and Training Colleges (CETC) are increased. Nonetheless, Land reports that even under trying circumstances the remaining adult educators displayed a positive commitment to community development and a strong common identity as a mutually supportive group of adult education practitioners.

In the vocational and work-related sphere, Paterson, Herholdt, Keevy and Akoobhai adopt an interesting angle on the meaning of employability skills in their study that introduces 'work-based values' to young people entering workplaces for the first time. In a specially designed programme, TVET college students were enabled to reflect on attitudes and behaviours in the workplace, namely, respect, accountability, self-improvement and perseverance. After learning about and reflecting on these attributes, the students were afforded a period of work placement in which they were asked to reflect on the values conveyed in the workplace through their own and colleagues' behaviours. The focus of the study described in this article was on the assessment instrument piloted in South Africa and in Kenya, and the extent to which it was able to measure changes in participants' understanding of the values and their meanings to employees in practice. The researchers display a careful and rigorous approach

in generating an assessment instrument for such elusive concepts as work-based values. They acknowledge, however, that the instrument now needs to undergo further application in larger-scale studies, but early indications are that it shows great potential.

The question of TVET lecturers and curricula keeping abreast of the rapid advances in technology in the light of the Fourth Industrial Revolution (4IR) is raised by Teis and Els. In a large-scale study in which more than 500 technical engineering lecturers across TVET colleges in South Africa were asked about their awareness of current knowledge of technology and their pedagogical practices in engineering programmes, the authors produced some disturbing findings. Moving from the assumption that changes in the technology environment should drive curriculum review so that students are appropriately prepared for the world of work in technical engineering, they also ask how advancements in the world of technology outside the classroom might influence future technical training. Their findings reveal that just over half of the lecturers surveyed were not aware of the changes in their field and consequently could not comment on how technology curricula might be affected (or adapted) as a result. These findings should raise warning signals among TVET authorities about the lack of continuing professional development for TVET lecturers and the paucity of their exposure to work environments that serve to sensitise them to crucial changes in industry – an awareness that can only be to the benefit of technical engineering graduates.

Regarding research methodologies, this issue attracted three 'perceptions studies'. At their most basic, perceptions studies attempt to help us understand the world through the observations of participants. In the case of Mukeredzi's study, the writer attempted to gather from prison educators their perceptions of what motivates prisoners to engage in adult education and training. The author explains that since it was not possible to gather these perceptions on prisoner motivations from inmates themselves, the study sought to investigate, through the eyes of the educators, what prisoners were hoping to achieve through education. The deliberate choice made by prison inmates to pursue training, as reported by education officials, indicated their future-focused desire for self-improvement and to avoid a return to incarceration.

In the second perceptions study, set in Ghanaian higher education, Owusu-Agyeman and Fourie-Malherbe explore among adult learners in telecommunications and electrical engineering programmes what these adult learners believe enhances their vocational knowledge and skills at their institutions. It should come as no surprise that the learners feel they would benefit from having advanced technology applied in their courses, in both practice-based experiences and work-related knowledge being imparted. Ample empirical evidence exists in the literature regarding the value of relevant resources and appropriate pedagogical approaches in vocational settings; however, the authors considered it important to reinforce that evidence through the contextualised impressions of the adult learners themselves.

A third perceptions study, by Sibiya, Nyembezi and Bogopa, investigates the ways in which TVET engineering students perceive their qualifications and employment prospects in the

light of the high rate of youth unemployment, especially among TVET graduates, in South Africa. These young graduates grasped fully that their engineering qualification was no guarantee of employment, not because the qualification has no value, or as a result of inadequate training, but owing to the lack of jobs in a sluggish South African economy. Nonetheless, they maintained hope in their electrical engineering qualification as they believed the country needs their technical skills, given recent crises initiated by electricity deficiencies. The recommendations made by these young graduates about, among other things, voluntary service being made available in the public and private sectors and funding for small, medium and micro enterprises (SMMEs) were insightful outcomes of the research. In addition, they are sharply critical of the insistence on the part of prospective employers that young people must have experience prior to being employed – a barrier perceived to be nonsensical by young graduates eager to put their newfound skills into practice and obtain such experience through their first jobs.

Finally in this issue, there is an article by Mutambisi, Madondo, Mavesera and Dube that highlights concern about gender sensitivity mainstreaming in the curricula and practices of an agricultural training college in Zimbabwe. Agricultural training there had historically been undertaken mainly by males, but in the rural setting of the study equal numbers of male and female students were enrolled at the college. The study sought to determine whether the curricula in any way reflected a sensitivity towards gender in the pedagogies employed and the attitudes expressed. Based on the data gathered from a range of respondents – both students and lecturers – an analysis of policy and curriculum documents, and classroom observations, the authors conclude that in practice the agricultural training programme materials and activities reveal that scant attention is being given to considerations of gender mainstreaming, or even to silences on the matter, despite stated commitments to the contrary in national policies.

As stated earlier, with our country still in the throes of a pandemic, this issue of JOVACET placed authors, reviewers and our editorial board members under tremendous pressure. We are also aware of the many other authors who were keen to submit articles but who informed us that they regrettably had to withdraw their contributions owing to the stresses of work, family and so on. Our hope is that we will continue to attract both established and emerging scholars from South Africa and internationally to publish high-quality research that contributes to our understanding of the issues relevant to vocational, adult and continuing education and training, but which also pushes theoretical and methodological boundaries. We look forward to your continued support in building JOVACET as a vehicle for disseminating your research endeavours, and wish you well as you continue on your research pathways. Congratulations and sincere thanks to all our contributors featured in this issue!

A 'curriculum moment' for Adult and Community Education and Training: Acknowledging the voices and experiential knowledge of lecturers and students at community learning sites

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ABSTRACT

Curriculum reform and development is, first and foremost, a political project. It involves the selection, organisation and distribution of particular knowledge structures. But factors such as student and teacher demographics deeply influence the ways in which curricula can be implemented, enacted and used as a catalyst for change. In South Africa, a particular 'curriculum moment' has emerged in the field of Adult and Community Education and Training (ACET) through the establishment of community colleges, along with the introduction of new educator qualifications for ACET. In this article, we draw on the reflective diary entries of student lecturers on an Advanced Diploma for Educators of Adults (ADEA) course who are lecturers at community learning sites, to reflect on this moment of curriculum construction in the development of a new Diploma in Adult and Community Education and Training (DipACET). The analysis shows that while curriculum reform is crucial to professionalising the field, it will have a very limited impact if the voices of the lecturers and students at community learning sites are marginalised in the process. These lecturers have experiential knowledge which sets them apart as crucial drivers of the curriculum. Moreover, they select and organise the content to be taught, determine how it is to be taught, and decide on the kinds of knowledge that should be privileged at sites where the curriculum is implemented. We also delineate what counts as valuable knowledge and for whom it is valuable in the field of adult and community education.

KEYWORDS
Curriculum reform and development, knowledge structures, community college, community learning sites, Adult and Community Education and Training

Introduction

Curriculum reform and development is, first and foremost, a political project. It primarily involves the selection, organisation and distribution of particular knowledge structures (Hoadley, 2011). Furthermore, factors such as student and teacher demographics deeply influence the ways in which curricula can be implemented and, inevitably, the way they can be used as a catalyst for change. In South Africa, a particular 'curriculum moment' has arisen in the field of Adult and Community Education and Training (ACET) through the establishment of community colleges. The White Paper on Post-School Education and Training (DHET, 2013) commits the Department of Higher Education and Training (DHET) to creating and offering a diverse range of education and training opportunities through enlarging the current public provision of ACET at adult learning sites attached to provincial community colleges (these were formerly known as Public Adult Learning Centres (PALC)). Among these new opportunities are both non-formal and formal programmes and occupational programmes for adult learners in the communities the colleges serve.

However, achieving this goal is contingent upon ensuring an increase in the number of educators and trainers in the system who are appropriately qualified. As a first step towards responding to the quantity and quality challenges of educators in the system, the DHET published a Policy on Minimum Requirements for Programmes Leading to Qualifications for Educators and Lecturers in ACET (DHET, 2015) with the aim of professionalising the field. Following the publication of this policy, higher education institutions were invited to design programmes that would lead to various designated qualifications. It is in this way that the curriculum moment referred to previously has emerged – the first of its kind. As lecturers at a local university with a long tradition of adult educator provision, we were tasked to develop the institutional content for the new Diploma in Adult and Community Education and Training (DipACET). At the time of developing the DipACET, we were also teaching the Advanced Diploma for Educators of Adults (ADEA).

In this article, we reflect on the significant moment of curriculum development and reform in ACET in two ways. First, we situate the development of the DipACET in the broader field of adult education and training in South Africa by providing a historical overview of adult education and training in South Africa, and by describing the process of developing the DipACET. This is important at the current moment as it is the first attempt by the DHET to professionalise adult and community education through curriculum reform; previously adult and community educator and trainer qualifications were not recognised by the DHET for employment purposes. Second, we provide an educator perspective of teaching and learning in the current community colleges to highlight the important role of educators in the construction of curricula. An analysis of the diaries of 33 student lecturers at a community learning site who were enrolled in our institution's ADEA, forms the basis of this educator perspective.

At the time of their enrolment, these lecturers in training were all teaching at different community learning sites across the Western Cape and, for this reason, could provide a good representation of the present state of teaching and learning at and across the sites. While our purpose in asking students registered for the ADEA to keep reflective diaries was never to interrogate what the present state of teaching and learning at these sites was, these reflections emerged unsolicited. The reflective nature of their training programme and their positionality as students as well as adult educators allowed for this.

Ethics and definitions

Before proceeding, a word on ethics and definitions is appropriate. This article was written after the student lecturers whose reflective diaries we used had completed the ADEA. We received permission from the students to use their learning diary entries in this study on the understanding that their identities would remain confidential and that, by using the entries, no harm would be caused to themselves or to the community learning sites in which they work or the communities in which they live. Furthermore, since the learning diaries were submitted in electronic format, they are stored in a Google Drive file to which only the researchers have access.

To differentiate between the two types of 'student' in this article, we refer to the former ADEA students who are lecturers at the community learning sites as 'student lecturers' and the adult learners who are enrolled at the sites as 'students'. Furthermore, the term 'educator' is used interchangeably at times to refer to teachers/lecturers generally.

Curriculum responsiveness in post-school education and training

In a report which analysed the responsiveness of curricula in post-school education and training to graduate employability, Wedekind and Mutereke (2016) found that five significant factors affect the manner in which a curriculum enables employability. Simply stated, employability refers to the ability to find work or to grow in a current employment opportunity. Five factors identified as drivers of the curriculum were stated as follows: policy, student needs, societal and environmental concerns, employers, and education and training organisations (Wedekind & Mutereke, 2016). In this article, we refer to these five curriculum 'drivers' and added a sixth driver, namely, educators, to help us to understand and articulate the current curriculum moment in ACET.

We also use these curriculum drivers to construct our article. The influence of 'policy' can be seen throughout the first part of our article in the contextual background and as we describe the development of the new DipACET. After that, the context of the community learning sites as the institutional sites of teaching and learning is provided, which describes the influence of the 'education and training organisations' in curriculum development and implementation. In this section, both 'student needs' and 'societal and environmental concerns' are delineated. We use the voices of 33 community college student lecturers who

teach at different satellite sites to provide an understanding of this context. Finally, we conclude the article by discussing the ultimate purposes of adult education and training for adult learners. In doing so, we take into consideration the employability of adult students who complete their studies through community colleges (essentially the curriculum-driver 'employers') and in the broader South African economy. In support of our concluding remarks, and in addition to the five curriculum drivers provided by Wedekind and Mutereke (2016), we show that student lecturers or educators and trainers at community learning sites are crucial drivers of curriculum reform and implementation in post-school education.

Contextual background

The White Paper for Post-School Education and Training recognises that the capacity development function of the post-school education and training (PSET) system is pivotal in ensuring that PSET contributes to the building of a 'vibrant democracy' and a 'flourishing economy' (DHET, 2013:4). As an integral component of PSET, ACET is viewed as having a critical role to play in the DHET's provision of 'quality learning opportunities for out-of-school youth and adults' (2015:10). These policy intentions are inconsistent with the ways in which ACET has been viewed and practised in the formal education and training system. A review of this history indicates that adult and community education has been neglected or marginalised, especially when it involved African adults (Baatjes & Baatjes, 2006; Aitchison, 2003).

Back in 1921–1922, the Communist Party of South Africa (CPSA), in accordance with its stated intention to develop African political leadership, offered night schools to African adults on the Witwatersrand (Bird, 1984). While these schools taught reading, writing and arithmetic skills, the CPSA activists ensured that their students also developed the political and economic insight that would enable them to understand the issues affecting the lives of workers (Bird, 1984:196). But the CPSA educators had limited teaching expertise, which, according to Bird (1984:196), 'improved as they went along'. Furthermore, the CPSA night schools lacked physical resources and the police used the pass laws to harass its students.

The already limited education and training opportunities that remained available for African students became even more restricted with the introduction of apartheid in 1948. All night schools catering for these students, whether run by the CPSA or by missionaries, were forced to close in the wake of the systematic introduction of laws that criminalised the teaching of African students in unregistered schools between 1948 and the early 1960s (Aitchison, 2003).

Therefore, while the 1960s are recognised as a very low point for adult and community education in South Africa for African adults, the introduction in the 1970s of the work and theories of Freire (1921–1997) served to rejuvenate the potential of adult education for political liberation. Walters and Watters (2000:52) concur with this view by highlighting the fact that Freire 'strongly influenced educators and activists linked to the liberation movements'. Freire (1970) criticised traditional schooling as a form of oppression and advocated education

as a means to liberation. It was therefore no surprise that, under the guidance of Freire's work, political 'conscientisation' became a primary strategy for counter-hegemonic political activism in the latter part of the 1970s and into the 1980s. Indeed, Aitchison (2003:139) maintains:

> Paulo Freire became an important weapon in anti-apartheid mobilisation and influenced the short-lived 'People's Education' movement of the mid-eighties. Educational institutions became the training grounds for, and actual sites of, political resistance to apartheid alongside the growing power of independent unions in factories and mines.

Up to this point, no systematic attention had been given to the formal training of adult educators and trainers. The University of Cape Town (UCT) became the first tertiary educational institution to offer an Advanced Diploma for Educators of Adults in 1980, followed by the former University of Natal with its Advanced Diploma in Adult Education (Aitchison, 2003). For its part, the Centre for Adult and Continuing Education at the University of the Western Cape (UWC), established in 1985, introduced a non-accredited Certificate for Adult Educators in 1988. These educator programmes were all developed independently by the institutions offering the qualifications. However, the qualifications were not recognised for remuneration purposes in the national formal education and training system. Having said that, though, individual universities were able to negotiate regional agreements for the recognition of a specific adult education qualification for remuneration purposes with specific provincial departments of education. The establishment of a new suite of nationally recognised qualifications for educators of adults was therefore an important systemic step forward.

The DipACET curriculum development process: An overview

Through its Policy on the Minimum Requirements for Programmes Leading to Qualifications for Educators and Lecturers in ACET, the DHET (2015:34) declared that students could not be admitted to the historically approved AET and CET qualifications beyond 2017. Instead, it advised tertiary institutions to develop and offer new programmes and qualifications for adult and community educators and trainers by 2018, which had to be consistent with the DHET's 2015 policy requirements. The DHET invited universities to indicate which ACET qualification(s) they preferred to deliver beyond 2017, an invitation that received positive responses from a number of universities. These universities then formed a consortium to develop collaboratively the curriculum framework for the new ACET programme.

The collaborative development of the curriculum framework was not exclusively a technical issue of sharing subject knowledge and expertise. Rather, it also ensured that sufficient political legitimacy and acceptance would be obtained for the curriculum from those who were perceived to be knowledgeable in the field. This was viewed as necessary since decisions regarding the development of curricula are often subject to contestation. The process is

simultaneously concerned with both political and educational matters because curriculum knowledge

> inevitably reflects … assumptions about the distribution of individual capacities and the kind of culture to which [curriculum developers] want … people to have access (Young, 1999:464).

Accordingly, collaboration implied that decisions related to curriculum content, knowledge, learning outcomes and methodologies were reached through negotiation and consensus. Furthermore, it could be assumed that the process would not be constrained by external influence or pressure. However, Young (1999) advises that a qualification purporting to professionalise inevitably includes 'official knowledge' (Apple, 1998:5), which is recognised by its special status as being uniquely codified and expected to be learned 'according to particular rules' (Young, 1999:464).

The aim of professionalising the field of ACET was part of a political mandate to improve the delivery of adult education in order to enhance adult students' access and success. To date, these students have had limited opportunities and largely remain among the poorest of the poor (Groener, 2019). Therefore, creating new educator programmes through curriculum reform and development could be viewed as instrumental towards helping the DHET to achieve its aims.

We turn briefly now to the development of the DipACET, primarily to demonstrate the policy moment in the development of a new ACET curriculum.

DipACET curriculum development process

Policy prescripts

The Policy on Minimum Requirements for Programmes Leading to Qualifications for Educators and Lecturers in Adult and Community Education and Training requires the DipACET curriculum framework development to meet specific policy prescripts. It states that the policy

> provide[s] a basis for the construction of core curricula for programmes leading to initial professional and post-professional qualifications for AET educators and CET lecturers (DHET, 2015:8).

This qualification is a 360-credit NQF Level 6 initial professional qualification (DHET, 2015:18). It recognises graduates as 'professionally competent educators and lecturers' with the necessary capabilities to teach in ACET settings. In addition to fixing the entry requirements for access, the policy prescribes, in great detail, the knowledge mix for programmes leading to the DipACET (see DHET 2015:19–20). Suffice to mention that the minimum requirements with which programmes need to comply include (DHET, 2015):

- stipulated credits for fundamental, disciplinary, pedagogical, situational and practical learning;
- the level as well as minimum credits for the development of ACET teaching specialisation;
- the assessment of fundamental learning credits at Level 5, which will not exceed 72 credits; and
- workplace-based learning and assessment as an integral part of the work-integrated component of the qualification.

Institutional processes

Together with meeting the necessary policy prescripts, curriculum developers at an institutional level were required to consult with local organisations' representatives and other interested role-players in the ACET community to ascertain the needs of the communities in which the qualification will be offered and contextualise the programme appropriately. It was this curriculum moment that prompted a consideration of educator voices as an additional driver of curriculum decisions in the design of a new programme.

Moreover, institutions also had to adhere to the standards and nature of the curriculum development process at a university that hosted the qualification. This would ensure the sanctity of 'official knowledge' for the curriculum and stipulate the rules by which the curriculum should be governed (Young, 1999:464).

Since policy is a key factor that drives the curriculum development process (Wedekind & Mutereke, 2016), the next section provides a lens to show exactly how policy influences curriculum decisions. And because educators that implement curricula are another driver of curriculum construction, we now consider their voices too.

Community learning sites of teaching and learning

In a module of the ADEA, a legacy qualification being delivered at the time, our student lecturers were asked to keep reflective diaries on issues related to adult teaching and learning at community learning sites, as a key component of the course. For the purpose of our study we analysed the reflective diaries, in terms of the present state of teaching and learning at community learning sites according to five factors:

- environmental and social factors;
- educators at community learning sites;
- curriculum delivery;
- student needs; and
- resources needed for effective teaching and learning.

Environmental and social factors

The community learning sites, previously known as the PALCs, are all located in very poor communities across the Western Cape province of South Africa. These communities are affected by high rates of crime and unemployment, and a large number of high-school student drop-outs owing to pregnancy, drugs or 'getting lost in the system' (see Baatjes & Baatjes, 2006; DHET, 2013). Currently, community learning sites attract mostly youths who have dropped out of school and are attending the learning site in the hope of receiving a 'second chance'. Learning at the sites is focused primarily on academic knowledge because all the learning areas lead to the national matriculation certificate. However, one student lecturer reported in her diary that at her centre [site], currently, there was an established 'partnership with the … municipality to help students with skills training'. Student lecturers indicated that the sites at which they worked are also affected by certain factors that impact on their day-to-day teaching and learning activities. These include gang violence, crime, alcohol and drug abuse, and vandalism. People here, disadvantaged by apartheid, continue to experience poverty, a lack of resources, limited opportunities for employment and access to higher education, poor-quality housing and inadequate access to a clean environment (Kehler, 2001; DHET, 2013).

Student lecturers at community learning sites

Student lecturers at adult and community learning sites are between 25 and 55 years of age. These student lecturers have, on average, between five and 25 years' experience as teachers of adults. They are predominantly underqualified: many of them acquired their current level of education through the community learning site itself, starting out as general workers. They decided to return to school and completed their studies towards a senior certificate through the community college. That eventually led to their being appointed to teach adult learners. The majority of these educators have formal qualifications which include either a National Diploma in ABET Practice or a National Certificate in Worker Facilitation. Whereas approximately 15% of them have formal teaching qualifications, the remainder lack formal training in teaching adults. But they have engaged in many post-school formal and non-formal learning programmes and, as a result, have gained rich insights into adult education and training practices through their participation. Despite some educators not having had formal training in the teaching of adults, they have learnt experientially while they participated as educators of adults over many years. The non-formal learning programmes mentioned earlier are associated with the operational procedures and methodologies of teaching and assessing adult learning, subject enrichment and developing counselling and/or pastoral skills.

A common factor among most of the student lecturers who participated in the ADEA course is that they either grew up in or currently reside in the same communities as their teaching

site and those of their students. They also face similar challenges to those of their students. As one student lecturer wrote:

> In our community, we have a lot of young children who walk around without education. They leave school at a young age and become involved in gangsterism. These factors lead to gender-based violence and our community has a high crime rate. Our children who finish matriculation walk around because their parents do not have money to pay for them to go to [a] university. I [really] can relate to some of these factors because my parents also didn't have money to send me to [a] university (IPSS, 2020, np).

By relating the economic and social realities of her lived experience, this student lecturer confirms the scholarly findings which describe similar poor and marginalised communities (Kehler, 2001; DHET, 2013).

Some student lecturers noted that residing in the same communities as their students has both positive and negative effects. Whereas the student lecturers understand the home circumstances and nature of their students very well, many of them experience the challenge of being treated with disrespect by students. In addition, some students are unable to relate to student lecturers as legitimate educators because of their diverse extracurricular relationships in their community settings.

Curriculum delivery

Many student lecturers' diaries reflect dissatisfaction with the curriculum in use at community learning sites and with the assessment practices employed. The student lecturers indicate that the curricula being taught at the sites – which reflect the basic school curriculum with subjects such as Mathematics, Mathematical Literacy, Life Orientation and Ancillary Health – are not relevant to the particular needs of the students wanting to find employment. While older students desire to further their education and therefore desire to work, the student lecturers noted that younger students, in general, have no such desire and use the college as a space to socialise with their peers. In describing the desire of younger students as a form of resistance to schooling opportunities, these student lecturers describe a hegemonic perspective of marginalised youth living in conditions of adversity. Such students, according to Bottrell (2007:600), are 'likely to be identified within at-risk discourses'. But youth resistance is often a 'calculus based in normative predictions and causal claims that link individuals, poverty, social problems and delinquency'. One student lecturer noted that an irrelevant curriculum is a big concern for her, especially because the students' employability will determine their 'route out of poverty' (Groener, 2019). Other student lecturers' diaries maintained that the current curriculum cannot be delivered effectively because of a lack of resources, a lack of teaching and learning materials and a lack of human capacity.

Student needs

The ages of students at the community learning sites range from 16 to 60 years, and the students have a wide range of experience and personalities. Younger students bring with them the challenging issue of a lack of discipline. More mature adults bring a sense of purpose and calmness to the learning site. Whereas most students aim to complete their matriculation qualification, as mentioned above, a significant number of them participate in the classes to gain skills for employment and financial sustainability. Since the current curriculum at community learning sites focuses on academic knowledge, younger students lose interest as they prefer to gain work-related skills. A few student lecturers' diaries noted that if the curriculum were made more relevant to supporting students' employability, there would be more interest to register at the site.

Resources needed for effective teaching and learning

Even though the national policy advocates the provision of quality ACET, limited resources at the site make this objective difficult to achieve. A typical learning site is described by one student lecturer:

> Our centre [site] doesn't have a building [itself]. We rent a classroom at … Primary School … Our centre [site] is split into satellites to accommodate all students from [the area] to register for classes and to complete their studies.

Another student lecturer indicated that the physical environment in which the site is situated is 'not always very safe'. In addition, the site has insufficient capacity to offer a range of subjects per year as 'there [are] no other [educators] available to teach' additional subjects. Owing to the lack of teaching and learning materials, many students do not complete their assignments. They are unable to do research at the sites because there is no library and they do not have access to computers. Since the textbooks are provided in English only, student lecturers have to translate some of the content for the students, which takes a lot of time and effort. These factors impact on the effectiveness with which the curriculum is implemented.

The factors mentioned above are brief descriptions of the current contexts of community learning sites. Despite their brevity, what appears to be evident is that adult students are mostly attracted to the site not for academic purposes but for employability. It is also evident that student lecturers at community learning sites are fundamental to the effective delivery and implementation of the curriculum. As we move into the next section, we take our discussion back to the significance of this curriculum moment in which these educator voices are instructive.

Discussion

A key theoretical perspective in curriculum studies is that the selection and organisation of knowledge lie at the heart of curriculum theory and development (Gamble, 2016). As we have shown thus far, developing a new curriculum for educators and trainers of adults involves decisions about what knowledge to include or exclude and whose voices to consider in the process of curriculum construction. The voices of our student lecturers suggest that they have essential insights into curriculum content.

The development process should therefore guard against university-based adult education academics becoming the primary and sole validators of curriculum knowledge by virtue of their institutional authority and power. Such a stance could be viewed as dominating the process of curriculum construction, which contradicts the accepted principle in the field of adult education which advocates that participants should strive to 'take control of their lives' (Brookfield, 2001:2).

We propose that student lecturers at community learning sites should be included as drivers of curriculum development, as they are the primary influencers of the enacted curriculum at a grassroots level. In effect, it is they who influence the content of what is taught, how it is taught, and what kind of knowledge is privileged in curricula they are implementing. It is for these reasons that their qualifications matter because they require both competence and confidence when making decisions regarding curriculum implementation.

Hoadley (2011) argues that, whereas knowledge is important in curriculum theory and development, so is the knower:

> If any act of curriculum construction is to decide what knowledge is of most worth to its citizens, then a consideration of knowledge and knowers is crucial. And the structuring of a curriculum in relation to what students can and should do at what point (selection and sequence) entails a theory of knowing (Hoadley, 2011:156).

In terms of this perspective, the process of knowing as a result of curriculum implementation is directly related to the relationship that exists between the learner and the knowledge they obtain through the curriculum, a relationship influenced by various factors.

An additional matter raised by the student lecturers' diaries, which is worthy of further exploration, in relation to educator and training qualifications is the question of years of experience – the years of experience of practising educators and trainers of adults. We contend that problematising experience would be a worthwhile exercise because of its potential value in contributing to the certification of adult educators. While we recognise that experience is highly valued in adult education, there is disagreement about theorising the relationship between experience, learning and knowledge. Some scholars privilege experience as the

source from which knowledge is extracted by means of systematic reflection on the experience (Kolb, 1984; Butterworth, 1992; Challis, 1993). Conversely, radical adult education scholars theorise experience, learning and knowledge as intertwined and inseparable (Johnson & Usher, 1996; Michelson 1996; Stuart 1996). They maintain that experience is knowledge because experience, learning and knowledge are bound together (Johnson & Usher, 1996:7).

In taking the latter view, we argue that a new ACET curriculum needs to grapple with the claims that current lecturers at community learning sites have significant teaching experience – in fact, between five and 25 years of experience in teaching adults (as indicated earlier). If experience, learning and knowledge are inseparable, what does this mean for the qualification of a student lecturer? The Policy on Minimum Requirements for Programmes Leading to Qualifications for Educators and Lecturers in Adult and Community Education and Training (DHET, 2015) recognises that educators and lecturers in the system have gained knowledge as a result of their working experiences, and thus have 'relevant prior learning that is already in place' after the process of assessment (DHET, 2015:17).

Our analysis of the process of developing a curriculum for an ACET qualification leads us to argue that institutional stakeholders privilege what Murphy and Fleming (200:87) refer to as 'college knowledge', that is, academic or theoretically based knowledge. As has been indicated above, an analysis of the student lecturers' diaries shows us the value of 'common knowledge', since it is this type of knowledge that could lead to students' skills development and employability in their community settings.

Classification of knowledge structures differentiates between context-dependent (mundane) and context-independent (esoteric) knowledge. Context-dependent knowledge

> can be practical – like knowing how to repair a mechanical or electric fault or how to find a route on a map. It can also be procedural, like a handbook or a set of regulations for health and safety (Young & Muller, 2016:111).

In contrast, context-independent knowledge 'is developed to provide generalizations and makes claims to universality; it provides a basis for making judgements' (Young & Muller, 2016:111).

Wheelahan (2007:639) argues that context-dependent or mundane knowledge

> is tied to specific contexts and events, so that the meaning of mundane knowledge is only understandable within that specific context and the material base it rests upon.

Furthermore, context-independent or esoteric knowledge is powerful knowledge. This type of knowledge 'constitutes the site of the "unthinkable" and the "yet-to-be-thought"':

> Esoteric knowledge has the potential to challenge the social distribution of power, because of its … capacity to transform knowledge and how that knowledge is used (Wheelahan, 2007:639).

Given the current context of curriculum development in South Africa, the question of knowledge and its associated structures remains central and contested. Since knowledge is not prescribed in the current ACET curriculum, the curriculum development process is obliged to reflect on how the social context in which adult education and training is offered, will affect curriculum implementation at the level of teaching, learning and knowledge selection. We therefore suggest that the developers of ACET curricula should theorise how adult students and lecturers at community learning sites gain access to powerful knowledge.

Concluding remarks

This article confirms that the current officially underqualified student lecturers at community learning sites have years of experience in teaching adult students. This raises the compelling issue of the value of experience in obtaining an ACET qualification. It is well known that experiential learning has a special value in adult education practices. However, in relation to the new qualification for adult and community educators and trainers, it will be necessary to clarify the relationship between experience, learning and knowledge. Because the way in which this relationship is conceptualised might be a form of acknowledging the teaching and situated experiences of lecturers currently in the system, the Policy on Minimum Requirements for Programmes Leading to Qualifications for Educators and Lecturers in Adult and Community Education and Training (DHET, 2015) does make provision for the accreditation of experiential learning. However, the question remains: Which knowledge derived from experience will be sanctioned?

The voices of educators at community learning sites suggest that adult students participate in learning with the intention of gaining access to employment skills and knowledge that help them to improve their chances of obtaining sustainable livelihoods. By including community adult educators as an additional driver of curriculum construction, we can ensure that powerful contextual and experiential knowledge of adult teaching and learning is not ignored.

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South Africa's adult educators in the community college sector: Who they are and how they view their training, their work and their position

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ABSTRACT

This article examines the work context of South Africa's state-employed adult educators. It is based largely on a recent cross-sectional study of adult educators commissioned by the Department of Higher Education and Training (DHET), which draws on the DHET's database of adult educators and qualitative information gained from visits to adult education and training centres in all nine provinces. The study enquired into adult educators' working lives, their qualifications, their sense of whether their training was adequate, the issue of further training, their understanding of their work, their conditions of service and the support they believe they need. The study showed that the number of adult educators employed by the DHET is declining steadily and that the working conditions of adult educators are uneven: a few work in fairly well-resourced urban centres, but many work in poor conditions, with little support. Nevertheless, the study indicated that almost all the adult educators view their role in a positive light. Confident of support from one another, they have a definite shared identity as a social group and express a strong commitment to their learners and the communities in which they work. Overall, they constitute a group with strong, yet poorly tapped, potential to contribute to positive community development.

Introduction

The literature attests to the benefits of adult and community education in spheres that are central to shared daily life (see Neville, O'Dwyer & Power, 2014; Milana, Rasmussen & Holford, 2016; Iñiguez-Berrozpe, Elboj-Saso, Flecha & Marcaletti, 2020). If the status of occupations depended on evidence of their value to society, adult and community educators would be highly regarded and handsomely remunerated. Yet, internationally, adult and community education tend to be underfunded when compared to schooling and tertiary education (Benavot, 2018); adult educators have long perceived their position as the neglected stepchildren in the great education family (Bowl, 2017). The picture is even starker in South Africa.

Background

People regarded as those with the greatest need for adult education and therefore the prime 'clients' for the sector are adults who are not in employment, education or training (NEET). In 2020, about 17 million people in South Africa aged between 15 and 60 (approximately 40% of the total population) were classified as NEET (Khuluvhe & Negogogo, 2021). The COVID-19 lockdown exacerbated the situation, and the proportion of adults who are NEET rose to 43% in the third quarter of 2020 (Stats SA, 2021) as employment opportunities were demolished when the lockdown forced businesses to stall operations, contract or close down.

Partly because of this, and despite universities having more than doubled their intake since 1994 to more than a million students (DHET, 2019a), the number of young adults (aged 15–34) who are NEET rose to 8,8 million in 2020 (Stats SA, 2021). NEET status correlates strongly with poor levels of education (DHET, 2019a). This situation suggests that adult learning should be advanced as a vital catalyst in the transformation of the lives of disadvantaged adults because of the known positive influence of education on employability and income. It also suggests the need to expand the provision of adult education, with increased numbers of adult educators serving this expansion. This is expressed in government policy and should translate into more employment opportunities and more secure employment for adult educators.

In the *National Development Plan for the Implementation of the White Paper for Post-school Education and Training System* 2019–2030 (DHET, 2019b) the objective was that by 2030 there would be a million learners registered in the new Community Education and Training College (CETC) system.[1] To achieve this objective within the 17 years between the drafting

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1   This new Community Education and Training College (CETC) system, presented as part of a strategy to revitalise and expand South Africa's adult and community education system, would employ a large number of adult and community educators. As an early step towards the new system, the old Public Adult Learning Centres (PALCs) were administratively shifted from the provincial education departments to the national Department of Higher Education and Training (DHET)'s Post-School Education and Training (PSET) system and nominally clustered into nine community colleges (one per province) with a plan ultimately to have one in every district.

of the plan and the target date of 2030, it would have been necessary to attract a steadily increasing stream of adult learners into the state system, but this did not happen (Aitchison, 2002; 2003; 2018). A well-funded and successful adult literacy campaign was conducted from 2008 to 2016, but this offered only minimal basic literacy and numeracy that was not capitalised on with recruitment into more formal Adult Basic Education and Training (ABET) (DHET, 2017:387–414).

Since 2015 the number of adults choosing to register in the state adult education system has in fact steadily declined. This decline puts the social and economic goals flagged in adult education policy ever further out of reach and reduces the employment opportunities of adult educators in the system.

Decline in number of learners in adult education system

By the first quarter of 2020, the total number of adult learners registered in the country had declined to 180 468 (DHET, 2021) – a 34% reduction since the high level of 2016.
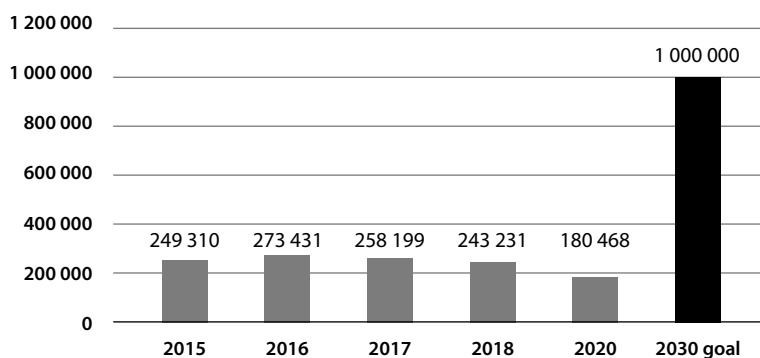
Figure 1:   The current CET learner situation vs the 2030 goal (DHET, 2017 and DHET Webinar, 2021)

Because of the effects of the COVID-19 pandemic and the lockdown, the policy goal of a million learners by 2030 was adjusted downwards in 2021. This overall trend and the slow development of the new community college system, now further held up as a result of the COVID-19 lockdown, does not augur at all well for the prospects of the CETC system and its educators. The question remains whether there is the political will to implement the system described in this policy (DHET, 2013).

State system adult educators – antecedents of their current circumstances and status

In the early 1990s, when a substantial number of adult educators were employed in non-governmental organisations (NGOs), church-based organisations and workplace literacy

programmes in industry, training for adult educators was carried out largely in the organisations they worked for. Operating in a sphere without much regulation, these organisations trained their educators in line with their particular aims, using a wide variety of methods (Harley, Aitchison, Lyster & Land, 1996:435–492). At the more conservative end of the spectrum, the NGO Operation Upgrade offered basic functional literacy in workplace programmes for organisations that employed large numbers of unskilled workers (e.g. timber companies); at the more revolutionary end, Freirean-inspired initiatives offered education for liberation and consciousness-raising. This gave rise to a heterogeneous spread of basic training and certification of adult educators in universities, technikons and training organisations. These qualifications, held by many educators who have worked in the field for decades, appear to be categorised on the NQF as Level 5 'ABET Practitioners Certificates' (Land, Mbhamali & Mukeredzi, 2021). The ABET Institute of the University of South Africa trained more than 80 000 such educators, many of whom were the backbone of the Kha Ri Gude literacy campaign (DHET, 2017).

By the late 1990s, the majority of adult educators were employed in the state sector. Most were qualified school teachers with a few days' training as 'orientation' to adult education behind them (Harley et al., 1996:435–492). Non-state provision of literacy and basic education dwindled with the ending of anti-apartheid donor funding and new directions for funding such as the HIV/Aids pandemic, but its ethos undoubtedly inspired some of the intentions evident in current policy documents and new initiatives.

Current employment status of state adult educators

In 2021, it is difficult to find paid adult educators who are not employed in the state system. After 1994, there was a general demise of what had been, in the 1980s and 1990s, a substantial and busy NGO adult literacy sector (Miller, 2011), and a similar decline in the employment of trainers in industry as under-educated employees completed a basic education or were replaced with younger, better-educated applicants. Since 2015, when they were shifted from the provincial departments of education, adult educators have been directly employed by the DHET along with lecturers at TVET colleges and tertiary institutions; they are now referred to by the DHET as 'lecturers', even though this label is not descriptive of what they have to do as teachers of school-equivalent education for adults.

From the perspective of adult educators, the shift to the DHET has not been a positive one; many of them feel that they are now worse off because, in their perception, they receive even less support than they did from the provincial departments.

Number of adult educators

Data from the DHET's EMIS system supplemented by figures from a DHET publication (2019b) show a decline in the number of adult educators employed by the state, from 15 991 in 2015 to 14 259 in 2016, to 14 014 in 2017 and 12 975 in 2018. In 2021, DHET estimates

suggest that it has risen to 13 607, but this is still 15% fewer than there were in 2015, and fewer than the 14 373 adult educators employed in state-run adult learning sites in South Africa in the 1990s (Harley et al., 1996).
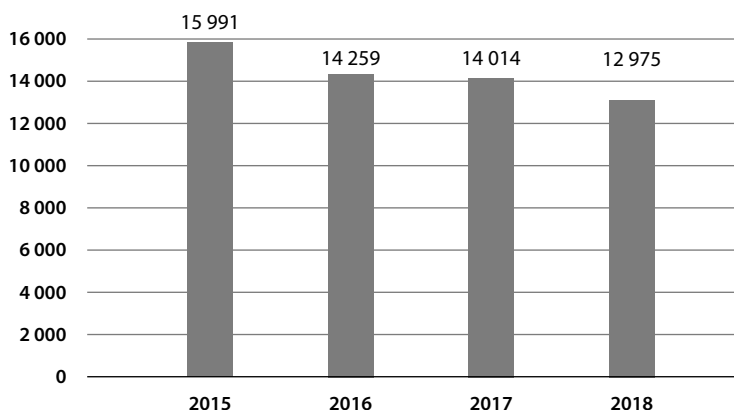
Figure 2: Adult educators in employment in South Africa, 2015–2018 (DHET, 2019b)

In individual provinces, the Eastern Cape, KwaZulu-Natal, Gauteng and the Western Cape suffered a steady decline in the number of adult educators between 2015 and 2018. The Northern Cape and North West provinces bucked the downward trend, with more educators employed in 2017 than in 2015, but their numbers dropped in 2018 after a 2017 peak. In Limpopo, the number of educators employed dipped steadily from 2015 to 2017 and then increased in 2018.

Table 2: Number of educators per province, 2015–2018 (DHET, 2019b)

NUMBER OF EDUCATORS PER PROVINCE		2015	2016	2017	2018
Eastern Cape	(EC)	2 952	2 863	2 788	2 497
Free State	(FS)	523	868	913	862
Gauteng	(GAU)	2 246	2 245	2 097	2 131
KwaZulu-Natal	(KZN)	5 250	4 030	3 717	3 124
Limpopo	(LIM)	1 430	1 122	995	1 295
Mpumalanga	(MPU)	1 862	1 308	1 470	1 297
North West	(NW)	944	1 040	1 244	1 005
Northern Cape	(NC)	56	163	170	161
Western Cape	(WC)	728	620	620	603
National		**15 991**	**14 259**	**14 014**	**12 975**
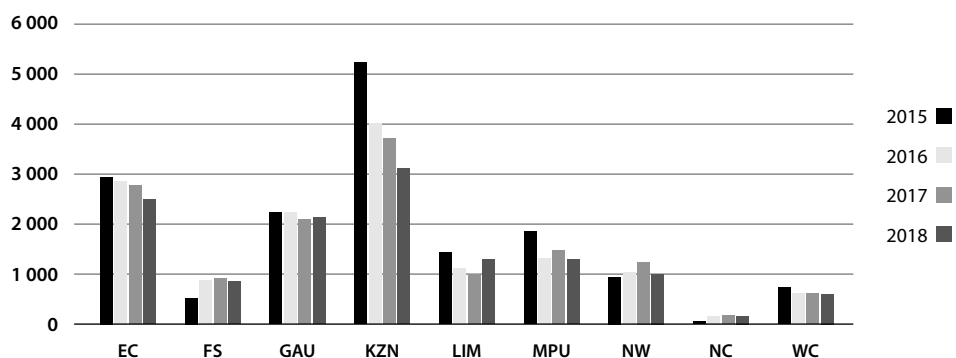
Figure 3: Graphic comparison of adult educators per province, 2015–2018 (DHET, 2019b)

The figures above are based on returns submitted to the DHET's EMIS system by the Community Learning Centres (CLCs) and their satellites. More recent figures are not available. Since not all CLCs submit returns, these numbers are lower than the actual number of educators in the field, but the downward trend is likely to reflect reality. This contraction contrasts sharply with the expansive tone of the White Paper (DHET 2013), DHET's policy on minimum requirements for adult educators (DHET 2015b), the *National Policy on Community Colleges* (DHET 2015a), and the draft National Youth Policy 2020–2030 (Department of Women, Youth, and Persons with Disabilities 2020).

The provinces with the most adult educators are KwaZulu-Natal and Eastern Cape, with 24% and 19% respectively, followed by Gauteng with 16%. Other provinces have between 5% and 10% of adult educators each, except for Northern Cape, which has by far the fewest, with only 1%. Generally, the numbers roughly correlate with the number of adult learners in each province.

Regarding the gender breakdown, a substantial majority (76,5%) of adult educators are women and only 23,5% are men. This is the general pattern for all the provinces, as shown in the graph below.
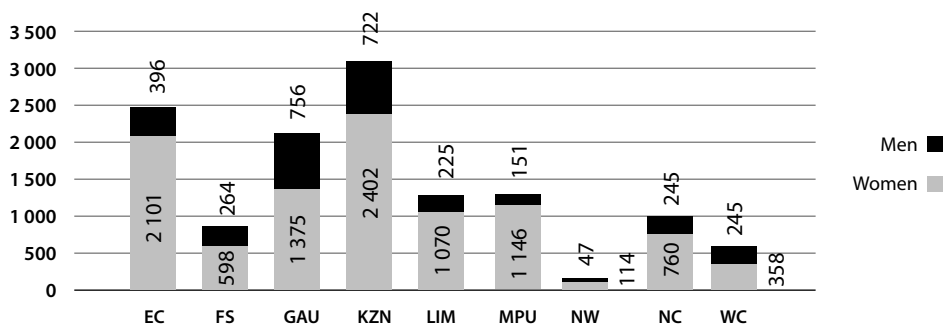
Figure 4: Adult educators by gender per province (DHET, 2019a)

Qualifications of adult educators

The DHET's 2015 policy on the minimum requirements for programmes leading to qualifications for educators and lecturers in adult and community education and training promotes the development of well-qualified professional educators. This policy stresses the need for 'appropriately qualified, versatile, competent AET educators and CET lecturers' (DHET, 2015b:6) and advocates

> articulation pathways that take the range of qualifications of adult educators and CET lecturers into account to ensure that people who hold any of these qualifications have access to an appropriate HEQSF-aligned qualification that will enable their further development (DHET, 2015b:7).

In terms of this policy, only educators who hold qualifications at NQF Level 6 and above are considered to be professionally qualified.

Estimates received from the DHET based on 2020 returns from CETC principals show that on the basis of this policy the currently active teaching corps is severely underqualified, with only 64% regarded as professionally qualified with at least REQV 13, which is basically NQF Level 6 and above (Land et al., 2021).

Regarding NQF levels, verified 2017 data from the DHET's EMIS system showed that 19% of adult educators employed in South Africa held qualifications at NQF Level 4, with no further academic development or any professional training; 16% held only a Grade 12 and 3% held only technical training, such as N4, N5 or N6. A further 20% held an NQF Level 5 qualification, which, in terms of the new policy, is seen as an entry-level qualification and no longer as a professional qualification. Educators with this Level 5 certificate should now be employed as 'associate educators' with inferior conditions of service.
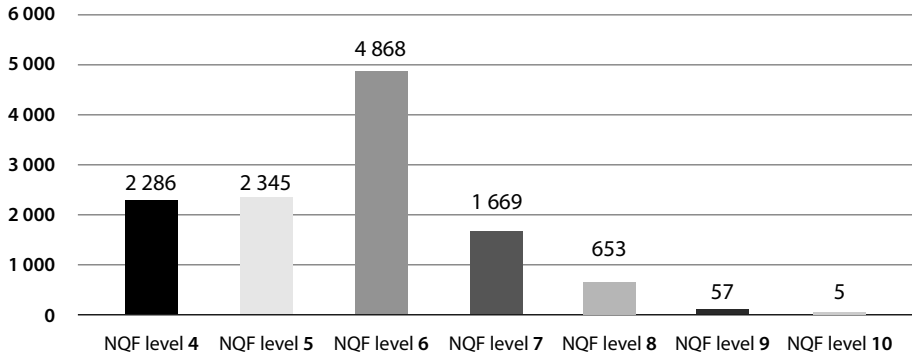
Figure 5: Adult educators' NQF levels, 2017 (DHET, 2017)
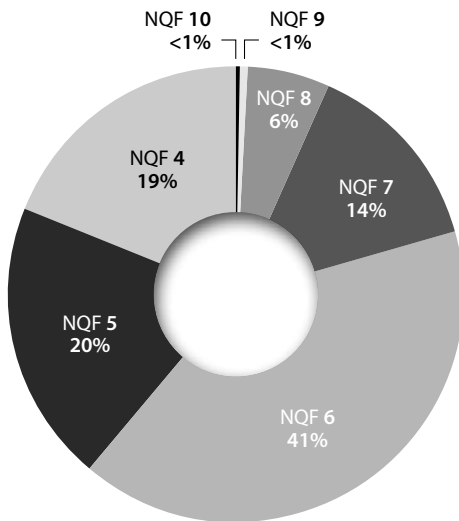
Figure 6: Adult educators by NQF level, 2017 (DHET, 2017)

The spread of qualifications held by adult educators in 2017 and on which these graphs are based ranges from NQF Level 3 to NQF Level 10:
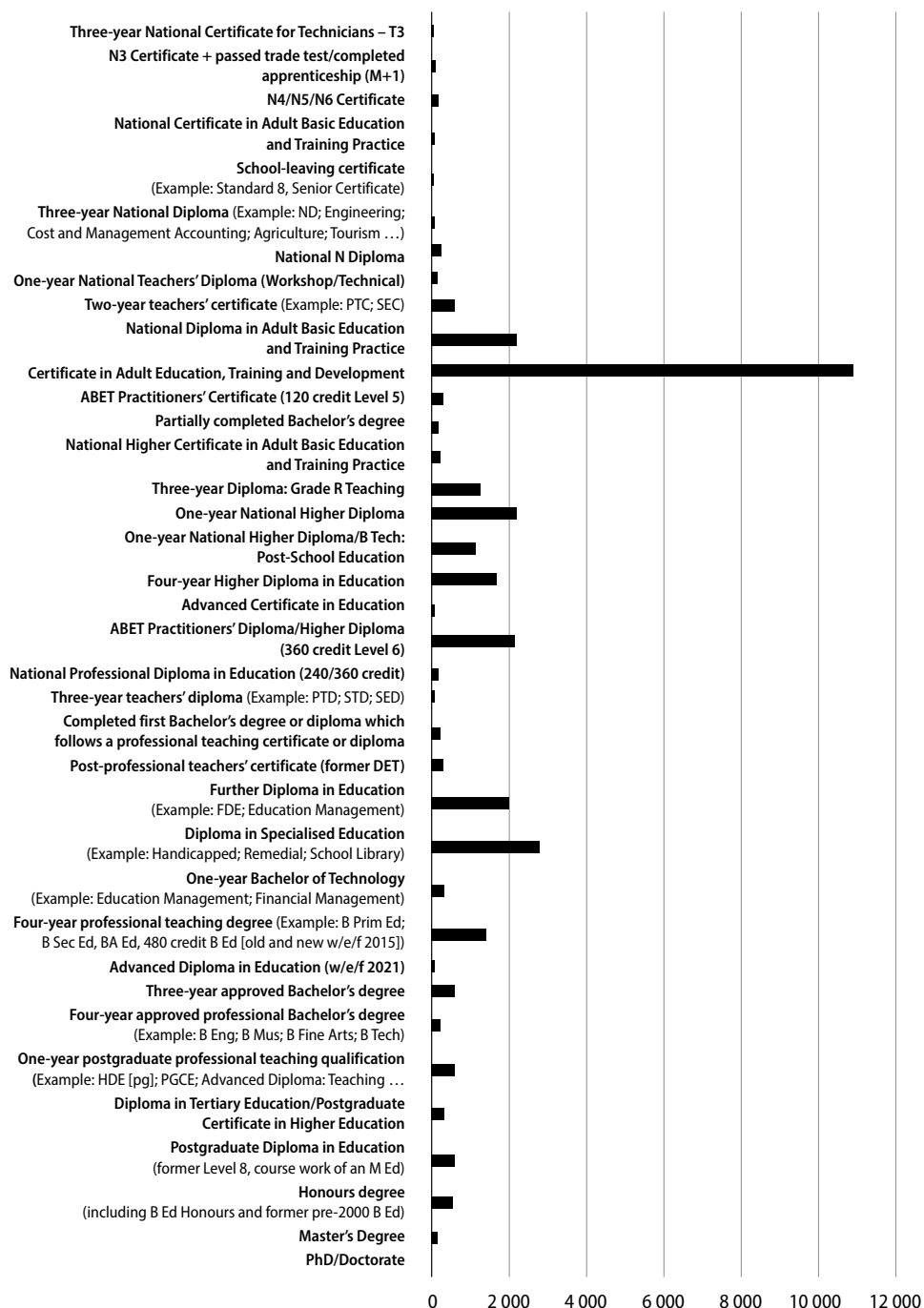
Figure 7: Adult educators' spread of qualifications (DHET, 2017)

As the graph above shows, current adult educators have a wide spread of qualifications, of which the most commonly held by far in 2017 was the NQF Level 5 certificate in ABET teaching. However, it must be remembered that in these returns, educators list all of the qualifications they hold and not only their highest qualifications. An analysis of the highest qualifications listed by adult educators showed that:

*   36% of them had some kind of training in adult education or adult basic education;
*   25% had no training in teaching adults but did hold a qualification for school teaching; and
*   only approximately 20% of them hold a graduate-level diploma, a degree or a post-graduate qualification – although they are keen to improve their qualifications.

Unverified data received from the DHET, based on principals' 2020 returns stating Relative Education Qualification Value (REQV) levels, suggest that whereas 19% of state-employed adult educators are still unqualified, 44% are on REQV 13. This suggests that a significant number may have improved their qualifications from NQF Level 6 to NQF Level 7 since 2017.
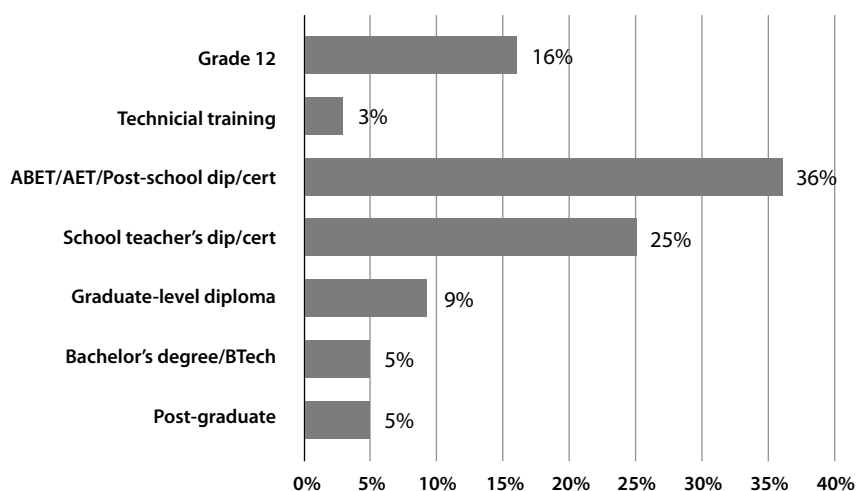
Figure 8: Adult educators by type of qualification (DHET's EMIS system, 2017)

The Auditor-General's (2014) report on the country-wide audit of adult education and training centres conducted in 2011 and 2012 noted the lack of measures to track and report on the extent and effect of underqualified educators. However, the report linked the poor success rates of adult learners to the poor quality of teaching by underqualified educators who struggled to interpret the curriculum and lacked basic teaching skills and strategies. Unfortunately, a large proportion of adult educators are still teaching without the benefit of any training.

A vision for the adult educator

The DHET (2015:10) has set out an elevated vision of what the professionally qualified adult educator should be capable of. Principles that are specifically relevant to the development of AET educators and CET lecturers and their work in ACET institutions and other settings include the following:

- Embracing the concept of lifelong learning, recognising that learning takes place throughout a person's life and in many forms;

- Recognising the specific holistic nature of lifelong learning, which includes the cognitive, emotional and cultural aspects of learning;

- Promoting the values that underpin an open and democratic society based on human dignity, equality and freedom;

- Respecting and encouraging democracy and fostering a culture that promotes human rights;

- Pursuing excellence and promoting the full realisation of the potential of every learner and member of staff, tolerance of ideas and appreciation of diversity;

- Promoting optimal opportunities for adult learning and literacy, for knowledge development and the development of skills in keeping with international standards of academic and technical quality; and

- Recognising ACET as part of continuing education and training in the PSET sector, including the overlaps and articulation of ACET with technical and vocational education and training and higher education and training in the quest to achieve an integrated PSET system.

It is clear from the above description of adult educators' qualifications that this vision is still a mirage. However, a recent initiative that may improve the prospects for those adult educators who are in a position to take advantage of it is the DHET's European Union-funded Teaching and Learning Development Capacity Improvement Programme (TLDCIP). This programme is aimed at enhancing South African universities' capacity to educate and train educators, including adult educators, and has piloted a curriculum for the new NQF Level 7 Advanced Diploma in Adult Education and Training. Different versions of this qualification were offered for the first time at the University of Cape Town (UCT) and the Durban University of Technology (DUT) in 2020.

Cross-sectional study of adult educators and adult education programmes

In this next section, we consider adult educators' own articulation of their work and their social identity as adult educators in South Africa based on the findings of *A cross-sectional study of adult educators and adult education programmes* (Land et al., 2021). The study was commissioned by the DHET as part of its TLDCIP.

During 2018 and 2019 researchers from the DUT's Adult and Community Education unit visited 44 CLCs across the country to interview adult educators working there. In each province, at least one urban and one rural CLC, a CLC in a prison and, where possible, an NGO offering some kind of adult or community learning were visited. This study aimed to inform planning for the provision of training for educators in the post-school sector, particularly in view of the planned expansion of community colleges. Therefore, the study enquired into their working lives, focusing on:

- adult educators' education levels;
- their understanding of their work;
- their sense of whether their training was adequate; and
- the support they need.

At each site, the researcher would interview the centre manager and run a focus-group discussion with educators who were available and willing to participate (making up a sample of approximately 150 adult educators in all). Following this, and provided the research participants were willing, the researcher would photograph the centre. All the sites were visited. By April 2019, all the sites shown below had been visited and data were analysed in terms of the themes noted above:

- KwaZulu-Natal – four CLCs and one NGO
- Eastern Cape – five CLCs
- Free State – five CLCs and one NGO
- Gauteng – five CLCs and one NGO
- Mpumalanga – six CLCs
- Limpopo – three CLCs and one NGO
- North West – three CLCs and one NGO
- Northern Cape – three CLCs and one NGO
- Western Cape – three CLCs and one NGO.

Thematic data analysis showed that, across provinces, educators raised the same issues and made very similar claims. This contradicted our expectations that different provincial contexts would give rise to differences in what adult educators communicated to researchers.

Social identity of adult educators

According to Tajfel's social identity theory (Brown, 2020), self-esteem, a sense of belonging, confidence in potential agency and resilience are all to be gained from identifying with a group of people one sees as similar to oneself. Identity as a member of a social group is based on our categorising people we encounter as being either within or outside the group we identify with. This categorisation provides us with a framework for understanding our social environment, informs our expectations of other people and influences our behaviour since we tend to conform to what we understand to be the norms of the group we identify with. In comparing our 'in-group' with others, we tend to find ways to foreground the perceived strengths of the group (McLeod, 2019). Group identity tends also to be stronger in groups who see themselves as comparatively disadvantaged and disempowered. The data collected indicate that adult educators have a strong sense of identity as a minority group.

Educators across all the provinces are sensitive about the low status they feel they have in relation to school and TVET educators. The vehemence with which adult educators expressed their sense of shared indignation at their perception of low status resonates with the hypothesis in social identity theory (Brown, 2020) that strong association with the group can increase their sense of well-being in the face of the stigmatisation that they perceive. Many believe that the DHET deliberately neglects them, seeing them as simply not worth much attention. Statements from adult educators included:

> We are trying to uplift the community but there is no recognition, even from the Department of Higher Education and Training.

> We felt excluded from the Department [of Higher Education and Training].

> Learners are still waiting for 2017 results. The Department doesn't give a good reason for not giving out the results.

> We have learners with disability and the centre manager reported to the Department, several times and no help yet. They say there are no funds, but these interpreters are needed since this area has a lot of deaf citizens.

Educators in prisons believe that they are tolerated with resentment by the Department of Correctional Services (DCS) since adult learning is not the primary focus of prisons and their classes interfere with the primary focus of keeping prisoners securely contained. This runs counter to the DCS's stated policy mandate to 'develop the Department of Correctional Services into an institution of rehabilitation' (DCS, 2021).

What adult educators teach

What adult educators teach is determined by the official unit standards for the AET/ABET levels offered, and the levels offered are determined partly by the demand for them and partly by posts approved by the DHET. Changing demand from learners has resulted in a shift upwards in what is taught at CLCs, some of them offering only AET/ABET Level 4 (NQF 1, equivalent to Grade 9) and at FET level (AET Levels 5–7), the Amended version of the Senior Certificate.

Across all provinces, educators reported increasing difficulty in recruiting learners to register for AET/ABET Levels 1 and 2 (equivalent to school Grades 1–6).

Where AET Levels 1, 2 and 3 are still offered, educators teach literacy skills in local indigenous languages, English, and Mathematical Literacy/Numeracy. At AET/ABET Level 3 (equivalent to school Grades 7–8), some educators also teach introductory courses to the subjects offered at AET Level 4.

At AET Level 4, adult educators teach English, Mathematics and Mathematical Literacy, Ancillary Healthcare, SMME, Human and Social Sciences, Travel and Tourism, Life Orientation, Early Childhood Development (ECD), Wholesale and Retail, Natural Sciences, and occasionally, Arts and Culture, and Information and Communications Technology (commonly called ICT).

At a few CLCs, adult educators teach non-formal options such as sewing, beadwork, gardening, coaching for learners' licences and, very occasionally, computer skills.

Programmes run in prisons appear on the whole to be far better resourced than those offered in other CLCs. Although educators complain of difficulties with logistics for classes in prisons in that prisoners must be accompanied by a guard to and from classes, and sometimes are prevented from attending classes for various reasons to do with prison procedures, they are at least provided with teaching and learning materials and stationery, and have access to electricity, water and toilet facilities.

The fact that the number of adults choosing to learn at CLCs is steadily dropping is a clear sign that what adult educators are required to teach is not attractive to the adults they are trying to recruit.

What adult learners want them to teach

Many adult educators receive repeated requests from community members for learning options that they are unable to meet and expressed their frustration at not being enabled to access training or make any progress towards meeting these requests. Most commonly, people ask for skills training, particularly computer skills, catering, agro-processing, plumbing, bricklaying, plastering, electrical work, carpentry and administration skills. Few CLCs have

access to the facilities needed for teaching these skills – most use school classrooms after hours – and very few adult educators are trained to offer these skills, although many are keen to gain this training.

Where centres do not offer Grade 12, there are many requests for it, as well as requests for AET Level 4 subjects, particularly Ancillary Healthcare and ECD, since armed with AET Level 4 certificates in these subjects, learners have greater chances of employment or income-generation.

Adult educators are disheartened that these requests are not acceded to.

Adult educators' sense of their own training

Adult educators readily expressed their need for further training, most commonly in:

- further training to improve their capacity to teach what they already teach;
- workshops to keep them abreast of current developments in what they perceive as a fast-changing teaching environment;
- training in assessment and moderation;
- computer skills;
- remedial teaching; and
- meeting their learners' need for skills development.

Many adult educators stated their need for developmental workshops 'so that we can teach effectively', but, nevertheless, perhaps as part of affirming their identity as members of the group of adult educators, and with reluctance to admit to weakness in the group, state that they regard their initial training as adequate. This insistence may derive from a sense of loyalty to the organisation at which they were trained and an unwillingness to denigrate it, or possibly from a fear of jeopardising their continued employment by expressing misgivings about the adequacy of their training.

Some under-trained educators who stated that they had no need of further training are perhaps unaware of how further training could benefit them. Also, in some remote rural areas, educators are so used to working on the basis of inadequate training that they are not even aware that as educators they need more understanding of the subjects they teach, of adult learning and of effective teaching techniques.

Adult educators' sense of the roles they play

Adult educators share a sense that they have a lower status and earn less than educators in mainstream schools and TVET colleges, but believe that they have a strong work ethic, support one another and make real differences in the lives of their learners. In the expression of this shared sense of identity, they epitomise an aspect of Tajfel's social identity theory

(McLeod, 2019) which sees people searching for positive distinctiveness in their group as opposed to other groups. This positive group identity extended to their shared conviction of how committed adult educators are to their learners and to helping their learners find solutions to problems in their domestic, social and financial lives. Equally common was a sense of teamwork and cooperation among adult educators. This was another demonstration of a shared perception of group solidarity and cooperation in the face of commonly felt disadvantage and a lack of acknowledgement from established authorities. Adult educators said:

> You become a mentor. Adult learners have different problems from home. For instance, some of them are married, they come from disadvantaged families, they are preoccupied. As a mentor/educator you have to motivate them.

> We do good work helping people who did not get a chance to learn.

> We help learners who are rejected from school because of their age, and help them to achieve.

> It is fulfilling working with people who are sure what they need. We are changing their lives not only academically but the behaviour as well. They change at times even though they were badly behaving. That makes us feel good.

> Seeing them [the learners] becoming somebody in the community like businessman, ward councillor is good.

> We even visit the learner at home to understand reason for being absent or dropout.

> We take extra hours for the benefit of learners without being paid.

> We go an extra mile in order for learning and teaching to flow as expected.

This commitment does not lead to good academic results overall in the state adult education system. In 2018, of the nearly 90 000 who registered for AET/ABET Level 4, although the pass rates for some subjects were above 70%, overall, only 31% of learners completed the course, 28% dropped out and 41% failed (DHET, 2019a).

However, for many learners there are more important gains to be made than passing school-type examinations, and there is a strong sense among adult educators in all the provinces – even among those who teach only a few hours per week and earn very little – that they are enabling their learners to improve their lives. These educators derive satisfaction from seeing their adult learners grow in confidence, become less dependent on others and apply the skills they have gained in their classes to actual situations, or find employment or get promoted. Adult educators often try to help learners solve serious social and financial problems or cope

with difficult situations. They therefore see their roles as including social mentorship and support. Community educators in one NGO, concerned about the safety of young learners who did not conform to gender-related expectations in their community, acted to protect them:

> We involve SAPS because they will need protection orders. Communities want to kill them for what they are and they call them demons and other names.

Educators in prisons cope with particular difficulties and describe both the frustration of working with unpredictable obstacles such as lockdowns, searches, court appearances ('You are improvising every day,' they say), and times of great fulfilment. This happens when prisoners gain skills and understanding that may help them play a constructive role in their families and communities after their release. A number of these educators spoke of having a mission to persuade their learners to learn skills that they could use to support themselves and focus on living positive lives after their release. Educators in prisons say:

> [in this prison] educators treat learners as their own child to assist them have a better future if they got released one day.

> The education we are giving them is assisting offenders a lot, they register with TVET Colleges.

> Educators even use their own resources to help the learners, use their [cell phone] data to get information [for the learners].

In some prisons, some of the educators are themselves prisoners. They say:

> It keeps our minds active.

> It keeps us busy when we are sitting in our cell - it is keeping us away of silly things.

> Award ceremonies motivate other inmates to do well and to take education serious.

Prison educators acknowledged that some learners are re-arrested and returned to custody after their release, but spoke of the satisfaction they feel when prisoners' parents and community members praise them for improving their learners' behaviour. They state that family members are sometimes grateful to them for enabling prisoners to become providers for their families. Some prison educators reported that their ex-learners now conduct awareness programmes in schools, churches and other community gatherings, where they raise awareness of the negative consequences of being convicted of crime and of imprisonment. All of these successes could be seen, in terms of Tajfel's social identity theory (Brown, 2020), as instances of the search for the positive distinctiveness of their own group, since they imply that they make more of a difference in their adult learners' lives than mainstream school educators do in their young learners' lives.

Adult educators' enthusiasm for their work may arise from the immediacy of the results they see when adults apply new skills to situations in real contexts or to the satisfaction derived from adult learners' becoming more independent and increasingly proactive in their everyday lives. The stakes are higher in prisons since their educators teach adults who have offended society and who, given that South Africa has one of the highest recidivism rates in the world (Shishane, 2020), stand a high chance of continuing along a destructive path. The accounts of learners' successes accentuate how unfortunate it is that a low proportion of South African prisoners attend classes. Statistics are not available, but some of our prisons have no education programmes at all. Among the prison learning centres visited, the rate of participation in education programmes ranged from less than 1% of the prisoners held at the prison to 15%. A common lament among educators working in prisons was that prison management did not see education as a priority and that it made little effort to shape the logistics of prisons to ensure that prisoners had access to education programmes or that, once enrolled, the inmates could attend classes regularly.

Advantages adult educators see in their work

The first advantage adult educators noted is that teaching adults is easier and more pleasant than teaching children. Since adult learners are not required by law to attend classes, only those who choose to be in class attend and educators do not have to try to force unwilling learners to study.

Second, they described the satisfaction experienced when their learners progress educationally, noting that few jobs yield the special kind of satisfaction that comes from restoring lost rights.

A third aspect of their work valued by many educators was confidence in effective teamwork at their CLCs; encouragingly, this appears to be a common experience among adult educators across the provinces, stressing the support they give and can expect from one another. In this, adult educators reflect a key component of social identity theory: that the strength of people's identification with an in-group is associated with a bias towards their own in-group (Brown, 2020). Related to this may be the appreciation of effective leadership, expressed by some educators who felt that their CLC manager facilitated their work well.

Another advantage is seen by some simply in the relief from deprivation that adult education offers, and some educators expressed gratitude at the provision of learning materials and equipment, or at receiving invitations to attend training workshops.

Problems and disadvantages faced by adult educators

Although some urban CLCs now accommodate adult educators in working spaces that are conducive to effective teaching and learning, for many adult educators, particularly those in rural areas, little appears to have changed in their conditions since the mid-1990s. Many of them lack the basic facilities needed for adult classes (DHET, 2017; Land et al., 2021).

The problems adult educators cope with relate mainly to their working conditions, with no job security, a lack of resources, poor support, a lack of opportunities for professional development, and often unsafe premises, especially during winter when darkness falls early, and they risk being attacked on their way home from class. Another common complaint related to having insufficient paid teaching time to complete the required work. Adult educators who are paid for very few hours per week (usually because they do not have many learners) were particularly aggrieved about having to cover as much work as educators who are paid for more hours per week.

In addition, learning and teaching materials are supplied for some subjects only, or just one copy of a required resource is supplied and, predictably, adult educators who are compelled to teach without resources, or must find and pay for their own, are clearly in difficulty. Many reported that they manage by borrowing books from school teachers and collect cash from their learners to travel by taxi to a photocopy shop and get copies printed. Although a few adult educators reported that they work closely with DHET officials, most feel that they are not actively or adequately provided for and sustained. Educators working in prisons and paid by the DCS tend to feel particularly marginalised. In a sharp reflection of social identity theory's premise of the perception of one's group as separate and perhaps in competition with comparable groups (Brown, 2020), some believed that DHET officials looked down on them because they work in prisons and deliberately excluded them from communications sent by the DHET to adult educators teaching in CLCs outside prisons. An especially embittered statement was:

> They treat prison educators as outsiders and they just see prisoners as not worth bothering about.

For adult educators at CLCs housed in schools, the perceived stigmatisation of adult learning has been aggravated by the shift of control from the DBE to the DHET, which has created logistical problems for them. Now that they are no longer under the provincial departments of education, some host schools are less willing to accommodate their CLC, with staff at these schools saying: 'We don't know you anymore'. At one school, which apparently charged the CLC to use their premises, educators reported that:

> Now SGBs [School Governing Bodies] want more money per month. The agreement was R2 500. Now the SGB wants more money for us to use the premises.

Finally, adult educators expressed concern about their own lack of capacity to meet requests for learning from the communities surrounding them and are unhappy about the dearth of further training opportunities open to them, especially as they cannot afford the few that are offered. University fees range upwards from R20 000 per annum for part-time qualifications and this is clearly beyond what adult educators can afford on their wages.

It is likely that this sense of continued relative deprivation affirms the sense that adult educators have of themselves as a minority group. In situations such as this, their identification with the group is a strong influence on their self-concept and behaviour (Brown, 2020), so that they affirm and strengthen each other's sense of deprivation, pointing with bitterness and indignation to hardships they put up with. For example:

> One educator had to go 3 months without receiving a salary which was enough to put him in bad books of credit rating ... damaging his ... reputation.

> Some educators have worked in advance [while they wait for their contracts to be approved] but cannot claim to be back paid for the months they worked without getting paid.

> You feel that the centre is like a dumping ground for dropouts, thieves and disables. Some of the learners are awaiting trials so they use the centre as a reason to escape being held in prison.

> Educators earn stipends with no medical or housing benefits.

> One educator has been teaching for more than 20 years and will retire with no retirement package.

> We have no job security – we don't know what will happen tomorrow about our jobs.

In facing these problems and attempting to ameliorate those that they can, adult educators try to act as a group. In doing this, they gain confidence that their perception and understanding of the problems they deal with is accurate, and their chances of achieving positive change for themselves is increased if they act as a group rather than individually (Brown, 2020).

Many adult educators, particularly the worst resourced, have very low expectations and hopes. At some remote rural centres, educators assured researchers that they had no problems, while to the researchers, multiple problems were obvious. These included:

- no office space or office furniture;
- inadequate learning and teaching materials;
- no cupboards to store the little material they had; and
- broken or undersized desks.

At one remote rural CLC, which had no electricity or copying facilities, educators who were trying to teach from a single copy of the learning materials complained only of the lack of access to toilets and drinking water. In this, they epitomised adult educators in rural areas who are so accustomed to severely inadequate resources that it does not occur to them that they or their learners should have amenities appropriate to learning in the 21st century and

the digital era. Where outsiders see glaring needs and an absence of resources, they see normality. At another, similarly poorly resourced CLC, educators said:

> We have no toilets and no taps. But we get electricity from neighbourhood, we pull it by extension cord [here the electricity was being tapped from an Eskom line via an illegal connection].

Conditions of service of adult educators

Historically, state-employed adult educators had far inferior conditions of service than those of school teachers. Most were temporary employees on 11-month contracts with none of the benefits that ordinary school teachers had (Harley et al., 1996). Earnings were based on qualifications and hours of teaching, so the remuneration received by adult educators varied according to their contexts. In past years, adult educators at state-run centres were paid via a claim system in which educators would submit claims for hours they worked monthly. The system was cumbersome, slow, unreliable and vulnerable to fraud.

According to both DHET officials and adult educators at CLCs, this claim system is being replaced by yearly renewable contracts with salaries or stipends paid monthly. Although adult educators see this as a positive change, many believe that they are not adequately remunerated for the work they do. Since there is great variation in their rates of pay, there is also a risk of envy and resentment associated with different levels of earnings. Adult educators without job security are understandably prone to leaving to pursue any contract that offers more security than they have.

Educators who work at some prisons are paid by the DHET and at other prisons by the DCS. At the time of the data collection for this study, rates of pay appeared to range from about R9 000 per month for educators at the start of their career to approximately R30 000 per month for managers of centres. In the few NGOs encountered, the earnings of educators vary widely, with some people working as volunteers and others earning moderate salaries.

It has long been argued that adult educators in the state system should have conditions of service similar to those of permanently employed school teachers. There has not been much movement in this direction, although there is a reduction in the use of school teachers working after hours in CLCs to gain extra income, and the move away from the claim system to annual contracts is a positive change.

A negative side-effect for educators of the DHET's *Policy on minimum requirements for programmes leading to qualifications for educators and lecturers in adult and community education and training* (DHET, 2015b) is that educators with a Higher Certificate in ABET, which at least was a genuine adult educator qualification, were no longer considered professionally qualified and therefore also not eligible for any permanent posts on offer.

Support that adult educators ask for

Educators' appeals for support were touchingly modest and remarkably similar in all provinces, mirroring problems in their working lives, and showing their awareness of the need to develop skills for the digital age. Among wishes for improved work conditions, they state that they need, for example:

- More support from DHET. They only call us to get reports and information. They don't support us.
- Materials for skills training for livelihood, like sewing, fashion designing, baking, welding, catering.
- Not just one copy of a textbook.
- More paid teaching time so we can complete the work.
- Training so that we can teach the skills.
- Transport for learners in winter to stop them dropping out.
- We need to learn computers.

Adult educators' understanding of current developments in the field

Very few of the adult educators interviewed had any understanding of the new CETC system that, on paper, has already been implemented. They reported having heard that there was to be a change linked to the shift of adult education and training from the provincial education departments to the DHET, but they had no knowledge of policy documents such as a national policy on community colleges (DHET, 2015a), or of the *National Development Plan for the Implementation of the White Paper for Post-school Education and Training System, 2019–2030* (DHET, 2019b), or of any new possibilities for learning that should be integral to the new system. Some knew of the change in administrative structure so that CLCs would be clustered, but none of them had heard anything about the non-formal learning offerings, proposed partnerships or the improved conditions for educators and learners in the new system. A common expectation among them about the changes they had heard of was that their position is likely to get worse. Adult educators expressed what they knew of the CETC system in statements such as these:

It doesn't really make sense to ground people.

We know about it and it doesn't change anything, it's not well applied. Only the change of name.

We are a community college, we have main centres and have a satellite which form this centre.

Conclusion

In 2000 the Department of Education received a substantial report on adult education practitioners (Khulisa Management Services, 2000) noting the problematic conditions of service, the need for professionalisation and the lack of data. Among the solutions proposed were:

- a thorough overhaul of the conditions of service;
- proper job descriptions;
- a cluster management system;
- better career mobility;
- adequate pre-service training and access to further qualifications; and
- performance criteria against which educators and centre managers could be evaluated.

It noted the extreme frustration of the adult educators. This frustration continues in 2021 as adult educators relay requests for development to the DHET, but without success. For them reality lags sadly behind the bright bold world of policy that sketches a vision of growing numbers of adult educators and adult learners teaching and learning in well-resourced centres, enjoying the benefits of life-enhancing formal and non-formal learning.

In summary, the study showed that adult educators see themselves as having lower status than mainstream educators and are aggrieved that they receive little provision, official support or acknowledgement for the work they do. On the other hand, they have a strong sense of commitment to one another and to their learners and derive great satisfaction from enabling some of their learners to make positive life changes.

The overwhelming sense one has of adult educators in this country is that with their commitment and desire to serve, they embody enormous potential for benefit, especially for disadvantaged communities, but that the potential remains largely unsupported and untapped.

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Assessing work-based values: The missing link in improving youth employability

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ABSTRACT

Technical and Vocational Education and Training (TVET) colleges are intended to equip youths with work-relevant skills, but the capacity of the labour market to absorb them is limited and South Africa has high levels of unemployment. Employers argue that young work-seekers from TVET colleges may well possess technical skills but lack employability skills, including appropriate work-based attitudes and values. In response to this scenario, a team of experts designed a short, interactive programme for TVET college students to acquire an improved understanding of and insight into their own values and how these inform their behaviour in the workplace. The values selected were respect, accountability, self-improvement and perseverance. The programme's intended outcome was to increase the participants' awareness of the link between values and their actions so that they could improve their own decision-making and their relationships with colleagues in the workplace. Following this programme, the students were afforded a period of workplace exposure during which they were required to reflect on their experience and how workplace behaviour revealed their own and work colleagues' underlying values. A crucial challenge for the project team was to be able to measure any impact on the participants' understanding of the values and how this understanding might guide their behaviour. The focus of this article is on how the assessment instrument was conceptualised, designed and piloted in South Africa and Kenya. The instrument was required to measure effectively any changes in the participants' understanding of the meaning of each value and the adjustments in their ability to apply the values in real work-based scenarios.

KEYWORDS
Values, workplace, work-based, youths, work, assessment

Introduction

The labour market context

South Africa has a serious social problem of youth unemployment, with 63,2% of youths between the ages of 15 and 24 being unemployed in the fourth quarter of 2020 (Statistics South Africa, 2021:30). This is coupled to rising numbers of Technical and Vocational Education and Training (TVET) college graduates and the limited capacity of the labour market to absorb them (Kraak, Paterson & Boka, 2016; De Lannoy, Graham, Patel & Leibbrandt, 2020).

The South African Department of Higher Education and Training (DHET) argues that the main purpose of TVET colleges is 'to train young school leavers, providing them with the skills, *knowledge and attitudes* necessary for employment in the labour market' (emphasis added) (DHET, 2013:11). Clearly, the DHET recognises that attitudes – which stem from underlying values – are a crucial dimension of employability. Institutions of learning in South Africa, such as the TVET colleges, need to take up the challenge of informing young people about their own values in relation to the work values that are associated with enhanced employability and enabling them to become familiar with those work values. The research therefore attempted to create a process in which students' self-awareness of work-related values could be clarified and enhanced.

Individuals' values and their working life

Values matter because they inform motivations and intentions; they therefore shape human action in almost any behavioural setting. Besides the contribution of technology, worker behaviour is ultimately the most important contributing factor in workplace efficiency and enterprise productivity, competitiveness and innovation.

Every day, values inform behaviours and attitudes in the workplace. If students were afforded the opportunity to debate and formulate their own work-based values while at college or when newly employed, they would be better equipped to achieve their potential by learning from, working with and relating at a personal level to other people at work. Accordingly, students need to become conscious of the workplace as a context in which, in addition to the requisite knowledge, skills and competencies, the expression of particular work-based values is appreciated – not only by employers, but also by co-workers and supervisors.

What is meant by an individual's work-based values? These are the values that inform and contribute to an individual's behaviour in the workplace. The workplace is an institutional form that defines the parameters of working activities and relationships in modern – and now post-COVID-19 – workplaces. As a subset of an individual's general values, work-based values are of particular interest to us because they shape attitudes about and interactions with co-workers and the way in which the individual approaches their work tasks and

responsibilities. We contend that work-based values constitute a legitimate subset of study, since working constitutes such an important domain of human activity to which many individuals commit large portions of their adult lives. Our interest, then, lies in making sense of the ways in which such values contribute to the behaviour of workers and have a bearing on their ability to gain, retain and even regain employment.

Values in the workplace

A workplace is a particular institutional form with purposes, an organisational shape, functions and processes. It requires particular types of working relationships, skills and personal characteristics of those who work in it. Our focus is on values in the workplace because workplaces often bring together people who have different age, gender, cultural, ethnic, religious and class backgrounds, all of which contribute to the value profile of an individual. Since workplaces are seldom culturally homogenous, employers value workers who are able to understand, appreciate and adapt to the social environment of the workplace while at the same time possess the capacity to respectfully express and defend their own values and behave in accordance with them (Paterson, Keevy & Boka, 2017). We argue that workers' values are of considerable importance in workplaces to the extent to which these values enhance – or constrain – the quality of working relationships in an enterprise; they are also important in enhancing or constraining the capability of the enterprise to achieve its productivity targets and sustainability potential. Furthermore, in the workplace, as in other institutional environments, we assume that individual workers differ in the levels of awareness they have of their identities and their own values and of how these values inform their thinking and actions while at work (Lloyd, Roodt & Odendaal, 2011).

Values are an important predictor of human behaviour. Employers therefore pay close attention to the workplace values that prospective and current employees express. As relatively durable social and psychological constructs, values reflect what individuals and human groups hold to be important, inform how they live and work, and define for them what is good or bad, desirable or undesirable. Over the years, job descriptions have also progressively included work-based values as required competencies of potential candidates. In our research, we acknowledged that the acquisition of values is part of the process of individual identity formation (Lloyd, Roodt & Odendaal, 2011).

Our research was concerned primarily with work-based values that are foregrounded when employers select workers who possess the values which fit the jobs that need to be done in their establishments. By 'work-based values' we mean the set of values that are relevant in a particular institutional environment, namely, the workplace. There, specific work-related behaviours, rules, expectations and relationships are emphasised – in other words, the values employers are looking for in work-seekers. Employers want to select individuals who bring certain behavioural and attitudinal values to their daily work and these may include, among other things, a work ethic, a positive attitude and adaptability (Loretto, 2015).

Work-based values programme

As alluded to earlier, TVET college graduates often struggle to find work in the constrained and consequently highly competitive local employment market. Given the significance of values in the workplace, it can be argued that as part of their preparation for the world of work, young people such as those in training at TVET colleges would benefit appreciably from opportunities to explore their own positions with respect to these values.

For some time now, the inclusion of values in a teaching and learning programme has attracted some controversy. Observers rightly pose questions such as: 'Why values?', 'Which values?', 'Whose values?' and 'How?' or 'Through which methodology are values dealt with in classrooms and lectures?' These issues are relevant in South Africa, given its history of colonial and apartheid racial indoctrination in schools. Paterson, Keevy and Boka (2017) have critically analysed teaching and learning values with reference to the South African experience. Furthermore, in the context of employment, legitimate concerns have been expressed that students at TVET colleges can be 'prepared' for work through inculcating in them values of subservience to workplace and employer expectations. In the view of critics, this intention can be part of utilitarian 'job readiness' programmes, some of which emphasise worker malleability to meet employers' expectations (Fugate, Kinicki & Ashforth, 2004) and may also be embedded in 'employability programmes'.

In this project, a work-based values programme involved providing young people with the opportunity to digest the issues, understand values they do not necessarily subscribe to and, upon reasonable reflection, internalise values that will guide their choices and behaviour as individuals and as work-seekers. In other words, the aim of the programme was to empower young people to be able to manage their relationships and engage with their employers, and also with colleagues. This is because the expression of values is much broader than the employer–worker axis: it also takes place between workers themselves, in relation to gender, for example. When developing our programme, we chose to focus on four values which we argue are fundamental to informing daily behaviour in the workplace, namely: (i) respect; (ii) accountability; (iii) self-improvement; and (iv) perseverance. These values are relevant in everyday environments, but were selected because they are also particularly appropriate to the working environment. Furthermore, they are relevant across occupational categories, which was preferred for the design of the initial programme. They could therefore also apply across a variety of study programmes. Certain values – for example, 'precision' – could well be considered more relevant in particular occupational settings, though.

To this end, the programme involved offering a four-day values clarification process which was first offered to a group of 17 second-year (National Certificate (Vocational) Level 3) Business Studies students at a South African TVET college. The aim of this experience was to engage the participants in developing their understanding of the four selected work-based values (respect, accountability, self-improvement and perseverance), after which they were placed in employment for five working days. During that period, they were required to

observe, record in their logbooks and make sense of their work relationships where values-related issues emerged.

Assessment of the programme

The research was therefore concerned with values that apply in a particular environment which has parameters and role expectations that are different from the family environment or an educational institution. This focus provided a defined institutional framework within which particular values relevant to the workplace were selected for exploration. We argue that this institutional framing and contextualised application of values provided the grounds for developing a viable and useful assessment approach, which we describe in this article.

Devising a means of assessing the impact of the programme was essential from an evidence-based perspective. There would always have been doubt about what the intervention had achieved. At the same time, as the discussion above has acknowledged, values are an elusive concept. In developing a means of assessing the impact of this programme, some options were considered. A large body of work has accumulated on 'work values', which have been defined broadly as qualities that people seek in their work, occupation, or career (Judge & Bretz, 1992; Zytowski, 2006:865; Kalleberg & Marsden, 2013). Examples of this work include assessment tools such as Donald Super's Work Values Inventory (WVI) (Super, 1995). This field is also associated with studies of career development, vocational behaviour, job choice and attitudes to different occupations. Generally, it is asserted that work values predict young people's choice of occupation according to the associated occupational benefits such as salary and work satisfaction (Super, 1995). The focus of this research has a different application from that of the 'work values' literature.

A further requirement considered in identifying a viable assessment approach was to choose a method that could identify any change and progression in participants' conceptual understanding of the underlying values and in their ability to apply this understanding by selecting an appropriate response to a scenario involving a work-based value. Whereas in the reported literature there are examples of studies which have sought to explore work-based values (see, e.g. Wong, 2013), none of the assessments used was deemed to be appropriate to our study. We therefore had to develop our own assessment instrument(s) that could be used both as a baseline and as a gap analysis (pre-test) measure. The instrument(s) also served as a multiple post-test measure to gauge the compounded effect of the four-day work-based values intervention, which was followed by accounts of the participants' experiences during their work placement.

Designing the work-based values assessments

The process of selecting the values to be assessed began with an internet search of the literature for sources on values generally and on work-based values in particular. This resulted in a set of 20 frequently referenced values, which were then considered in turn by a panel made up

of project and participating TVET college staff. First, it was important to engage in discussion with the participating college staff and forge a partnership between the research team (comprising the authors of this article together with experts from the field and the fieldwork manager) and staff from the college such as lecturers, career development officers, placement officers, industry liaison officers and campus managers. This multifunctional approach meant that the variety of elements which needed to be taken into consideration could be considered. The design approach followed a systematic process in which the key stakeholders collaborated from the outset in the selection of the work-based values to be included, the selection being based on what was considered to be most relevant to the TVET context in South Africa. As indicated above, the four values chosen were respect, accountability, self-improvement and perseverance.

The next stage in the process saw the development of construct maps for each of the four values and their corresponding assessments. As noted by the American Educational Research Association (AERA), the American Psychological Association (APA) and the National Council on Measurement in Education (NCME) (2014), the validity of the construct of an assessment begins with specifying the intended construct that the assessment is proposing to measure. This, in turn, depends on operationalising the value construct in order to create a theoretical definition (Cronbach & Meehl, 1955). To realise the goal of operationalising each value, four construct maps were developed in line with Figures 1 to 4 below.

Figure 1: Construct map for the value *respect* (own elaboration) *(Source: authors)*

Figure 2: Construct map for the value *accountability* (own elaboration) *(Source: authors)*

Figure 3: Construct map for the value *perseverance* (own elaboration) *(Source: authors)*

Figure 4:   Construct map for the value *self-improvement* (own elaboration) *(Source: authors)*

This process involved desktop research and a document review to guide the identification of an initial set of dimensions that operationalised each value. Once draft sets of dimensions had been identified, these were refined through an internal workshop. This was followed by a theoretical saturation exercise (Saunders, Sim, Kingstone et al., 2018) using Google-based materials to determine whether any other dimensions of the value constructs could be identified. The saturation process contributed to domain coverage, which is a fundamental part of content validity (AERA et al., 2014). The last step in this process was an in-depth engagement session with the research team to finalise the value constructs. The in-depth discussions served a third purpose: to ensure that the process was replicable and therefore reliable across the development of the construct maps. Reliability is a prerequisite for validity (AERA et al., 2014) and was confirmed during our analysis of the pilot data using Cronbach's alpha (Sattler, 2008).

When designing the assessment instrument, the research team decided that the most appropriate structure and format for presenting the four values would be a set of scenarios that depicted typical situations which young people might find themselves facing in the workplace. The associated answer options would either demonstrate the value under consideration or not. With content validity defined as the extent to which a measure represents all facets of the construct (Lawshe, 1975), the research team worked through the various answer options to ensure that they covered all the dimensions of the value construct as defined in the construct map for each specific value. Whereas, initially, on average three scenarios per value were developed, in the final version of the instrument no more than two scenarios per value were required. Once the scenarios had been created with answer options,

the team came together to review and refine each scenario and answer option. This was an in-depth process of review, where the scenarios were adapted to the target audience (i.e. TVET college students) and where the answer options were checked to ensure that their lengths were balanced. The following scenario, which assesses the perseverance value, is an example:

> I am doing a part-time course because I know that it will be good for my future in the company. I spend lunchtime in the office on my course work and get to the office early to fit in an hour before work. My work colleagues keep criticising me and making me feel like I should give up because I cannot pass the one module and because I keep missing out on opportunities to get to know them, to have fun and to build better relationships with the managers. What do I do?
>
> **Tick *every option that you think shows perseverance*. There is more than one correct answer option.**
>
> - I believe that if I put my mind to it and stay dedicated, I can succeed in passing the module and the course.
> - I start to spend some lunchtimes with my colleagues to improve my relationship with them, even though I know it could affect my course work badly because I don't have any other time to study.
> - I decide to carry on spending my lunch times (sic) and time before work on my course work so that I can finish my course.
> - I make a plan with my colleagues that I join them twice a week over lunchtime, but that I will carry on studying over other lunchtimes and after work to catch up. I will not give up on my course work, even if they keep criticising me.
> - I keep studying during work hours so that I can take lunchtime with colleagues and managers, which could affect my work badly.
> - None of the above.
> - All of the above.

The last step in the development of the scenarios and the answer options was a plain language edit. This was done to ensure that the language used would be accessible to young people, particularly those for whom English is not their first or home language.

Piloting and field testing the assessment instruments

First pilot

In August 2018, the work-based values assessment instrument was piloted with 16 purposively selected young people who were not associated with the institution where the work-based values programme took place. Of the 16, one had a permanent job as a call-centre agent, nine had been employed only on a temporary basis on contracts varying in length from a few days

to up to seven months, and the remaining six had never been employed in any capacity. Three of the young people were currently studying at TVET colleges and two had completed TVET courses.

The young people were required to indicate which answer options represented most closely their responses to a particular value. Allowance was made for marking each scenario according to the number of options that the candidate correctly selected as representing the value in question. Each scenario was scored out of one, with partial marks allocated for each correct response. The total marks allocated per person were then calculated. After that, internal consistency reliability was calculated using Cronbach's alpha (Sattler, 2008): with a minimum of 0 and a maximum of 1, a reliability of 0,91 was achieved. Considering that only 16 respondents were involved in the pilot and only 13 scenarios were considered, this indicates good internal consistency in the assessment. The high reliability can then be interpreted as an indication that all the scenarios consistently measured the intended construct.

Using classical test theory (Champlain, 2009), the researchers then calculated the item-total correlation for each scenario. Item-total correlations can range from –1 to 1, with correlations between 0,2 and 0,8 indicating good discrimination between respondents achieving relatively high totals and those achieving relatively low totals on the assessment. In ten of the 13 scenarios, item-total correlations ranged from 0,48 to 0,80. Two scenarios had a high discrimination of 0,83 and 0,90 respectively, indicating that the scenario discriminated too well between relatively high and low performers. However, one scenario did not discriminate well between relatively high and low performers, with an item-total correlation of 0,17. This indicates that there was little difference between the scores achieved by relatively high and low performers in this scenario; alternatively, it could indicate that some high performers selected incorrect options and some low performers selected the correct options. This particular scenario involved an ethical dilemma where the respondents had to choose between accountability towards a friend or accountability for the business's money (see below) and they were required to decide based on their archetypal value system, that is, whether they value relationships more than workplace regulations.

Finally, the number of respondents choosing each answer option in a scenario was calculated. This gave an indication of how obviously a specific answer option represented a specific value or not. In the example below, assessing the value of respect, it can be seen that answer option e) was not chosen by any of the respondents. This indicates that this answer option was either too obvious or too obscure. It could also be that the answer option was not worded well. Such answer options were reworded before the second pilot:

> In a team meeting, my manager tells me to do something that I think is wrong for the project that I am involved in. What do I do?

Tick *every option that you think shows respect*. There is more than one correct answer option.

- Even though all the team members disagree with me, I carry on saying what I think and trying to convince the team that my solution is the best solution for the project. *4 respondents chose this option.*
- I value my own opinion enough to share my views and where I stand with my manager so that he/she knows what I think. *9 respondents chose this option.*
- I know my manager has his/her own views and I value my manager's ideas without insulting him/her. *10 respondents chose this option.*
- I agree to carry out my manager's solution, but I decide to also carry out my own solution to show my manager that I am right. *8 respondents chose this option.*
- I go against my manager in the meeting without thinking about his/her opinion. *0 respondents chose this option.*
- I treat my manager with dignity and explain that I understand his/her different views. *10 respondents chose this option.*
- None of the above. *0 respondents chose this option.*
- All of the above. *0 respondents chose this option.*

In addition, considering that none of the respondents chose options g) and h), these answer options were removed from the assessment for the subsequent trialling of the instrument.

After the first pilot, a focus-group interview was conducted with eight randomly selected participants. The purpose of the interview was to provide the participants with an opportunity to share their experiences of writing the assessment, to allow them to comment on the appropriateness (or otherwise) of the scenarios and the associated answer options, and to check that the materials had been written in language that was accessible and easy to understand. This would ensure that the assessment materials and the scenarios which they presented were easy to understand and that the majority of school-leavers and TVET students would be able to engage with them. The language levels of the assessment were also tested through this exercise.

All eight participants (four males, four females) were resident in the Johannesburg area; five were either currently enrolled at TVET colleges or had completed TVET courses, and one had dropped out of university. The remaining two were engaged in part-time work and had not yet studied further. Whereas all eight participants had some understanding of the differences between full-time and part-time employment, they did not display any understanding of, for example, the benefits associated with full-time employment versus a fixed-term contract. Only two of the eight students had ever been in full-time employment; one of them was employed full time at the time of the assessment. Overall, all eight found the scenarios relatable and had experienced some version of these scenarios in either a workplace or a personal context:

> Yes, I think they were pretty realistic. I've experienced two of them, [the IT one], the computer crashed, and I didn't back it up and the one where you had to finish a certain task and tell your friends that you can't go out, but yeah, they were very relatable on my part.

> There was a lot that was relatable because I help [the line manager of casual staff] a lot with the meeting stuff and I know how things happen with her; and also in my personal life there are a lot of things that I can relate to, not all to be honest but most of them were relatable.

> I think the one where you had to finish client work or where you had to meet a client deadline and then you have to call the whole team to come and help you … that was relatable for me; I know we have to work as a team to finish a client's work, even if it's not my work, but I had to help my colleague to make the company look good.

The participants felt that the language used in the instrument was accessible and they did not believe that presenting the instrument in English presented a problem; on the contrary, they found the examples easy to understand and phrased in simple language. They did, however, indicate that if they had been given more time, they might have given more detailed answers or slightly different answers if they had been able to mull over the scenarios a bit longer. They also indicated that they had given much more thought to answers and more detail in focus-group sessions because these involved speaking rather than writing. Of the ten scenarios discussed in the focus group, only one proved to be problematic in both the quantitative and the qualitative analysis. It was, however, decided it would be premature to exclude the scenario before the second pilot.

Second pilot

For the second pilot, a slightly different format was used. Whereas in the first pilot the young people were asked to identify the answer option that represented the value in question, in the second pilot they were asked what they were likely to do in a specific situation. This allowed for a more nuanced interpretation of the responses. A four-point rating scale was used to avoid a situation where the respondents indicated the most neutral option – for example, 3 in a 5-point scale. An example is given below.

The following question assesses the value of respect:

> I do not get on well with one of my co-workers. They have not been with the company for very long and have different religious and cultural beliefs. They have just asked me to help them carry ten boxes of files to the car. What do I do?

Table 1:   Response table for respect (*Source: authors*)

Tick how likely you are to do the following:

	UNLIKELY TO DO	SOMEWHAT UNLIKELY TO DO	SOMEWHAT LIKELY TO DO	LIKELY TO DO
Instead of me helping them I ask a few people to help them with the boxes.				
I don't help them. I don't see why I should help them carry the ten boxes of files because it will not help me.				
Although we have different amounts of work experience and different cultural backgrounds, I still help them to carry the boxes.				
Although I really don't like being in the same room as them, I treat them in a kind way by helping them when they need me.				
Because I have a work task that I need to finish soon, I tell them that I must stay focused on my work and that I don't have the time to help them.				
I tell them that they are responsible for performing all the duties given to them, which includes carrying boxes.				

In September 2018, this format of the values assessment was piloted with a separate group of 16 young people who had not participated in the first pilot. Of the 16, five were in permanent employment. These included being a parking attendant, a telesales consultant, a hostess at a hotel, a swimming coach and a sound engineer. Two of the young people permanently employed at the time had had temporary jobs prior to being permanently employed. Ten had previously been employed only on a temporary basis. These temporary contracts varied from employment for a few days to five months. The remaining young person had never been employed in any capacity. This indicates that there was some prior exposure to workplace experience and learning in this group. Only three of the young people were studying at TVET colleges at the time of the assessment. The lack of access to tertiary education could be explained by (i) their attaining below the required marks in matric for access to post-matric studies; (ii) a lack of financial support for studying after matric; and/or (iii) limited motivation to study after matric. Other reasons, such as family obligations, also require young people to enter the workforce directly after matric.

The young people in our research study were required to indicate how likely they were to respond in a certain way to a particular scenario, according to the coding of the answer options as 1 to 4. Positive responses to each scenario were coded from 1 for 'unlikely to do' to 4 for 'likely to do'. For negative responses, reverse coding was used. Therefore, 'unlikely to do' was coded 4 and 'likely to do' was coded 1. This coding allowed for a total to be calculated, with higher totals reflecting more desirable responses to the scenarios. Then the internal consistency reliability was calculated using Cronbach's alpha (Sattler, 2008). With a minimum of 0 and a maximum of 1, a reliability of 0,84 was achieved. This indicates good internal consistency in the assessment. The high reliability could be interpreted as an indication that all the scenarios and the answer options consistently measured the same construct.

Using classical item theory, the item–total correlation for each answer option was then calculated. Item–total correlations can range from –1 to 1, with correlations between 0,2 and 0,8 indicating good discrimination between respondents achieving relatively high totals and those achieving relatively low totals on the assessment. On average, two to three answer options per scenario discriminated poorly between high and low performers, indicating that high and low performers either responded in more or less the same way or that high performers endorsed fewer desirable responses, whereas low performers endorsed more desirable responses. Answer options with low discrimination values should therefore be reworded or discarded. The table below indicates the overall results per scenario. Four of the 13 scenarios together with their answer options discriminated well between high performers and low performers. Interestingly, one of the four scenarios was less relatable to the responses of the first pilot's participants. Six of the scenarios had, on average, two answer options that needed to be reworded or discarded. Two scenarios and their answer options were then considered for deletion. The participants in the first pilot indicated that these scenarios were more difficult to relate to.

Table 2: Results per scenario for the second pilot (*Source: authors*)

SCENARIO	VALUE	NUMBER OF ANSWER OPTIONS	NUMBER OF ANSWER OPTIONS TO BE REWORDED OR DISCARDED	PRELIMINARY RECOMMENDATION
1	Respect	5	2	Keep scenario, but reword one answer option and discard one answer option.
2		5	1	Keep scenario, but discard one answer option.
3		5	2	Keep scenario, but reword one answer option and discard one answer option.
4	Perseverance	5	1	Keep scenario, but discard one answer option.
5		5	3	Keep scenario, but reword two answer options and discard one answer option.
6		5	3	Keep scenario, but reword two answer options and discard one answer option.
7	Accountability	5	0	Keep scenario and answer options as is.
8		6	3	Consider discarding the scenario.
9		6	2	Keep scenario, but reword two answer options.
10		6	4	Consider discarding the scenario.
11	Self-improvement	6	0	Keep scenario and answer options as is.
12		5	0	Keep scenario and answer options as is.
13		5	0	Keep scenario and answer options as is.

Owing to time and budgetary constraints, no focus group was conducted after the second pilot. However, the participants were engaged in a brief group discussion during which they were encouraged to provide feedback on the instrument in general and, more specifically, on the scenarios and the answer options. The participants indicated that they found it easy to relate to all the scenarios. This response differed from that of the participants in the focus group for the first pilot, who found some scenarios more difficult to relate to. This difference may be due to the diverse profiles of the participants in the two pilots. Unlike the focus-group participants in the first pilot, the participants in the second pilot suggested additional

answer options for two of the scenarios. For example, in the scenario which assessed the value of accountability, one participant suggested that the task could be completed during the two-hour commute on public transport and then submitted electronically prior to the deadline. This was a relatively sophisticated compromise between work and family responsibilities in the scenario.

Field testing

The revised work-based values assessment (from the second pilot) was then field tested in Kenya in October 2018. The testing took place as part of the Building Capabilities for Work and Life Programme. This programme aims to embed whole youth development (WYD) in the TVET system and to reach at least one million youths not in employment, education or training (NEET) in Kenya (Dalberg, 2019). Eleven respondents completed the values assessment. One of the respondents indicated that they had been employed before in a permanent capacity for a period of seven years; the remaining ten respondents were all employed in a temporary capacity at the time of the assessment. Internal consistency and reliability were calculated using Cronbach's alpha. With a minimum of 0 and a maximum of 1, a reliability of 0,8 was achieved. Once again, this indicates good internal consistency in the instrument. The high reliability could be interpreted as indicating that the scenarios and the answer options consistently measured the same construct. Using classical item theory, the item–total correlation for each answer option was calculated. Item–total correlations can range from −1 to 1, with correlations between 0,2 and 0,8 indicating good discrimination between respondents achieving relatively high totals and those achieving relatively low totals on the assessment. On average, two to three answer options per scenario discriminated poorly between high and low performers, indicating that high and low performers either responded in about the same way or that high performers endorsed fewer desirable responses, whereas low performers endorsed more desirable responses. Those answer options with low discrimination values should either be reworded or discarded.

The functionality of the answer options varied from the results found in South Africa. This could be because of the different types of sample being used, cultural differences or differences in language proficiency. At least one scenario per value functioned well, even with a very small sample of 11 respondents. It is, however, recommended that a large-scale pilot be conducted with TVET students to better assess the functionality of the instrument. Piloting the instrument with a larger sample and with TVET students would give an indication of its scalability and replicability in different environments.

Latest configuration of the assessment

After considering the findings from the second pilot, the revised values instrument can best be described as a rating scale based on four subtests, each dealing with one of the four values, namely, respect, perseverance, accountability and self-improvement. Each value subtest contains three scenarios followed by five or six items on which the respondents must rate

their own behaviour as 'unlikely to do', 'somewhat unlikely to do', 'somewhat likely to do' or 'likely to do'. As in the second pilot, positive responses to the scenario were coded from 1 for 'unlikely to do' to 4 for 'likely to do'. For negative responses, reverse coding was used; therefore, 'unlikely to do' was coded 4 and 'likely to do' was coded 1. This coding allowed for a total to be calculated, with higher totals reflecting more desirable responses to the scenarios. Table 3 below indicates the mark allocations per subtest. It should be noted that no overall score is calculated since we were interested in the relative performance of the students on each value.

Table 3: Structure and mark allocation for assessment after pilot 2 (*Source: authors*)

SCENARIO	VALUE	TOTAL NUMBER OF ANSWER OPTIONS PER SCENARIO	NUMBER OF ANSWER OPTIONS REWORDED AFTER PILOT 2	TOTAL MARKS PER SCENARIO
1	Respect	5	1	20
2		4	0	16
3		5	1	20
Total for respect				**56**
4	Perseverance	4	0	16
5		4	2	16
6		4	2	16
Total for perseverance				**48**
7	Accountability	5	0	20
8		5	2	20
9		6	2	24
10		0	0	Scenario discarded
Total for accountability				**64**
11	Self-improvement	6	0	24
12		5	0	20
13		5	0	20
Total for self-improvement				**64**

Conclusion

The functionality of the assessment has been tested using only two relatively small pilots in South Africa and one in Kenya. Therefore, only classical item theory could be applied (as opposed to Rasch analysis). Even though the assessment functioned well and qualitative feedback on the assessment was positive in all three pilots, to ensure the validity, replicability and scalability of the instrument a large-scale pilot involving a minimum of 200 TVET college student participants is needed. Since the instrument functioned well overall in the Kenyan environment, replicability in other African contexts may be viewed with some optimism. Furthermore, since the respondents in all three pilots were mainly non-English speaking and reported that the scenarios were relatable and the language used was easily understood, usage in this population may be viewed as successful. It should, however, be borne in mind that the work scenarios were developed to be applicable in a general business and administrative work environment. Despite the pilots showing that the development process and format of the values assessment functioned sufficiently well, in further use of the instrument contextual validity would need to be incorporated by developing work scenarios specific to the targeted population's context.

Most of the scenarios and the answer options functioned well, and the respondents could relate to the scenarios. Just under half of the scenarios would probably need some revisions of the answer options. Only two scenarios presented significant difficulties in both the quantitative and the qualitative analysis. However, as recommended, a large-scale pilot should be conducted before discarding any scenarios. Rasch analysis is also recommended. The problematic answer options could, however, be strengthened before another pilot is conducted in South Africa. Piloting the instrument in both South Africa and other African countries could yield data on the scalability of the instrument in South Africa and the replicability of its use in other African contexts.

We contend that this initiative to develop an assessment tool for a work-based values intervention makes two unique contributions: first, it applies a work-based values approach to improving student socio-emotional skills; and, second, it applies a rigorous process to developing an instrument that assesses impact. To elaborate: in the first instance, the research focused on supporting the development of work-based values of young people to improve their chances of finding employment, and values, being part of a set of socio-emotional skills (such as awareness of other people's feelings) which underpin a worker's ability to succeed in 21st-century labour markets (World Bank, 2021). Second, although socio-emotional skills are acknowledged to play a role in employers' judgements of worker 'employability', much more attention needs to be given to testing their impact empirically. On the African continent, as Betcherman and Kahn (2017:3) point out, there are 'important knowledge gaps where research could inform effective actions to improve economic opportunities for the region's youth'. Without research evidence, the relevance and efficacy of interventions cannot be established but the '… good news is that the evidence on what works and what does not in skills development, and for whom, is growing …' (World Bank, 2021). As a response, this

empirical study opens a door of opportunity to understanding the contribution of work-based values as part of skills development to TVET students intent on seeking and retaining successful workplace employment.

The conception and methodology described in this article offer further opportunities for application. Since work-based values are applicable in all areas of preparing students for employment, the ideas could be applied across both general and technical and vocational curriculum streams, including apprenticeships, and could even be incorporated through work-based values programmes offered to lecturers and teachers for continuing professional development.

In our view, the work-based values approach put forward in this article has the potential to equip young people with the personal capability to negotiate relationships in the workplace and, as a result, improve their employability. This is a missing link in current thinking that, in our view, can be meaningfully resolved through the use and further development of valid and reliable work-based values assessment instruments such as those presented in this article.

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Knowledge, competencies and dispositions of lecturers in Technical Engineering in the context of advancing 4IR technologies

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ABSTRACT

The advent of the Fourth Industrial Revolution (4IR) affirms that the transformation and advancement of all industries and society are progressively driven by emergent and rapidly changing technologies. In order to help establish a technologically literate society, it is crucial for lecturers in Technical Engineering to stay abreast of the latest trends and technological advancements in their area of specialisation. This article reports on the findings of a sub-section of a nationwide survey that collected data from lecturers in Technical Engineering at 52 TVET college campuses across South Africa (n = 577) that offer TVET Engineering Study programmes. The purpose of the survey was to profile TVET Engineering Study lecturers' knowledge and pedagogical practices in engineering programmes across South Africa. The sub-section of the survey specifically probed the participants' awareness and understanding of discipline-specific technological advancements and digital educational enterprises, and also the potential impact of these on teaching technical subjects. The findings show that 52,3% (n = 302) of the participating lecturers in Technical Engineering are unaware of any technological advancements in their area of specialisation and that they do not know what the potential impact of this might be on future technical training. When Engeström's Cultural Historical Activity Theory (CHAT model) is applied to the activity systems that are involved, the underlying tension between these systems is revealed. This article examines the possible implications of these findings for the renewal of the Technical Engineering curriculum, considering that these lecturers demonstrate limited awareness of the technological advancements needed to participate effectively in the 4IR era.

Orientation and problem statement

> The world is on the brink of a technological revolution that would fundamentally alter the way we live, work and relate to one another. In its scale, scope and complexity, transformation would be unlike anything humankind has experienced before (Schwab, 2016:np).

Technological development and industrial growth are increasing at an exponential rate, with expanding global applications driven by the rapid development of emerging and enabling technologies (Brophy, Klein, Portsmore & Rogers, 2008). Mbanga and Mtembu (2020) note further that even though TVET lecturers perceive the incorporation of digital tools in teaching and learning practices as convenient and useful, training is required to implement the relevant technologies effectively in classes. The 4IR refers to the ongoing automation of traditional manufacturing, production and industrial practices through the digitalisation, interconnectivity and communication of systems, using the internet and other emerging smart technologies (Erboz, 2017; Graube & Mammes, 2018; Nundkumar & Subban, 2018; Philbeck & Davis, 2019). In Germany, the term *Industry 4.0* is used synonymously when referring to the 4IR, the United States prefers *Industrial Internet Consortium*, whereas in Japan and Asia the term used is the Industrial *Value-Chain Initiative (IV-I)*. However, according to Philbeck and Davis (2019:17), *Industry 4.0* refers to a specific component within the larger concept of the 4IR, which focuses specifically on the relationship between digitisation, organisational transformation and productivity enhancement in manufacturing and production systems. The 4IR 'affirms that technological change is a driver of transformation relevant to all industries and parts of society' (Philbeck & Davis, 2019:17). The emerging transformation of cyber-physical systems that were brought about by disruptive emerging digital technologies, through the *Internet of Things, the Internet of Services, and the Internet of Industrial Things*, gave rise to the 4IR (Schwab, 2016; Winston, 2017):

> Large-scale integration of machine-to-machine communication (M2M), Smart technologies, and the Internet of Things, drastically increased the automation of industries through improved communication and self-monitoring, and Smart machines that can analyse and diagnose issues without the need for human intervention (Moore, 2019:np).

The 4IR is increasingly connecting a diverse range of emerging technologies in order to create value not only for industries, but for all aspects of human life.

Literature review

Cyber-physical system (CPS) design architecture

There has been a significant shift in advanced economies from manufacturing to services driven by information and technology (ICT). Industrial and manufacturing processes are being automated aggressively, owing to the growing capabilities of cyber-physical systems which progressively monitor, control and make independent decentralised decisions (Erboz, 2017). The global enforcement of social-distancing regulations in response to the tenacity of the ongoing COVID-19 pandemic has accelerated the automation of industries even more (Marr, 2020). Yokogawa (2021:np) postulates various levels of industrial automation, ranging from the lowest level of autonomy, in which all industrial and manufacturing processes are still manually controlled by human beings, to the highest level of symbiotic autonomy, in which autonomous operations of multi-collaborating ecosystems are brought together via the Industrial Internet of Things. These industrial transition stages resemble the two phases of the technological revolutions: the Industrial Automation stage dominated by a Third Industrial Revolution (3IR) technology interphase and an Industrial Autonomy stage (4IR). We argue that the shifts from manually controlled manufacturing and production processes to the autonomous operation of multi-collaborating ecosystems are critical to the knowledge lecturers in Technical Engineering need for the development of industry-relevant curricula.

The rapid digitisation and automation of industries, however, has also brought new challenges for future labour markets and technical education and training. Automated systems are constantly raising the complexity of tasks, which in turn demand incessantly higher levels of skills for entry-level positions (Makgato, 2019). Another concern, raised by Shusterman (2015), is that many education and training institutions are currently educating and preparing students for obsolete occupations and work for which human activities are no longer required; this is due to the continuous digital automation and transformation of industries. Makgato (2019:390) voices the same concern:

> Youth and people who lack high level technological and interpersonal skills are becoming vulnerable due to digital automated jobs. There is a need for targeted and strategic skills, education and training that are responding to the changing technological world … supporting the application of transferable skills will be a key priority as we foster a sustainable and more productive economy.

A technology- and knowledge-driven economy requires a well-trained workforce coupled with cutting-edge industry-based knowledge and skills in Science, Technology, Engineering and Mathematics in order to sustain the growing and ever-changing demands brought about by the digital transformation of industries. In his 2019 State of the Nation Address, President Cyril Ramaphosa remarked:

The world we now inhabit is changing at a pace and in a manner that is unprecedented in human history. Revolutionary advances in technology are reshaping the way people work and live. They are transforming the way people relate to each other … we are faced with a stark choice. It is a choice between being overtaken by technological change or harnessing it to serve our developmental aspirations. It is a choice between entrenching inequality or creating shared prosperity through innovation … To ensure that we effectively and with greater urgency harness technological change in pursuit of inclusive growth and social development (South Africa, 2019:np).

TVET colleges, as 'significant and necessary participants' in the 4IR (Nundkumar & Subban, 2018:309), have aspired to fulfil these demands. Nzimande (DHET, 2017) acknowledges the 4IR as an opportunity to speed up economic development and advance skills for industrialisation, and mandated TVET colleges to produce individuals who can embrace the change brought about by technology.

In his 11 February 2021 parliamentary reply to a question raised in the National Assembly, Minister Nzimande (2021) reported:

Since 2018, the Department has embarked on a plan to review and update programmes and qualifications offered at Technical and Vocational Education and Training (TVET) colleges in order to align them with the needs of industry and society.

New programme development

The Department of Higher Education, Science and Innovation (DHESI), supported by CISCO Systems, Inc., a US multinational technology conglomerate,

developed digital skills training, which has been integrated into the National Certificate (Vocational) [NCV] programme. The new programme stream focuses on Robotics in the NCV: Information Technology and Computer Science programme, which previously focused on programming and systems development only. This stream will cover subjects such as *Electronic and Digital concepts for Robotics*, *Robotics Fundamentals, and Industrial Automation*. The curriculum for this programme is currently being quality assured by *Umalusi* and is envisaged for implementation in 2022 (Nzimande, 2021).

The DHESI further collaborated with the Quality Council for Trades and Occupations (QCTO) in reconstructing curricula for Engineering Studies programmes to align them with industry needs and the standards of professional bodies. The programmes that have been prioritised and are currently being reconstructed are those in the following fields: Electrical Engineering, Electronics Engineering, Mechanical Engineering and Civil Engineering. The

curriculum reconstruction of the engineering programmes commenced in August 2020 and it is anticipated that it will be completed by June 2021. The completion of this process will see a reduction in the offering of the current National Accredited Technical Education Diploma (NATED) programmes and a shift to occupational programmes which are more industry-aligned. Since 2018, the curricula of 38 subjects in the NATED programmes covering Engineering, Business and Services studies have been updated. The implementation of these revised and/or updated curricula started in January 2021 (Nzimande, 2021). The minister appealed to the management of Higher Education Institutions (HEIs) 'not to compromise standards in offering … engineering programmes', and furthermore expressed his

> trust that those who are appointed to teach in these qualifications also hold the best qualifications in the engineering disciplines and command the best experience from related industries (Nzimande, 2020:np).

He also called upon

> industries … to rally resources together … [to] invest in the development of engineering infrastructure at … [HEIs] and provide good experiential learning opportunities for students who will be pursuing their engineering qualifications (Nzimande, 2020:np).

In order for lecturers in Technical Engineering to be able to 'command the best experiences from related industries' and to 'provide good experiential learning opportunities for students', they need to keep abreast of the latest trends and technological advancements in their fields of specialisation.

Professional development

Lecturers in Technical Engineering are mandated to be experts in their fields of specialisation and to mediate effectively the professional development of their novice students (DHET, 2013). This should be done in order to gain not only theoretical knowledge, but also the applicable digital skills and hands-on technological capabilities that industries will require of them. Even so, until recently, almost nothing was known about the level of awareness lecturers in Technical Engineering at TVET colleges had either of industry-relevant technological advancements in their areas of specialisation or about their knowledge and practical skills in the pedagogical use or/and application of those technologies (Teis & Els, 2021). Mbanga and Mtembu (2020) have noted further that even though lecturers at TVET colleges perceive the incorporation of digital tools in teaching and learning practices as convenient and useful, they require training in implementing the relevant technologies effectively in classes. It is also unclear whether or not these lecturers are actually considering the transformative impact that emerging technologies will have on their teaching practices in future. Accordingly, this article reports on the empirical findings of a sub-section of a national survey that are informative in finding answers to these unresolved questions.

In order to create and mediate industry-relevant learning opportunities for students in technology-integrated learning environments, it has become essential for lecturers in Technical Engineering to:

- make the pedagogical shift from a transmission-based approach to a transformative-based pedagogical approach in which technology is interwoven and used as a tool to mediate 21st-century discipline-specific transformative learning experiences;
- integrate industry-relevant technologies and digital competencies progressively into their pedagogical practices in order to achieve 21st-century learning outcomes.

Drawing on the available corpus of knowledge, these essential requirements are explored in the next section because they constitute the theoretical underpinnings of the research component (i.e. a sub-section of a larger national survey study), the findings of which are reported on in this article.

Theoretical underpinnings

Continuous professional development of technological literacy and digital competencies

Twenty-first-century skills are the abilities required in order to be effective workers, citizens and leaders in the global economy (Madhav, Simelane-Mnisi, Hardman, Dlamini & Lilley, 2018). The shift towards an autonomously operating multi-collaborative ecosystem is characterised by a decentralised decision-making, information-sharing, teamwork and innovation-driven process (Binkley, Erstad, Herman, Raizen, Ripley, Miller-Ricci & Rumble, 2012). These perspectives imply that people need to know how to use their acquired skillsets by thinking critically, applying knowledge to new situations, analysing information, comprehending new ideas, communicating, collaborating, solving problems and making decisions (Partnership for 21st-Century Skills, 2008). Anyone familiar with the literature of technical education over the past decade should agree that a shared and deeper understanding of technological literacy as the intended outcome of education in Technical Engineering has proved to be unexpectedly complex. According to Dakers (2018:23), being technologically literate

> is something that one never actually becomes. One is, rather, always in the process of becoming, just as technologies are always in the process of becoming.

Digital competencies, as a component of technological literacy in the 4IR era, cannot be assessed in terms of right or wrong: one is always in the process of becoming more technologically literate and more digitally competent (Dakers, 2018:23). Furthermore, technological skills are not the defining factor for effective digital pedagogy. Effective digital pedagogy is much more about an attitude towards and an aptitude for digital technologies than having certain predetermined technological skills. Digital pedagogy requires a willingness to use new technologies effectively in classes and to understand how and why they should be

used (Stommel, 2013; Burtis, 2016; Hardman, Molotsi, Lilley, Madhav, Simelane-Mnisi & Dlamini, 2018). Teis (2014:66) characterises learning experiences in a rapidly changing digital age as those

> that combine rigorous academic study and the excitement of discovery … supported by an intellectual stimulation of a diverse group of similar eager learners.

Mapotse (2014) supports such a focus on knowledge production in technical engineering in his call for technical education to adopt a critical approach to knowledge development, placing learners at the centre of the learning process.

Lecturers' knowledge of Technical Engineering

The Technological Pedagogical Content Knowledge (TPACK) model, first proposed by Koehler and Mishra (2006), forms a critical part of the Department of Basic Education's (2018) *Professional Development Framework for Digital Learning*. The TPACK model emphasises that 21st-century teaching has become a highly complex activity that embraces various kinds of knowledge. The TPACK model is an effective tool for advancing these lecturers' thinking about teaching. De Miranda (2008), who argued further that teacher knowledge frameworks enable teachers to design the best learning experiences to teach, supports this view. A teacher's understanding of effective teacher knowledge frameworks could shift their focus from *what to teach* to *an understanding of the discipline-specific strategies* to bring about the best learner experiences in a coherent manner. The TPACK model could serve as a tool to illuminate the complex interplay of various types of knowledge that lecturers in Technical Engineering need to acquire and integrate as part of their 21st-century pedagogical practices (Hardman et al., 2018). We demonstrate these complexities in Table 1 below, through an analysis of the required teacher knowledge frames and thinking skill taxonomies. Table 1 outlines the critical models of knowledge that Technical Engineering lecturers must possess in advanced technological teaching environments.

Table 1: Linking lecturers in Technical Engineering SAMR (Substitution-Augmentation-Modification-Redefinition) levels of technology integration (Puentedura, 2006; 2014) with Bloom's (1956) Revised Digital Taxonomy (Anderson & Krathwohl, 2000), in order to mediate the development of higher-order thinking skills among students of Technical Engineering (adapted from Puentedura, 2006; 2014)

← **Progressive development of lower-to higher-order thinking skills**

|	Levels of Technology Integration	Pedagogical use of technology	Bloom's Revised Digital Taxonomy	Mediation of engineering students' development of thinking skills
TRANSFORMATIONS	Redefinition	The task is altered so fundamentally by the technology that it cannot be done without the technology. The use of technology enables the accomplishment of tasks that were previously inconceivable	Create	Designing, constructing, planning, producing, manufacturing, inventing, devising, programming, animating, broadcasting, filming, publishing
TRANSFORMATIONS	Modification	Technology is used to accomplish learning outcomes. The teaching and learning process is transformed by the use of technology. The task alters functionally in the presence of the technology. Technology allows for significant task redesign. Further integration: redesign the task with the use of technology	Evaluate	Experimenting, hypothesising, testing, monitoring, critically evaluating, reviewing, posting, moderating, virtually collaborating and networking with experts in the field
			Analyse	Comparing, organising, deconstructing, attributing, outlining, finding, structuring, integrating, linking, validating, cracking, reverse engineering
ENHANCEMENT	Augmentation	Appropriate tools are used to enhance reaching and learning. Further integration: learning task is slightly altered to augment work that is usually done in a traditional way. The task is functionally improved by the use of technology	Apply	Implementing, carrying out, using, executing, loading, playing, operating, hacking, uploading, sharing, editing
			Understand	Interpreting, summarising, inferring, paraphrasing, classifying, catagorising, comparing, explaining, exemplifying, advanced searching, Boolean searches, blogging, tagging, commenting, annotating
ENHANCEMENT	Substitution	Technology is still used in the same way as was done in 20th century. Further integration: replace a traditional tool or technology with an emerging technology in such a way that the learning task is not functionally altered, i.e. the technology acts as a direct substitute for a tool with no functional change	Remember	Recognising, listing, describing, identifying, retrieving, naming, locating, finding, bulleting, pointing out, highlighting, bookmarking, social networking, social bookmarking, local bookmarking, Googling

← **Progressive levels of technology integration**

Pedagogical integration and use of industry-relevant technologies by lecturers in Technical Engineering

The levels of integration of technology proposed by Puentedura's (2006; 2014) *Substitution-Augmentation-Modification-Redefinition (SAMR)* model offer lecturers in Technical Engineering the opportunity to self-evaluate and determine their progressive levels of pedagogical technology integration, that is, from the lowest *Substitution* level, to *Redefinition* as the highest level of integration (first two columns of Table 1). The SAMR model could help these lecturers 'to consider how to take full advantage of the benefits of emerging technologies' (Hardman et al., 2018:27). The first two integration levels, *Substitution* and *Augmentation*, denote the enhancement of teaching and learning through the use of technology; whereas the third and fourth levels of integration, *Modification* and *Redefinition*, epitomise the tangible transformation from traditional to 21st-century technology-integrated teaching and learning practices (Puentedura, 2006; 2014). The second column in Table 1 describes the integration criteria for each of the progressive levels of pedagogical technology integration. Bloom's (1956) Revised Digital Taxonomy (Anderson & Krathwohl, 2000) is incorporated into the third and fourth columns of Table 1, representing progressive levels of cognitive development, from lower- to higher-order thinking skills. The assimilation of these two models links the lecturers' progressive levels of pedagogical technology integration to their students' progressive development of lower- to higher-order thinking skills (Puentedura, 2006; 2014). Therefore, Table 1 offers a valuable framework for lecturers in Technical Engineering to use in order to plan, evaluate and align their teaching strategies and learning outcomes relative to their levels of technology integration.

Activity system of Technical Engineering lecturers' pedagogical practices

The Cultural-Historical Activity Theory (CHAT) is a third-generation expansion of Vygotsky's (1978; 1986) cultural-historical theory legacy in which culture and tools play important roles in human development and education. Vygotsky (1978) found that cognitive development can be achieved through a learning process provided that teaching is directed at this development. This teaching approach (Vygotsky, 1978; 1986) involves actively guiding a student's problem-solving through 'mediation', that is, a structured process in which the mediator (expert teacher/lecturer) is more competent than the novice student. What begins as a social relationship between the 'expert' and the 'novice' turns inwards and becomes owned by the novice. This process occurs only in a specific developmental space called the 'zone of proximal development' that opens up between the expert and the novice. This zone represents the difference between what a novice can achieve on their own (actual development) and the novice's potential level of development – what the novice can accomplish with the assistance of the expert (Hardman et al., 2018:11). Leont'ev (1978; 1981), a co-worker of Vygotsky's, developed the Activity Theory, which distinguishes between three levels of human activity: operations, goal-directed actions and motives. Developing the ideas of both Vygotsky and Leont'ev, Yrjö Engeström (1987; 1995; 1999; 2001; 2007) developed Cultural-Historical Activity Theory (CHAT). CHAT can be used to analyse human actions and interactions

within activity systems that are mediated by tools, which in 21st-century technology-integrated learning environments includes all the digital devices and forms of electronic information that can be used to achieve learning outcomes (Murphy & Rodriguez-Manzanares, 2007). Vygotsky's CHAT model could be used as an analytical tool or lens to explain the possible tensions between the current offerings in TVET Technical Engineering versus the advancing 4IR technologies.
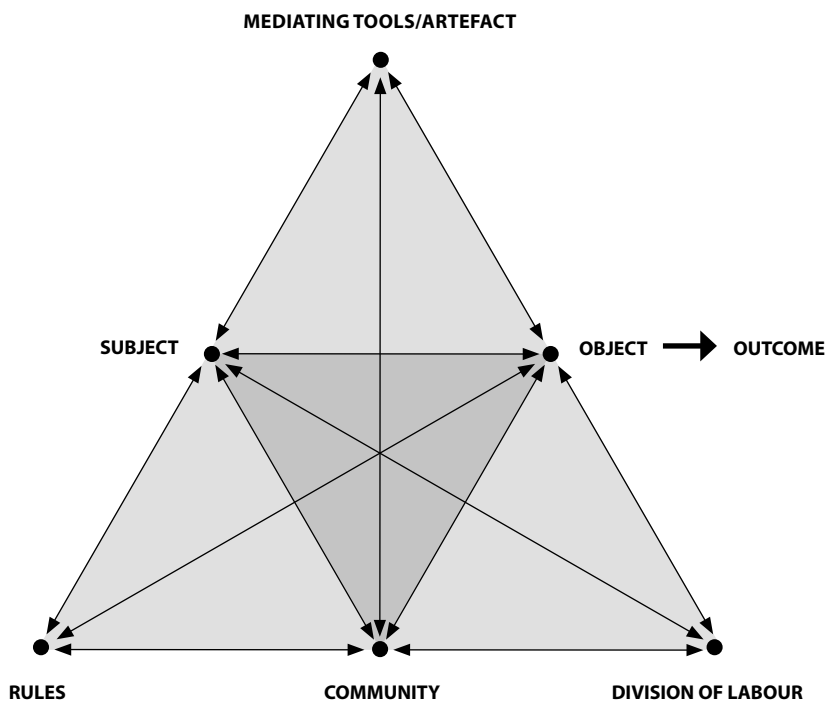
Figure 1: Engeström's (1999; 2001; 2007) 3rd generation Cultural-Historical Activity Theory (CHAT)

Figure 1 illustrates visually Engeström's (1999; 2001; 2007) CHAT model, which consists of various component nodes: subject, object, community, mediating tools/artefacts, rules and division of labour. The activity system dynamics of lecturers in Technical Engineering TVET pedagogical practices are illustrated in Figure 2.

MEDIATING TOOLS/ARTEFACT

Aspects of industry-relevant 4IR technologies and digital tools used to mediate the professional development of Technical Engineering TVET students

OBJECT

Problem space in which action is directed and transformed to mediate the professional development of Technical Engineering students with cutting-edge industry-relevant knowledge, technological skills and digital competencies

SUBJECT

Technical Engineering TVET lecturers

OUTCOME

For the TVET College to yield Engineering professionals with cutting-edge industry-relevant knowledge, technological skills and digital competencies, to fulfil the needs and demands of rapidly changing and digitally transforming 4IR industries

RULES

Both explicit and implicit norms and rules understood by the community

COMMUNITY

Technical Engineering TVET lecturer and students

DIVISION OF LABOUR

Roles and relative status of community members

Figure 2: Activity system dynamics of lecturers in Technical Engineering pedagogical practices

An activity is embedded in a surrounding system: for example, the integration and use of industry-relevant technologies are embedded in the activity system of lecturers in Technical Engineering as they integrate technology in the pedagogy that plays out in the classroom. This, in turn, is embedded in the activity system of the TVET college as a whole. Within these embedded systems, the cultural life of the TVET college (or other settings) is developed and maintained. According to Leont'ev (1978; 1981), the central focus of the community's activities within an activity system is to achieve the object effectively using various kinds of mediating tools and artefacts – for example, emerging and advancing 4IR technologies and digital applications that are relevant to industry. It is important to recognise and define clearly the object of an activity system; however, it is not necessarily always required for all participants in an activity system to be fully aware of the object. For example, it is not necessary for students in a Technical Engineering classroom community always to be aware of the object of their lecturers' pedagogical practices. However, it is important for the subject (i.e. the lecturer) to identify the object clearly and to define it (i.e. the professional development of students with innovative industry-relevant 4IR technological and digital competencies). According to the identified and defined object, all the pedagogical activities in the activity system are directed towards attaining the mediation of technological tools and digital applications.

According to Engeström (1987) and Leont'ev (1978), a central concern of their work is the conceptualisation of expansive learning – the capacity to interpret and expand the definition of the activity's object and to respond to it in increasingly enriched ways. In this regard, Daniels (2004:190) maintains that 'objects should not be confused with goals. Goals are primarily conscious, relatively short-lived and finite aims of individual actions'.
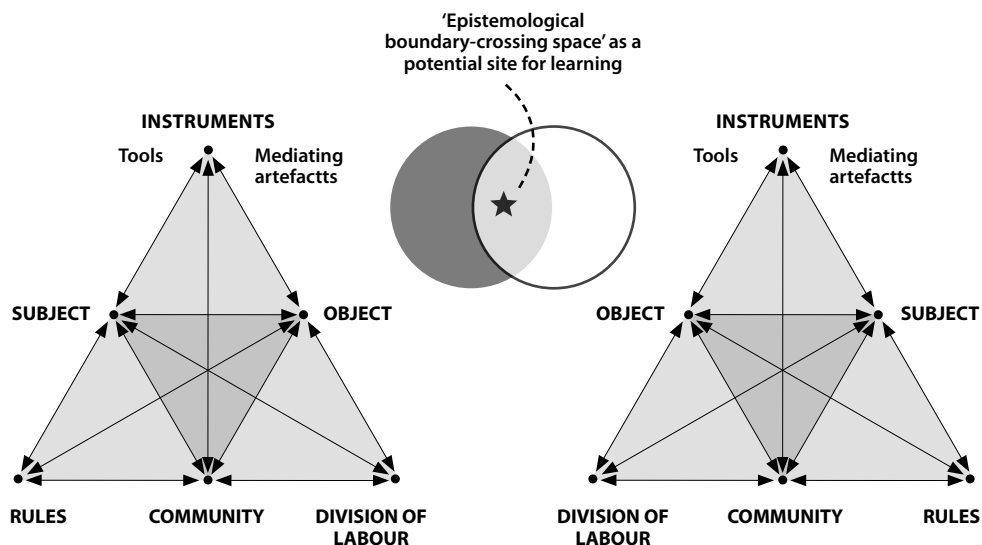
Figure 3: Epistemological boundary-crossing space between activity systems is a potential site for learning (own elaboration)
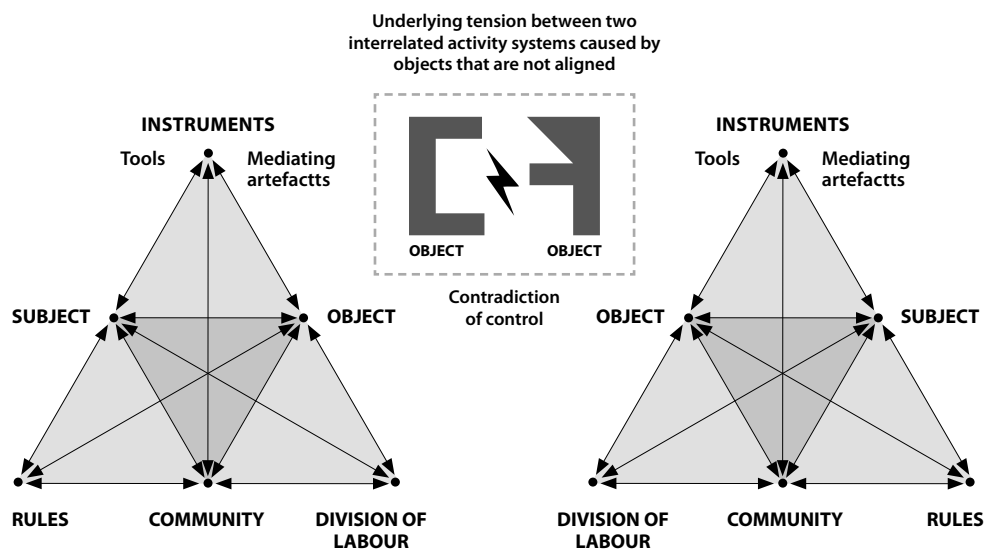
Figure 4: Underlying tension builds up between two juxtaposed activity systems when their objects are not aligned, causing a contradiction of control (own elaboration)

According to Engeström (2007), a researcher should always use two interdependent activity systems as a minimal unit of analysis. When the objects of two activity systems align – for example, if a lecturer and a student share the same objective – it creates an epistemological boundary-crossing space as a potential site for learning (see Figure 3). However, when the objects of two interdependent activity systems are not aligned, it creates underlying tensions and conflict owing to a *contradiction of control* (see Figure 4). Such tension might hinder lecturers in Technical Engineering in integrating 4IR technologies successfully in their pedagogical practices.

Researchers and lecturers can use CHAT to explore and evaluate the inner dynamics of various activities and processes within the activity system of lecturers' pedagogical practices, mediated through industry-relevant technologies and technological applications. What is not clear is whether lecturers in Technical Engineering are responding effectively to the exponential digital transformation of industries brought about by 4IR by continuously upskilling their technological skills and digital competencies. Therefore, this article reports on the empirical findings of a national survey that collected data from lecturers in Technical Engineering at 52 TVET college campuses across South Africa (n = 577) that offer TVET Engineering Study programmes. The purpose of the survey was to profile the lecturers' knowledge and pedagogical practices in Engineering programmes across South Africa. The findings reported on in this article have been derived from a sub-section of the survey that specifically probed participants' awareness and understanding of discipline-specific technological advancements and digital educational enterprises, and also the potential impact of these on teaching technical subjects.

Research design and methodology

Profiling lecturers in Technical Engineering across the South African TVET landscape

This article reports on selected findings from a research initiative (Teis & Els, 2021) that was mandated by the South African Department of Higher Education and Training (DHET) and funded by the European Union (EU). The overall purpose of this large-scale survey study was to determine the national profile of lecturers in Technical Engineering at TVET colleges across South Africa's TVET landscape. The survey instrument collected the following categories of information from the participants in order to derive a comprehensive demographical profile of these lecturers empirically:

- demographic information (e.g. gender, age group, programmes, employment status);
- teaching qualifications and subjects taught;
- teaching and industry-based work experience;
- work-integrated learning (i.e. industry-based and school-based);
- professional development; and
- awareness, knowledge and competencies in the practical use and/or application of industry-relevant technological advancements in their fields of specialisation.

Selected empirical findings from only the first and last of these information categories are reported on in this article.

Research design and method of data collection

A descriptive cross-sectional research design was used for this quantitative investigation and the data were collected over a period of 26 months (July 2017–August 2019) from a random sample of lecturers (n = 577) in Technical Engineering on 52 campuses of 24 TVET colleges across all nine provinces of South Africa. A quantitative method of data collection was used, that is, a structured survey instrument. Cross-sectional research determines the 'characteristics in a population at a certain point in time' (Cherry & Gans, 2019:np), 'with a defined start and stopping point' (Fleetwood, 2020:np). It allows researchers to amass a great deal of information from a large sample of participants, for example, by means of a survey. Accordingly, a descriptive cross-sectional research design was followed to respond effectively to the DHETs mandate to determine a recent national profile of lecturers in Technical Engineering across the country's TVET colleges.

Development of the survey instrument

A structured survey instrument was purposively developed to collect empirical data for the profiling of TVET lecturers in Technical Engineering. The development of the survey was informed by the following:

- existing educational policies and policy frameworks;
- the available corpus of knowledge pertaining to TVET research in South Africa;
- discourses on TVET professional development; and
- research team members' participation in prior provisional development research projects.

Ethical considerations

Ethical clearance was obtained from both the UFS Research Unit (UFS-HSD2017/1487) and the DHET. Research applications were submitted to the principals of TVET college campuses and formal permissions were obtained from these colleges to administer the survey on their campuses. An informed consent letter was sent out to lecturers in Technical Engineering at all TVET college campuses. Participation in the survey study was anonymous and voluntary. The participants were treated with respect and were informed about their right to withdraw from the research process at any time or stage.

Data collection

The research team engaged with regional TVET college management and lecturers in Technical Engineering in order to contextualise and plan the data-collection process – access, availability and participation – to ensure that both the data would be collected according to

high ethical standards and that data collection would not interfere with or disrupt the normal academic activities at the TVET colleges. Data collection started in July 2017 and ended in August 2019. Arrangements were made for a suitable date and time to administer the survey on each campus. Participating researchers were identified to administer the survey on the various TVET campuses to the lecturers and to submit the completed surveys, signed consent forms and attendance registers to a central office at the University of the Free State. The survey responses of the lecturers were captured digitally in a combined quantitative dataset and were prepared for statistical data analyses.

Statistical analyses

The statistical software SPSS® was used to calculate both descriptive statistics (frequencies and frequency percentages), as well as inferential statistics (cross-tabulations) on the combined dataset. However, for the purposes of the current discussion, only the descriptive statistical findings are reported on in this article.

Demographic information of the sample

In total, 850 surveys were distributed to lecturers in Technical Engineering on 52 campuses at 24 TVET colleges across all nine provinces of South Africa. A random sample of lecturers (n = 577) completed the survey instrument successfully, signifying a survey return rate of 67,88%.

Provincial distribution

The province most represented in the total sample (n = 577) of the participating lecturers in Technical Engineering was the Western Cape (n = 105 participants, i.e. 18,2% of the total sample); the province least represented was the Northern Cape (n = 42 participants, i.e. 7,3% of the total sample).

College distribution

Among the TVET colleges (n = 24) that participated in the survey, the TVET college in KwaZulu-Natal is the most represented by participants (n = 85, 14,7% of the total sample), whereas the TVET college in the North West province is the least represented (n = 5 participants, i.e. 0,9% of the total sample).

Gender distribution

The gender distribution of the total sample (n = 577) is 74,7% (n = 431) males and 23,7% (n = 137) females, which are similar to the gender distribution percentages reported by merSETA (2019:25) for the manufacturing sectors: 76% male and 24% female. It is evident from the clear similarity of the gender distribution percentages in both studies that the size

of the current study's random stratified sample was large enough for data to become saturated and to reflect adequately the larger South African population of TVET lecturers within the Engineering disciplines. It remains unclear why 1,6% (n = 9) of the total sample decided not to indicate their gender group. Gender identity and the gender-related issues of lecturers in Technical Engineering for the most part remain unexplored and require the attention of future research.

Age distribution

Most of the participants indicated that they were in the age groups 31 to 35 years of age (n = 105; 18,2% of the total sample) and 36–40 years of age (n = 103; 17,9% of the total sample). The age group least represented in the total sample are those lecturers who fall within the age range 25 years or younger (n = 10; 1,7%). Again, one could merely speculate about possible reasons why 2,8% (n = 16) of the total sample did not report their age group.

Distribution of teaching programmes

When the participants were asked to indicate the programmes they teach:

- 47,5% (n = 274) indicated the NATED as their first teaching programme;
- 35,5% (n = 205) indicated the NC(V); and
- 17% (n = 98) did not disclose their first teaching programme.

Furthermore, 13,5% (n = 78) indicated NATED and 17,9% (n = 103) Skills, as their second teaching programme, whereas 68,6% (n = 396) did not indicate a second programme, as most lecturers teach in only one of the three TVET programmes.

Digital skills training

As previously mentioned, the DHESI, supported by CISCO Systems, Inc., developed digital skills training, which has been integrated into the NC(V) programme (Nzimande, 2021). Approximately 36% (n = 205) of the total sample of participants indicated that they received digital skills training which has been integrated into the NC(V) programme. These exposures could support the department's introduction of new Robotics streams into the NC(V) programme in 2022 (Nzimande, 2021). Minister Nzimande (2021) furthermore anticipated a reduction in the offering of NATED programmes at TVET colleges, following the expected June 2021 completion of the curriculum reconstruction of Engineering programmes.

Empirical findings

The empirical findings from a sub-section of the survey that requested participants to self-rate their awareness of, knowledge of and competence in the practical use and/or application of industry-relevant 4IR technological developments or advancements are reported in this section.

Participants' self-rated awareness of 4IR technological developments within their areas of specialisation

One of the survey items requested lecturers in Technical Engineering to indicate specifically whether they are aware of any technological developments or advancements in their areas of specialisation.

Table 2:   Participants' self-rated awareness of 4IR technological developments or advancements in their areas of specialisation

AWARENESS OF TECHNOLOGICAL DEVELOPMENTS/ ADVANCEMENTS IN THEIR AREA OF SPECIALISATION	FREQUENCIES (N)	FREQUENCIES (%)
Unaware of any technological developments/ advancements in their area of specialisation	302	52,3
Aware of any technological developments/ advancements in their area of specialisation	217	37,6
Did not indicate	58	10,1
Total sample: **n =**	**577**	**100,0**

Of the total sample (n = 577), 37,6% (n = 217) indicated that they were aware of technological developments or advancements in their areas of specialisation and 52,3% (n = 302) indicated that they were unaware of any technological developments or advancements (see frequency Table 2). Awareness could contribute towards their professional development of the technological literacy and digital competencies that are required for 21st-century technology-integrated learning environments that are industry-relevant.

The next survey item requested the participants to *Please specify any three of these technological developments in your area of specialisation that you are aware of.* Table 3 shows randomly selected examples (n = 76) of some of the technological developments that lecturers in Technical Engineering specified as 4IR technologies in their areas of specialisation in response to the survey item. Correctly specified 4IR technological developments are shaded in Table 3.

Table 3:   Random examples of some of the 4IR technological developments in their areas of specialisation that lecturers in Technical Engineering specified

3D Printers	GPS
Alternating current (AC) motor drives	Hydraulics
Advanced ARC welding	**In computer-aided manufacturing and 3D**
Air-conditioning	**Integration of automation devices**
Artisan training	Internet

Assessors	Isolators
Auto-electrical qualification (Trade test)	Joint and termination
AUTOCAD Software integration and training	Knowledge of other languages (e.g. Mandarin) used in equipment
Automation, mechatronics, robotics, diagnostics, troubleshooting	LED lighting systems
Blended learning	Linux operation systems
Boilermaker specialist	Machining, phoning and videos
Brakes, brakes by wire, braking systems	**Mechatronics (Automation)**
Change of natural standards	Microsoft Word
Chemical	Moderator course
Cloud	New pipes, new pipe fittings
Component development	New trade test for electricians
Computer	Plumbing
Computer-based fault-finding rather than manual/human fault-finding	Pneumatics
Computer skills and machine exposure	Power steering
Computerised programs	Power tools
Curriculum change in artisan development	Project management
Daylight switches	Quantity surveyor
Design methods	**Remote operations**
Development	Renewable energies – solar and wind
Development and implementation of electrical power systems simulators	Schematic hydraulic circuit on computer
Digital electrical measuring instruments – kWh meters	Sequence starters
Drain camera	Setting of question papers
e-Books	**Smart electrical grids**
Education technology	Soldering techniques
e-Learning	Spreadsheet
Electrical	Steering and accelerator shaft and pedal development
Electrical and diagnostic advancement software	Surveyor land total station
Electricity	Test equipment – oscilloscope

Emission control systems	Toilet that uses sense devices
Energy recovery braking systems	Twizza soft drinks
Fibre concrete	Unit standards need to be revisited for the sake of relevancy
Film and media studies	Water-based paints
Geysers	Woodwork –kitchen installations

Although 37,6% (n = 217) of the total sample of participants indicated that they were aware of technological developments or advancements in their areas of specialisation (see Table 2), when asked to provide actual examples of such technologies, only 17,12% of the examples that participants provided in Table 4 were real examples of industry-relevant 4IR technological developments or advancements. It therefore seems as if the participants overrated their actual awareness of the technological developments or advancements in their areas of specialisation by 20%.

Participants' self-rated knowledge of the practical use and/or application of 4IR technological developments or advancements in their areas of specialisation

The survey also requested the participants to self-rate their knowledge of the practical use and/or application of 4IR technological developments or advancements.

Table 4: Participants' self-rated knowledge of the practical use and/or application of 4IR technological developments or advancements

SELF-RATED KNOWLEDGE ABOUT THE PRACTICAL USE AND/OR APPLICATION OF 4IR TECHNOLOGIES	FREQUENCIES (n)	FREQUENCIES (%)
Not at all knowledgeable	22	3,8
Not so knowledgeable	36	6,2
Somewhat knowledgeable	99	17,5
Very knowledgeable	107	18,5
Extremely knowledgeable	24	4,2
Did not indicate	289	50,1
Total sample: **n =**	**577**	**100,0**

Of the total sample of participating TVET lecturers, 18,5% (n = 107) rated themselves as very knowledgeable about the actual or practical use and/or application of the technological developments or advancements, 4,2% (n = 24) rated themselves to be extremely knowledgeable, whereas 17,2% (n = 99) consider themselves to be somewhat knowledgeable (see frequency Table 4). Only 3,8% (n = 22) indicated that they do not have any knowledge about the actual or practical use and/or application of such technological developments or advancements,

whereas 6,2% (n = 36) consider themselves not so knowledgeable. Of the total group of participants, however, 50% (n = 289) did not respond to this survey question to rate their own knowledge in this regard.

Participants' self-rated competence in the practical use and/or application of 4IR technological developments or advancements in their areas of specialisation

Table 5: Participants' self-rated competence in the practical use and/or application of the technological developments or advancements

SELF-RATED COMPETENCE IN THE PRACTICAL USE AND/OR APPLICATION OF 4IR TECHNOLOGIES	FREQUENCIES (n)	FREQUENCIES (%)
Not at all competent	20	3,4
Not so competent	39	6,8
Somewhat competent	99	15,1
Very competent	107	18,5
Extremely competent	26	4,2
Did not indicate	279	48,4
Total sample n =	**577**	**100,0**

Concerning the participants' self-rating of their own competence in the actual or practical use and/or application of these technological developments or advancements (see frequency Table 5), 18,5% (n = 107) rated themselves as very competent and only 4,5% (n = 26) viewed themselves as extremely competent. Furthermore, 6,8% (n = 39) rated themselves as not so competent, while 3,5% (n = 20) indicated that they are totally incompetent in the actual or practical use and/or application of these technological developments or advancements. One could only speculate on a possible reason why 48,4% (n = 279) of the total number of participants (n = 577) refrained from self-rating their competence in the practical use and/or application of technological advancements in their areas of specialisation. However, considering that 48,4% of the participants disregarded this test item and that only 17,12% of the participants were able to provide examples of actual 4IR technologies in their fields of specialisation (see Table 3), the data seem to lean more in favour of surmising that such non-responses could indicate those participants' incompetence in the practical use or application of 4IR technological developments or advancements.

Conclusion and recommendations

This study supported the DHESI's current reconstruction of Engineering programmes offered at TVET colleges in order to align them with and make them responsive to the rapidly changing needs of industries. The exponential digital transformation and automation of industries brought about by the 4IR is increasingly raising the complexity of knowledge

and skills required for entry-level positions in industries. Consequently, lecturers in Technical Engineering are mandated to continually improve or update their knowledge and skills in the practical application of the latest industry-relevant 4IR technological advancements in their areas of specialisation; they are also required to integrate the technological advancements effectively into their pedagogical practices. These lecturers should become experts in their fields of specialisation in order to mediate their students effectively so as to develop, not only theoretical knowledge, but also the applicable digital skills and hands-on technological capabilities that industries will demand of them in entry-level positions.

In order to accomplish this, lecturers in Technical Engineering must shift their pedagogical approach from a transmission-based to a transformative-based approach in which technology is interwoven and used as a mediating tool to create 21st-century transformative learning experiences for their students in technology-integrated learning environments that are relevant to industry. Accordingly, this article provides guidelines for these lecturers on how to integrate industry-relevant technologies and digital competencies into their pedagogical practices progressively in order to achieve 21st-century learning outcomes. This article also shows how lecturers in Technical Engineering can progressively mediate the development of higher-order thinking skills and digital expertise in their Engineering students, relative to their respective levels of technology integration.

The DHET commenced the reconstruction of the curriculum for Engineering programmes in August 2020, a process that it is anticipated will be completed by June 2021 (Nzimande, 2021). As the fields of Electrical, Mechanical and Civil Engineering are being prioritised, the current curriculum reconstruction of Engineering programmes will directly affect 63,8% (n = 368) of the first subjects taught by the total sample of participants in the current investigation.

The management of TVET institutions for the most part seem reluctant to capitalise fully on the potential benefits and growth that could be gained from 4IR technology's fertile disruption and transformation of organisations and industries (Renjin, 2019). It is therefore not surprising that the empirical findings reported in this article show that, at the time of their participation in the national survey, 52,3% (n = 302) of the lecturers (n = 577) in Technical Engineering were unaware of any technological advancements in their area of specialisation, and also did not know what the potential impact of these might be on future technical training. Since their participation in the survey between July 2017 and August 2019, 35,5% (n = 205), some of the lecturers in the current investigation have received digital skills training, which has been integrated into the NCV programme (Nzimande, 2021). The findings reported in this article that relate to the lecturers' awareness of, knowledge of and competence in the practical use and/or application of industry-relevant 4IR technological developments or advancements offer a valuable point of reference for the DHESI against which to compare the effectiveness or success of the digital skills training that was implemented after August 2019 for lecturers in Technical Engineering in the NCV programme.

For their part, TVET colleges will have to invest in establishing the necessary infrastructure that is required for these lecturers to integrate industry-relevant 4IR technologies successfully into their pedagogical practices in technology-integrated learning environments. This will require them not only to invest in technology hardware and software, but also to provide applicable training opportunities for information technology (IT) staff and lecturers. Such training opportunities should enable them to integrate and use 4IR technologies effectively in order to deliver 21st-century industry-based learning opportunities to students. It is crucial that the management of TVET colleges and the lecturers share the same objective: the professional development of students of Technical Engineering so as to give them cutting-edge industry-relevant 4IR technological and digital competencies. Doing so should avert any underlying tensions between the two activity systems that could result from a contradiction of control.

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Why prisoners pursue adult education and training: Perceptions of prison instructors

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ABSTRACT

This study reports on a cross-sectional survey of prison instructors (educators and managers) in adult education and training centres in five South African prisons. The study attempted to understand their perceptions of what motivates prisoners to pursue further education. The research draws on Vroom's Expectancy Motivation Theory, which holds that behaviour is a result of deliberate choices from among alternatives in order to maximise pleasure and reduce pain. The semi-structured interviews conducted with ten prison managers and 11 educators revealed instrumentality motivation coupled with expectancy and valency motivation reflected in three major findings: first, that prisoners pursue adult education to improve themselves educationally and prepare for employment after their release; second, that prisoners seek to prevent a relapse into criminal activity and re-imprisonment and to prepare for a crime-free life; and, third, that learning takes their minds off their incarceration and kills time. These findings have direct implications for policy and practice as they suggest a need to support the fight against recidivism.

Introduction and background

This study is based on a national cross-sectional survey of Adult Education and Training (AET) centres carried out by a higher education institution in KwaZulu-Natal. The national survey was funded by the South African Department of Higher Education and Training (DHET) and the European Union (EU) through the Teaching and Learning Development Capacity Improvement Programme.

The survey investigated the perceptions of instructors in private, public and protected spaces (e.g. AET centres in prisons) in order to understand the courses offered; centre enrolments; educator numbers, qualifications, training needs and salaries; challenges centres face; and motivations for learner engagement in courses (Land, Mbamali & Mukeredzi, 2021).

The data for this article were drawn from those generated for the national survey and they are based on five AET centres in prisons in order to explore the perceptions of prison instructors (referred to as 'managers' and 'educators') about prisoners' motivations to learn.

The voices of the prisoners themselves are noticeably completely absent in this article, which is a limitation. However, this is due to the survey's terms of reference which required them to interact with managers and educators only, and not with inmates or learners. The article terms prisons or correctional centres as 'protected spaces' because these places are in essence protected, given the restrictive entry measures enforced for the security of the public, other prisoners and staff. It is the AET centres in these prisons that are targeted in this article.

In developing countries such as South Africa, research on adult education appears limited, particularly that on offenders pursuing adult education during incarceration. MacDonald (2018) compares extensive research in other education sectors with studies in adult education and laments the dire need for research in AET. Dean (2011) also bemoans the inadequate and ill-researched AET educators in South Africa, indicating that research on educator knowledge and skills is neglected. In addition, research on prisons – South Africa (see Ngabonziza, & Singh, 2012; Ndebele, 2013; Lindegaard & Gear, 2014; Mokoele, 2016; Nel, 2017; Masutha, 2018; Vuk & Dolezal, 2019) has tended to focus, among other factors, on such issues as reduction of recidivism; prison population; prisoner education levels; reintegration; prison gangsterism, idleness and misconduct; and violent acts and victimisation in prisons.

Prisoners' motivations for embarking on AET programmes have not been investigated, therefore the objective of this study was to understand, from the perceptions of managers and educators, what offenders' motivations might be for engaging in AET courses.

Literature review

Key and May (2019:15) point out that 'when prisoners enrol in classes, they are participating in a discourse that produces them as scholars not inmates, learners instead of threats, people

instead of numbers', which may contribute to good prison discipline. According to Chigunwe (2016), a Zimbabwean study shows that discipline developed through prison education during incarceration is carried through to their societies and into employment upon their release. The United Nations Office on Drugs and Crime (UNODC) (2015) indicates that providing diverse, constructive educational activities for prisoners is pivotal to the dynamic security of prisons. Dynamic security encompasses both physical and procedural security arrangements that allow prisoners to feel comfortable approaching prison staff before problems escalate. Therefore, if prisoners are fully and productively engaged in constructive educational activities as an essential component of their sentence plans, the prison is likely to be safer and more secure for everyone.

The South African Judicial Inspectorate for Correctional Services (JICS) contends further that education plays a major role in reducing violence and maintaining order, leading to a safer environment (JICS, 2016). Therefore, channelling prisoners' energies into positive activities becomes an essential element of dynamic security principles. To this end, all prisoners should be exposed to opportunities to develop themselves personally in education and/or job skills, inclusive of opportunities to deal with aspects of their psychosocial makeup which may have given rise to criminal activity (UNODC, 2015). Therefore, AET programmes may both improve security outcomes in correctional centres and contribute to the 'dynamic security' mediated by human factors.

Ngabonziza and Singh (2012) and Vandala (2019) concur that the profile of South African incarcerated people reflects poverty, illiteracy and social inadequacy according to social standards. Therefore, prison AET may be a tool for improving their level of education and enhancing their chances of employment and/or furthering their studies. This may eventually create future opportunities that build positive attitudes towards becoming productive members of society. In addition, education in protected spaces can make significant contributions to individual well-being, citizenship and social cohesion (Vandala, 2019).

Generally, the overarching motivation for prisoner education is to reduce offending behaviour – to help offenders to cease engaging in crime. But offender motivations for engaging in learning during incarceration are apparently still being debated (Vandala, 2019). There seem to be mixed perspectives on this aspect: for instance, in the United States, some scholars emphasise motivation related to a reduction in recidivism rates (Koo, 2015). In contrast, extensive speculation has it that inmates' motivation for correctional education is to enhance their education and facilitate their transformation into law-abiding and economically productive citizens, reducing recidivism rates as a result.

Key and May (2019:48–49) conclude that, on entering prison, inmates generally go through a process which Goffman has called 'mortification of the self', where they are

> … shaped and coded into an object to be fed into the institutional machinery. … ground down into lowly and homogenized status of inmate. … refashioned in state-issued

clothing and relegated to small living space shared by individuals of unknown history and status (Kay & May, 2019:48–49).

In other words, by cutting prisoners off from their loved ones and taking them out of their comfort zones, turning them into uniformed forces, forcing them into complacency and compliance, sharing a small space with people unknown to them, governments generally, and prison systems in particular, send out signals that prisoners no longer matter. On the contrary, protected-space classrooms convey opposite messages. Accepting inmates as students, artisans or tradesmen nourishes them by maintaining the 'Scholar' and 'Work' identities which provide alternatives to the dominant hegemony (Johnson, 2015; Key & May, 2019). This therefore suggests that prison education is far more than a tool for reducing crime.

Behan (2014) sets out four major motivations for prisoners' participation in educational programmes in protected spaces, one of which is that participating in educational programmes during imprisonment enables prisoners to use their time constructively while preparing for a productive life subsequent to their release. Behan's findings are consistent with South African studies: Bender (2018) and Quan-Baffour and Zawada (2012) concluded that learning helps to reduce recidivism if inmates are engaged in educational programmes in protected correctional spaces. These authors add that high rates of recidivism, which are approximately 95% in South Africa, lead to astronomical correctional costs. With the introduction of prison AET and other education programmes in South Africa, previous offenders may have an estimated 43% lower rate of returning to prison (Mokoele, 2016). Moreover, education programmes may develop the inmates and 'guarantee far-reaching implications for employment opportunities available for formerly incarcerated people, re-integrating them within society on release' (Mokoele, 2016:88). This motivation relates to another study of South African prisons by Johnson (2015), who concluded that educational programmes offered by the Department of Correctional Services (DCS) should be needs-based and aligned to employment opportunities, self-esteem and the proper rehabilitation of individual offenders.

In this regard, Davis (2017:76) indicates that every USD1 million invested in different approaches to incarceration prohibits 350 crimes whereas similar investment in prison education prevents 600 crimes. Educating offenders is consequently the single most effective crime-prevention strategy (Ewert & Wildhagen, 2011; Bhuller, Dahl, Løken & Mogstad, 2019). Supporting these views, Quan-Baffour and Zawada (2012) argue that education in protected spaces is a cost-effective means of crime reduction which also offers long-term gains across populations as ex-prisoners have better chances of employment. Long sentences may offer immediate benefits and short-term solutions, but offenders may emerge out of protected spaces with little or no hope of reintegration into their families and communities – upon re-entry into communities, they become time-warped, generally being unskilled and uneducated (Davis, 2017).

Generally, formerly incarcerated, poorly educated individuals often find themselves without any financial resources or social support structures following their release; they therefore

become more susceptible to relapsing into committing crime than to becoming reintegrated into families and communities (Ndebele, 2013; Davis, 2017; Vuk & Dolezal, 2019). Consequently, they find their way back into prison following a few years of release. In contrast, employment opportunities for formerly incarcerated individuals who engage in prison education programmes are often enhanced and re-entry into their families and communities is rendered smoother and generally more successful if they took classes in prison, as employment is one of the pivotal features for successful reintegration.

The second motivation, according to Behan (2014), relates to adopting learning as a coping strategy and a way of killing time while enhancing their endurance of life in the protected space. Coping generally involves processes and efforts to modify and/or alleviate responses or reactions to the effects of stress, which can be either behavioural or psychological.

The third finding was that engagement in prison studies takes inmates' minds off being in incarceration (Behan, 2014:24) with one prisoner quoted as saying that '[studying] made prison life more bearable, a lot more bearable'.

Fourth, studying offers inmates a welcome escape or break from protected space routines and helps them to adapt to their surroundings and way of life. Johnson (2015) adds that there are also beneficial prison arts programmes – poetry, writing, theatre and visual arts – that provide a gateway to further learning and serve to build confidence and self-esteem in prisoners. This is so because such education can give people a voice, open up doors to a better future and restore individuals' self-esteem and social competence.

Furthermore, while a prison education generally has the far-reaching potential to reduce recidivism, the benefits accrue not only after a prisoner's release. To those serving long sentences, education in protected spaces also offers the possibility of significant and life-changing gains. Often there is a profound reduction in gangsterism, violence and disciplinary infringements among prisoners who participate in prison education programmes. Lindegaard and Gear (2014) revealed the prevalence of violent acts among South African inmates associated with prison gangs. Gangs have apparently been viewed as a chief source of criminal acts and other acts of non-compliance inside protected spaces. Such misconduct in protected spaces has been explained as a consequence of high concentrations of lower-educated men with a criminal history (Lindegaard & Gear, 2014; Nel, 2017).

Davis (2017) found that incarcerated prisoners participating in prison education committed 75% fewer infractions than inmates who did not. In addition, Mokele (2016) and Quan-Baffour and Zawada (2012) concur that prison education disrupted racial and ethnic disagreements and barriers that often instigated prison tensions and violence in South African prisons. Such disruptions also foster appropriate relationships between prison staff and the incarcerated and radically promote inmates' self-image and confidence.

Drawing on Ndebele's study (2013), post-secondary prison education may positively influence prisoners' children and siblings, and strengthen the chances of breaking down intergenerational inequality and disrupting incarceration cycles. For some inmates, participation in education programmes may be viewed as a way of getting away from the prison regime and routines.

Key and May (2019) point out that some prisoners participate in AET in protected spaces as a process of transformation. When one enters prison, there is time to reflect on the past, the present and the future (Behan, 2014). Quoting one inmate, Behan (2014:24) said:

> … learning here is a significant part of a process of change, and of making good. It is an opportunity, one of the few ways I can think and try to make amends to society, to my victims. Yes, it is one of the few ways to make amends, some form of amends.

Therefore, learning becomes a transformative experience for the inmate through reflection, where transformation includes personality changes, changes in the organisation of the self, and simultaneous restructuring of individual mental schemes and patterns (Illeris, 2009).

South Africa has the largest prison population in Africa, with approximately 160 000 prisoners, and in this respect, it occupies position nine in the world (Ndebele, 2013; Keehn & Nevin, 2018). The country ranks 40th in the world for the rate of incarceration at 280 per 100 000 people; in addition, remand detainees make up 25.8% of the population (Keehn & Nevin, 2018). Of the 161 054 prisoners in 2016, only 11 649 were engaged in AET programmes (Mokoele, 2016). However, the motivations for such engagement were not known. South Africa's DCS offers both formal and non-formal courses encompassing AET, general education, further education and training, higher education and training, and computer-based learning (DCS, 2010). Also included are vocational and production courses that lead to accredited and certificated programmes that are intended to enhance prisoners' chances of finding employment when they re-join their communities and also reduce the stigma attached to having been an offender (Johnson, 2015). According to Johnson (2015), the DCS requires all adult inmates without a qualification at a Grade 9 equivalent to enrol for AET levels 1 to 4. Similarly, in the United States, Koo (2015) confirms that if at the time of incarceration inmates do not have a General Education Diploma (GED) (equivalent to Grade 9), they are required to enrol in adult basic education or for the GED. Astray-Caneda, Busbee and Fanning (2011) note that the most widely offered prison education classes are in Adult Education, Vocational Education and GED as experts consider these courses to have the greatest potential for yielding positive results. In this regard, the South African DCS emphasises the provision of AET, literacy classes and basic schooling as priorities for inmates (DCS, 2010).

From the literature discussed above, studies on prison education have been carried out in South Africa and elsewhere (see Quan-Baffour & Zawada, 2012; Behan, 2014; Johnson, 2015; Koo, 2015; Mokoele, 2016; Key & May, 2019), but these studies did not specifically investigate prisoner motivations for pursuing adult education during incarceration.

Theoretical framework

This article draws on Vroom's Expectancy Motivation Theory (Vroom, 1964), which suggests that a person's perception of an outcome will determine his/her level of motivation. This explains why individuals choose one behavioural act over another. Vroom argues that motivation in Expectancy Theory emanated from multiple functions of valence, instrumentality and expectancy (VIE), which are illustrated in Figure 1 and explained below.

Expectancy

As shown in Figure 1, expectancy relates to the belief that more or increased effort in a task will yield better performance: in short, working harder produces something better. In the context of this study, increased effort while participating in course modules will yield better performance.
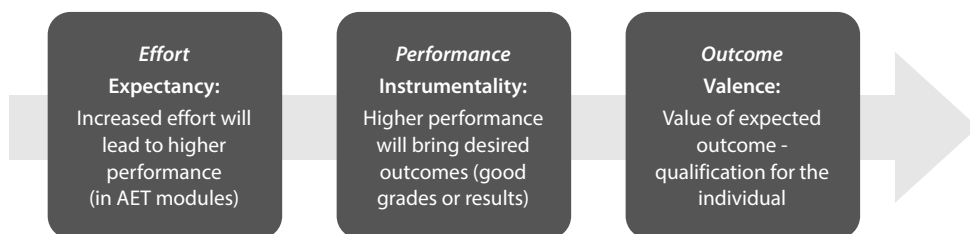
Figure 1: Vroom's Expectancy Theory (adapted from Vroom, 1964)

Therefore, expectancy motivation is an individual's momentary or short-lived belief which may be followed by a particular outcome or the certainty that an individual may feel that they can achieve (Vroom, 1964). Badubi (2017) concurs that belief and performance are influenced by support, resources, information and previous experience as well as confidence in the learner's capacities to bring skills to bear and influence outcomes (self-concept, self-efficacy, locus of control). Such factors are also effective in leading to success in adult learning and contribute to their expectancy towards success.

Instrumentality

Vroom (1964) defines instrumentality as the perception that better performance yields a valued outcome. According to Vroom, instrumentality is fostered by being clear on the

relationship between performance and outcomes, trust and respect for decision-makers, including transparency in the processes. In other words, instrumentality motivation is about an individual's perception of the likelihood that good performance will lead to a specific outcome or outcomes. It relates to individual beliefs or expectations that behaving in a certain way brings certain things about (Vroom, 1964).

Valence

According to Vroom (1964), valence means the value attached to or a belief in the desirability of the outcome. It is about the importance a person places on an expected outcome. In other words, this is about rewards. Valence motivation relates to affective orientations to particular outcomes and incentives.

In this study, Vroom's Expectancy Motivation Theory was used as a lens to interpret the data and to explain the findings.

Methodology

In this qualitative study, convenience sampling enabled the selection of available and accessible prison AET centres. The Institutional Research and Ethics Committee granted ethical clearance for the survey, whereafter the researchers sought consent from the National Head of all AET centres, including the head of protected spaces, the DHET and the centre managers. All the participants signed a consent form after being given a clear and detailed explanation of the study and what they were expected to do. Fieldwork took place between February 2018 and January 2020.

Data were generated from the five prisons through semi-structured interviews with ten centre managers and their deputy managers. Interviews lasted approximately one hour and were held in prison AET centres. The centre managers' data were complemented with the written narratives of 11 educators across the prisons. Educators' written narratives were generated during a residential learning session at the university in January 2020. Both managers and educators responded to the same questions that enquired about prisoner motivations for participating in AET programmes. Audio-recorded educator narratives were transcribed verbatim. Data analysis was accomplished through open coding. Using a non-participant colleague to check the dataset enhanced the trustworthiness of the data.

Each transcript was scrutinised for appropriate responses that depicted themes, enabling provinces, managers and educators to be represented suitably. Extracts from the data substantiated participants' stories of their perceptions of prisoner motivations for participating in AET programmes. Respondents were anonymised in the findings in order to protect confidentiality.

Findings and discussion

The study investigated perceptions of centre managers and educators with regard to inmates' motivations for engaging in AET. Prisoner motivations for participating in AET programmes emerged in three broad categories:

- improvement of education and preparation for employment;
- prevention of relapse into criminal activity and preparation for crime-free life; and
- taking the mind off incarceration and killing time.

In applying Vroom's theorisation (1964) as depicted in Table 1, it appears that while instrumentality was the most popular, expectancy and valency were also key, given that the improvement of educational level through AET was in preparation for employment, to prevent re-imprisonment and to prepare for a crime-free life. This is consistent with Vroom (1964), who points out that motivation occurs when three specific conditions – effort, performance and outcome – are met. In this case, motivation represents a chain where each link is a condition, and the intersection of each link represents the component's expectancy, instrumentality and valence. In the chain, an individual *expects* their effort to yield some level of performance (expectancy). The expected outcome of their performance is considered *instrumental* to the outcome (instrumentality). Finally, an individual places subjective *value* on their perception of the outcome (valence). This value therefore determines how satisfactory the outcome is to them. The following sections illustrate the findings on motivations in relation to VIE theorisation.

To improve education level and prepare for employment

All the participants perceived that inmates were pushed/pulled by VIE, which influenced their behavioural acts – to join AET programmes. The participants perceived that inmates wanted to improve their education levels and make up for learning missed before their incarceration. Drawing on Vroom's Expectancy Motivation Theory (Vroom, 1964; Guntoro & Fongmul, 2016), this reflected inmates' momentary beliefs that higher effort in the learning of AET would be followed by good performance or grades, which would lead to positive outcomes. This was coupled with valence motivation, where inmates seemed to value the potential rewards/outcomes associated with the specific results or behaviours, for example, obtaining a qualification and securing a job. As prison populations have low formal education levels (Vandala, 2019), the inmates embraced the opportunity to upgrade their education. They were motivated by the positive correlation between effort and performance and also desired outcome (Howard, 1989) and therefore chose behavioural acts which would uplift their education. As one of the participants explained:

> Some want to improve their education level, having missed for one reason or another outside prison (MP3).

Educator E5 wrote:

> They register to improve their literacy levels, to be better people after release.

This was elaborated on by MP4:

> Many see better learning opportunities here. They value education to break the cycle of incarceration for themselves and their families.

Educator E6 added:

> Some honestly say, without getting education here, you go out blind, having wasted time.

Educational improvement – expectancy, valence and instrumentality motivation for participating in AET programmes – was apparently important among inmates, given their low literacy levels.

In the views of participants, inmates understood their low level of education as having adversely affected their lives before imprisonment and that this would limit their employment opportunities following their release. Therefore, prison education would play an important role in developing and advancing their life skills vital for re-integration into communities.

All the centre managers and educators at AET centres in protected spaces in this study perceived that a strong pull/push factor in AET programmes was the expectation of employment after their release. E2 commented:

> Their aim is to look for employment and work after leaving prison.

This portrayed instrumentality motivation, given that this type of motivation relates to an individual's beliefs or expectations that if they behave in a certain way, they will obtain or achieve certain end results (Howard, 1989; Seongsin, 2007). Concurring with this reasoning, E9 explained:

> They want to upskill themselves so that they have something when looking for employment to start lives afresh.

It appears, then, that securing employment was a condition for turning lives around and living crime-free lives. MP5 also added:

> They want to equip themselves ready to go out to work. Some even come back here for supplementary exams. One refused release for another year to finish, saying he won't make it through AET outside.

However, formal employment opportunities may be minimal, Astray-Caneda et al. (2011) indicate that more than 650 000 prisoners released from US prisons seek employment, but that their job prospects are low. Koo (2015) concluded that education increases the opportunities for employment and higher salaries after release because, in general, the higher the educational level, the greater the potential to find employment and obtain higher wages. But while, in general, VIE motivation for participating in AET programmes related to employment, other inmates were perceived to anticipate challenges in securing formal employment in view of their incarceration records. MP4 explained:

> They know it's difficult with criminal records. So, they want to learn everything: business courses, wholesale, retail, small and medium enterprises for self-employment.

Many South African ex-offenders struggle to secure employment (Ngabonziza & Singh, 2012). However, employment would help ex-offenders to live productively and boost their self-esteem, sense of belonging and self-worth. After serving their sentences, it would be up to them, and for the good of their communities, to have a decent chance to re-enter society successfully, become employed and live fulfilling lives (Coates, 2016).

To prevent relapse into criminal activity and prepare for a crime-free life

Allowing inmates to leave prison with the same educational deficiencies which they brought into prison may increase the possibilities of re-offending. E8 explained:

> They want to escape gangsterism in cells, because they don't want to carry it out when released as it can bring them back here.

As alluded to earlier, education offers a less costly alternative for recidivism reduction compared to other solutions, given that, annually, it might cost twice the amount to feed and accommodate a prisoner than to educate them while in prison (Quan-Baffour & Zawada, 2012; Bender, 2018).

Vroom (1964) indicates that before making decisions, individuals estimate how the outcome will play out; for instance, in the above extract, how learning will play out compared to gangsterism. This would propel their VIE motivation to act in a certain way (engaging in AET) because they would see a reward at the end. Violent acts among prisoners are generally linked to prison gangs and are often a major cause of criminal acts in prisons: Lindegaard and Gear (2014) discovered that prisons with higher percentages of gangs experienced higher rates of inmate homicides. Nel (2017) concurs that gangs are prominent in South African prisons and are considered an adaptation strategy to extremely coercive and oppressive prison environments. However, while gangs often jeopardise the personal safety of inmates, they also ironically often offer inmates a sense of safety. Gangs and gang membership also create a sense of power and invincibility (Nel, 2017).

Other prisoners, according to the perceptions of the participants, were motivated by VIE to enrol in AET as a strategy for correcting their criminal behaviour. E1 narrated:

> Some want to be better people after release, to correct criminal behaviour.

MP5 also explained:

> These people now want fulfilment, to prevent re-offending; one said, '… to get my mind from same old wrongdoings that got me here.'

Because of valence motivation, they place great value on the reward or the outcome, given their needs or preferences (Guntoro & Fongmul, 2016) – in this case, being better people. Valence is characterised by the extent to which a person values a given outcome or reward of an act. Apparently, participation in AET programmes offered some prisoners space to reflect and practise being crime-free citizens. It can also be concluded from the managers' and educators' perceptions that inmates' VIE motivations to participate in AET programmes were grounded in a desire to transform, to make personality changes (Illeris, 2009).

In the case of other prisoners, the participants perceived that their VIE motivation emanated from an awareness that education was the choice between a crime-infested and a productive life. They perceived AET programmes to be vital to influencing inmates' families and communities to trust and rebuild confidence in them after their release. MP3 commented:

> To be responsible people, holding something in their hands, with crime-free, decent happy living where family trusts them, want to show that people can change.

In a similar vein, E4 also said:

> … start learning to be people, think through things 'to make good to my victims, family, so they trust me, be proud of me, see a person, not a murderer, or thief, be responsible for my family'.

And E11 elaborated:

> Yeah! Some say they enjoy learning, teachers encourage them, they had never been encouraged to do good, except criminal acts by other criminals. One said it was first time anyone recognised his potential and encouraged him …

E5 explained:

> One said, 'I started getting into trouble very young, skipping school, and started doing terrible things.' Now he wants to learn, get a job, look after his mother, make good to everyone and show his victims that he [had] changed.

These responses suggest valence because the outcomes from performance were regarded as valuable – a qualification might produce valued outcomes such as regaining recognition, trust and responsibility. It can also be theorised that trust, recognition and responsibility were valuable valence motivations for signing on to AET. In managers' and educators' views, these inmates had lost the trust, recognition and responsibility in their families and communities and wanted to regain them. Vroom (1964) indicates that unless individuals are motivated by having an end goal in mind, they may view the work involved to reach the goal or attain a reward as too difficult or too much work to be worth the goal or the reward.

'Making good' implies making amends with their families, victims and society at large. AET provided one avenue that inmates felt would enable them to reflect and make some form of amends. Apart from learning, the respondents perceived that for many inmates, education was pivotal to the process of getting out of the 'glooms' – to ascend and adopt a different 'self' (Richards & Jones, 2004). Being afforded learning opportunities, and being supported, encouraged and equipped with the capabilities to be the responsible people they were initially supposed to be, portrayed instrumentality motivation.

To take the mind off imprisonment and kill time

In this study, some of the inmates were prompted by expectancy, valence and instrumentality motivations to participate in AET programmes in order to take their minds off imprisonment and to kill time.

Respondent E3 wrote as motivation:

> To keep busy, prevent idleness in cells. They say there is nothing else to do, they get bored just sitting around, studying, they pass time.

MP1 confirmed:

> Some say they suffer here, walking up and down hallways cell to cell, under surveillance 24/7 you go mad.

Learning engagement here demonstrates inmates' VIE motivation to take their minds off incarceration and kill time in their rule-bound and coercive settings. Vuk and Dolezal (2019) suggest that engagement in structured learning and pro-social activities in correctional institutions enhances positive behavioural and emotional outcomes for prisoners, as opposed to idleness, which triggers negative inmate behaviour that can pose serious threats to staff and the institution.

Some managers and educators perceived that AET had changed the prison culture in the centres owing to changes in inmates' mindsets.

Participant E7 elaborated:

> They run away from boredom, idling, here their mind-set changes, they become serious, enjoy and are protected.

Serving long sentences without productive activities exposes inmates to 'inmate code' and greater adherence to it, including higher levels of prisonisation (Vuk & Dolezal, 2019). The term 'Inmate Code' or 'Convict Code' refers to rules and values developed among prisoners inside the prison system which define an inmate's image as exemplary and prisoners often use it to emphasise their unity against correctional staff. On the other hand, prisonisation is an inmate code that generally means taking on and accepting the practices, behaviour patterns, customs, mores, culture and social life of the prison. Often, new offenders accept prisonisation and criminal values. Some inmates were apparently escaping these practices, as MP4 reflects:

> They want to 'run' away from prison, here [in an ATE centre] they are 'away'; this prevents sinking into prisonisation. They value being with outsiders of the system, educators. They enjoy the trust not found with insiders.

It can be theorised that engagement in AET protected such inmates from prisonisation and earned them the trust of 'outsiders'. Evidence further indicates that AET participation was primarily a mechanism for surviving an unfriendly environment.

Behan (2014) found that some inmates attended education programmes because there was nothing else for them to do. Key and May (2019) refer to this as 'escaping from the prison' as the time spent in prison school activities did not feel like a prison to them. Crewe (2012:119), in a Wellingborough prison study, discovered that in the education department,

> … prisoners found sanctuary from the stresses of prison life and from the normal terms on which staff–prisoner relations were founded … one of the few zones within the institution that didn't 'feel like a prison'.

The above was certainly the case with some prisoners in the protected spaces explored in this study, as can be ascertained from the perceptions of the participants who confirmed that some inmates joined AET to escape from the daily drudge of the regime to a place where 'you are treated with some dignity and respect' (Behan, 2014:24).

Conclusion and implications

This study sought to elicit the views of prison instructors with regard to reasons why prisoners pursue AET programmes. From the data gathered, prisoner participation in AET was indeed influenced by VIE motivations as outlined by Vroom (1964). It could be concluded that inmates, according to centre managers and educators, joined AET because they believed

putting in an effort would yield good performance, which in turn might produce outcomes (e.g. good grades) and ultimately obtain desirable rewards.

Prisoners, according to respondents in this study, pursued AET programmes to improve their education and prepare for employment following their release.

Prisoners wanted to prevent a relapse into criminal activities and re-imprisonment and to prepare instead for a crime-free life. Third, they desired learning to take their minds off their incarceration and help them to pass the time in prison constructively.

These findings on prisoner motivations have some implications for policy and practice. To begin with, the attitudes and trust of the public and employers play a significant role in prisoners' re-integration into communities and employment. Ex-offenders need to be given opportunities to rebuild their lives through the provision of basic workplace skills for employment, supportive contexts for rebuilding trust and, as suggested by Johnson (2015), enabling activities that support re-entry into communities. In addition, through policy, employers should be encouraged not to turn down job applications from ex-offenders based on their criminal records, but instead examine their backgrounds and their life circumstances that led to crime; identify potential strengths and risk factors (UNODC, 2015) and then consider hiring them.

While this study of limited scope yielded valuable findings, it involved only five of the nine provinces, and one centre per province, therefore future research based on a larger, more representative sample could substantively expand upon the findings of the present study.

In closing, although the focus of this study was on prisoner motivations and not the quality of delivery or other issues, centre managers mentioned their own frustrations in trying to deliver quality AET programmes, including a lack of support from AET authorities and inadequate teaching and learning resources. Educators expressed feelings of professional isolation which impacted on their classroom delivery and suggested they be included in staff development initiatives to assist them. The study herein inadvertently highlighted potential systemic problems which would be worth following up on in future research endeavours.

Acknowledgements

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Enhancing technical and vocational knowledge and skills of adult learners in Ghanaian universities

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ABSTRACT

This study examines the perceptions of adult learners of the factors that enhance their vocational knowledge and skills in engineering programmes in Ghanaian universities. Using focus-group discussion, we gathered data from adult learners enrolled in telecommunications and electrical engineering programmes in three universities in Ghana. The results show that the technical and vocational knowledge and skills of adult learners are enhanced by an effective pedagogical approach, the application of advanced technology in the teaching and learning process, the development of practice-based experiences and the application of new knowledge to the work environment. The study highlights adult learners' identification of inadequate teaching and learning resources and weak pedagogical approaches in delivering telecommunications and electrical engineering courses as major challenges to the development of the vocational and technical knowledge and skills of adult learners.

Introduction

Globally, the essential role of technical and vocational education and training (TVET) in national development has been highlighted by various research and policy documents such as UNESCO's Strategy for Technical and Vocational Education and Training (TVET 2016–2021) (UNESCO, 2016). The UNESCO document emphasises the promotion of quality lifelong learning opportunities for all and, importantly, how vital the acquisition of technical and vocational skills is for employment, decent work and entrepreneurship (UNESCO, 2016). Other studies, particularly those from developing countries (Nwogu & Nwanoruo, 2011; Ngor & Tambari, 2017), highlight the importance of TVET for employment, positing that '[t]he importance of TVET to human and national development cannot be over-emphasised' (Ngor & Tambari, 2017:3).

Yet, in Ghana, the implementation of TVET has not been without its challenges. Research findings show that a skills gap still features prominently in industry labour needs (Akomaning, Voogt & Pieters, 2011) and that a lack of resources, including state-of-the-art laboratory equipment and simulators, affects quality TVET delivery in Ghana (Boahin & Hofman, 2012). In relation more specifically to engineering education, challenges include the growing demands of a global industrial environment and the diverse learning needs of students (Henri, Johnson & Nepal, 2017).

The gaps in the education of adult learners – especially in the higher education (HE) sector in Ghana – can be assessed from three major perspectives. The first relates to the paucity of research on the importance of lifelong education as a tool for national development, social change and personal development. Second, while universities in Ghana continue to record an increasing enrolment of adult learners in engineering, especially from the technical and vocational institutes, not much has been done to develop appropriate teaching and learning approaches to meet their peculiar knowledge and skills needs. Third, although universities are expected to provide students with practice-based experiences through students' placement in industries and in laboratory and fieldwork, and the use of advanced technology in the teaching and learning processes, challenges still exist in these areas.

In order to help resolve these issues, this study was undertaken at three universities in Ghana that provide engineering education to students, including adult learners. Furthermore, this article focuses specifically on the factors that could enhance vocational knowledge and skills in engineering programmes in Ghanaian universities from the adult learners' perspective. In the context of the current study, technical and vocational skills refer to the technical knowledge, practical competencies and sound attitudes that are required by adult learners in the engineering field to perform their job functions effectively in their workplace. As HE researchers, we were particularly interested in examining the factors that could enhance the technical and vocational knowledge and skills of adult learners in engineering programmes in Ghana.

For the purposes of this study, we define adult learners as students who did not enrol at university directly after high school but pursued other forms of (mainly in-service) training. Later they entered HE degree programmes as mature students based on their age, work experience, prior entry qualifications and having passed entrance examinations. This study draws on the perceptions of adult learners in telecommunications and electrical engineering programmes at three universities in Ghana in order to identify the factors that could enhance the development of their vocational and technical knowledge and skills in university settings. Earlier studies focused, for example, on redesigning engineering programmes through the application of experiential learning theory (Li, Öchsner & Hall, 2019), whereas Gadola and Chindamo (2019) highlighted the importance of a competitive ground-up project in engineering to promote students' emotional interest, motivation and involvement. Focusing on the link between formal learning and the acquisition of job skills, Römgens, Scoupe and Beausaert (2020) examined the relationship between the employability, workplace learning and knowledge and skills development of students in HE. While these studies focused on the significance of the development of the knowledge and skills of students required for personal growth and economic development, little is known about the factors that enhance the development of the technical and vocational knowledge and skills of adult learners. The current study examines the perceptions of adult learners regarding the factors that enhance their vocational knowledge and skills in engineering programmes at Ghanaian universities.

The study was guided by the following research questions (RQs):

> RQ1: What factors do adult learners perceive as necessary for the development of the vocational and technical knowledge and skills of adult learners pursuing engineering programmes in HE?

> RQ2: How can those factors (in relation to RQ1) enhance the vocational and technical knowledge and skills of adult learners in HE to satisfy the knowledge and skills demands of industry?

Ghana as the context of the study

The World Bank (2019) reports that Ghana's economic growth in 2017 was mainly driven by the mining and oil sectors and also stable cocoa production levels that currently make the country the second-fastest-growing economy in Africa after Ethiopia. Growth in gross domestic product (GDP) in the first and second quarters of 2018 was estimated at 5,4% (World Bank, 2019). This economic growth can be sustained through a skilled and knowledgeable workforce that is trained to support the country's developmental agenda. Regarding the provision of education, the qualifications structure of Ghana consists of basic, secondary and tertiary levels of education. According to UNESCO (2019), the basic to secondary transition rate in 2017 was 94,8%, which is quite high. Conversely, with the current tertiary gross enrolment rate at 18,7%, many students who leave secondary schools are not able to transition to tertiary institutions and have to defer their tertiary education to

later in their lives, if at all. This calls for a 'cradle-to-career' system within a national framework that provides opportunities for all categories of learner, including adult learners in tertiary institutions, to obtain essential knowledge and skills through active, consistent and persistent engagement in a learning environment (Lawson & Lawson, 2013).

In spite of the obvious need for adult learners in Ghana to undergo technical and vocational education and training (TVET), various studies reveal that factors such as weak management support, inadequate resources, including training materials, and insufficient pedagogical support from lecturers impede effective training (Boahin & Hofman, 2012); these also combine to reduce the motivation of students to obtain the necessary skills relevant to industry practice. Akomaning et al. (2011) argue that these challenges include gaps in the capacity of higher education institutions (HEIs) to develop the knowledge and skills of students to meet industry and developmental needs.

As part of the reforms in the TVET sector, Ghana introduced the National Technical and Vocational Education and Training Qualifications Framework (NTVETQF) as a sub-framework of the National Qualifications Framework (NQF) in 2012. The aims of the NTVETQF are to (1) bring all post-basic, occupation-oriented qualifications together under a unified qualifications framework; (2) facilitate access to further education and training for individuals in technical and vocational occupations; (3) improve product and service quality by ensuring uniform standards of practice in the trades and professions; and (4) promote access to lifelong learning for all, especially those working in the informal economy (UIL, 2014:2). Table 1 shows the NTVETQF in Ghana with information on the certification level, qualification, status and certifying institutions.

Table 1:   The NTVETQF in Ghana (UIL, 2015)

CERTIFICATION LEVEL	QUALIFICATION	STATUS	CERTIFYING INSTITUTION
8	Doctor of Technology (DTech)	Formal	Not available
7	Master of Technology (MTech)	Formal	Technical universities*
6	Bachelor of Technology (BTech)	Formal	Technical universities
5	Higher National Diploma (HND)	Formal	Technical universities
4	Certificate II	Formal	GES-TVET institutions*
3	Certificate I	Formal	GES-TVET institutions
2	Proficiency II	Informal/ Non-formal	NVTI/Informal trade associations*
1	Proficiency I	Informal/ Non-formal	NVTI/Informal trade associations

** **Notes:** The Technical Universities (Amendment) Act, 2016 (Act 922) converted the ten polytechnics in Ghana into fully fledged technical universities. GES-TVET = Ghana Education Service – Technical and Vocational Education and Training; NVTI = National Vocational Training Institute.*

Adult learning programmes have been in existence in Ghana for some time. For example, through its Institute of Continuing and Distance Education, the University of Ghana has developed programmes for adult learners in different fields of study (Tagoe, 2012). Other universities, such as the Kwame Nkrumah University of Science and Technology and the University of Cape Coast, also have structures that support adult learners. In the context of this study, we focus on the development of the vocational and technical knowledge and skills of adult learners who were enrolled for telecommunications and electrical engineering programmes at three Ghanaian universities.

In Ghana, proficiency training in the field of telecommunications and electrical engineering is provided by a variety of technical and vocational institutes and other further education institutions, where students are equipped with practical knowledge designed for industry work. When these individuals, after several years of working, proceed to enrol in HE for additional formal qualifications that cannot be acquired through in-service training, they are compelled to follow the programmes designed for traditional secondary school-leavers. Further evidence suggests that the incongruity between the capacity of HEIs to deliver training that fosters employability and the knowledge and skills demands of industry is a major challenge for the economic development of the country (Akomaning et al., 2011). Although sustained efforts have been made to mitigate the effect of pedagogical and curriculum weaknesses in the structure of adult learning programmes through continuing education (NCTE, 1998), the results show very little effect. The challenges adult learners face are often associated with the pedagogical approaches used by academics in the teaching and learning process that cater primarily for 'traditional' undergraduate students, i.e. school-leavers. However, the learning approach of adults differs from that of 'traditional' students because adult learners mainly develop their knowledge and skills through their rich experiences and often connect these experiences to the learning environment (Martin, 2012).

Experiential learning as a theoretical approach

The history of experiential learning theory (ELT) can be linked to the works of important authors in the 20th century. They include John Dewey, Kurt Lewin, Jean Piaget, William James, Paulo Freire and Carl Rogers, who sought to explain and develop the experiential learning process as well as the multilinear model for adult development (Kolb & Kolb, 2005). ELT derives from the constructivist theory of learning which suggests that social knowledge is created and re-created through the personal knowledge of the learner (Kolb & Kolb, 2005:194). Markedly, ELT is defined as 'the process whereby knowledge is created through the transformation of experience and the combination of grasping and transforming experience' (Kolb, 1984:41). In simple terms, experiential learning often involves an overt intention on the part of the learner to learn (Moon, 2004) on the understanding that learning can take place only with experience (Morris, 2020). The inseparability of learning and experience has been espoused by Moon (2004), who argues that learning involves experiences. However, notwithstanding the assertion that most learning involves experiences, other authors (Beard & Wilson, 2013:17–51) have argued that not all experiences lead to new

insights and learning but, rather, learning takes place when individuals reflect on their experiences.

The ELT model consists of two dialectically connected modes of obtaining experience – concrete experience and abstract conceptualisation – and two dialectically connected modes of transforming experience – reflective observation and active experimentation (Kolb & Kolb, 2005). Accordingly, knowledge is constructed through a creative tension between the four learning modes, which are often presented as an idealised learning cycle where learners are expected to go through a complete learning process of experiencing, reflecting, thinking and acting in a learning setting. To this end, concrete experiences serve as the foundation for observations and reflections on learning, whereas learning is regarded as unproblematic, accessed by the conscious thought of individuals and processed through apprehension (Holman, Pavlica & Thorpe, 1997). Experience is therefore an important aspect of learning, revealing that learning takes place through experience (Morris, 2020). The growing interest in practice-based experiences in HE across the world is, among other things, driven by pressure on HE providers to meet both the needs of industry by training students who have the requisite knowledge and skills to serve those needs and the need for students to obtain an HE qualification (Kennedy, Billett, Gherardi & Grealish, 2015). Essentially, concrete experiences that are gathered by learners during practice-based learning serve as the foundation for the observations and reflections that are required in engineering education (Billett, 2015). Evidence suggests that engineering graduates in the modern era lack the necessary skills – such as strong communication and problem-solving skills, and effective functioning as members of teams – that are essential to solving problems associated with engineering practice (Yadav, Subedi, Lundeberg & Bunting, 2011).

Whereas practice-based learning is essential to developing knowledge and skills in adult learners, this cannot be dissociated from the use of appropriate and effective pedagogy for developing the knowledge and skills of adult learners which is essential to enhancing their vocational and technical competencies. In the context of the current study, effective pedagogy is explained as the adult-learner-centred teaching and learning approaches that aim to develop the knowledge and skills of adult learners through practice-based experiences and the application of new knowledge to the work environment. A previous study has shown that effective pedagogy consists of the process of recognising students as learners and co-creators of learning experiences, as junior scholars and as partners in academic cultures (Senior, Fung, Howard & Senior, 2018). Distinctly, adult learners tend to understand their environment through the formulation of ideas that arise out of interaction, experiences and reflection (Cook-Sather, 2014). Reflection involves the reconstruction of theoretical and professional knowledge obtained from real-life experiences that are transformed through engagement (Usher, 2009). Significantly, reflections are integrated and condensed into abstract concepts from which new ideas and concepts emerge. In the context of our study, reflection involves reconstructing professional knowledge that is gained from experiential knowledge; and the role of a lecturer is to shape the understanding of students about how to blend theory and practice so as to meet the expected learning outcomes.

Other learning concepts are also relevant to adult learners in engineering. For example, through concept mapping (Watson, Pelkey, Noyes & Rodgers, 2016), students link different engineering concepts visually. Furthermore, by way of signature pedagogies (Shulman, 2005), which define the teaching processes that are aimed at developing the knowledge and skills required for professional practice, adult learners are able to develop their vocational competencies. Land (2013) uses the concept of mechanical dissection to explain how teaching and learning could be designed to support the forensic problem-solving aspect of engineering education. Another factor is the application of advanced technology in teaching and learning processes. The complexities of modern work processes stem from the application of advanced technology in the production of goods and the delivery of services in a continuously evolving global space. Importantly, the application of advanced technology (Ogundari & Awokuse, 2018) and innovation (Valero & Van Reenen, 2019) are vital to developing the knowledge and skills of adult learners.

ELT identifies learning as an important determinant of human development and the process by which learning shapes the course of the personal development of individuals. Although there are several advantages associated with ELT, it has some weaknesses. First, ELT has been criticised as being misplaced or over-simplified because of its emphasis on reflection as a separate and primary device that gives meaning to experience – therefore creating a thin line between experience and reflection. Second, the meaning given to a mediated experience remains vague and lacks clarity, especially because experience is socially and historically formed (Holman, Pavlica & Thorpe, 1997). In contrast, Moon (2004) opines that teaching is one of the processes through which learning is mediated and this could be done through face-to-face distance learning or online modes and with tools such as textbooks, electronic resources and journals. In spite of its shortcomings, though, ELT, with its focus on concrete experience and reflective observation, is a useful theoretical approach to adult learning.

The study

In order to investigate the factors that are essential to the development of the technical and vocational knowledge and skills of adult learners in HE, we relied on interviews with participants who were adult learners in three diverse universities in Ghana. We used group discussions to gather information from adult learners in engineering programmes regarding the factors that the participants believed are necessary to develop their vocational and technical knowledge and skills.

Sampling and participants

The population of our study consisted of 129 adult learners who were registered for Electrical and Telecommunications Engineering programmes at three diverse universities in Ghana. We purposely chose three universities that are diverse in size, operations and structure because we sought to obtain a diverse range of responses from adult learners. The universities were one private university (PRU) with a total student population of 5 008, one public university

(PUB) with 42 590 students and one special-purpose regional university (SPU) with a student population of 1 550.

We used a purposive sampling method for recruiting participants for the focus-group discussions. The sample consisted of 27 adult learners (nine participants in groups of three from each of the three universities) who were also employees of different engineering firms in Ghana. Purposive sampling refers to the strategies for selecting participants in a study based on the assumption that particular individuals may hold important views and ideas about a particular phenomenon (Campbell, Greenwood, Prior, Shearer, Walkem, Young, Bywaters & Walker, 2020). To verify the above details, we included the work experience domain in participants' demographical data to obtain information on the number of years that participants had worked in either the telecommunications or the electrical engineering sector. Nine participants indicated that they had industry experience of six to ten years, while eight indicated that they had worked in industry for three to five years and six participants stated that they had worked in either telecommunications or electrical engineering firms for one to two years. A minority of the participants (4) had worked in industry for more than ten years. Table 2 shows the socio-demographic information of the participants.

Table 2: Socio-demographic features of participants (adult learners)

PARTICIPANT	INSTITUTION	PROGRAMME OF STUDY	YEARS OF PROFESSIONAL EXPERIENCE	FIELD OF EMPLOYMENT
RMUA1	Regional University	BSc EEE	2	Private engineering firm
RMUA2	Regional University	BSc EEE	8	Ports and Harbours
RMUA3	Regional University	BSc EEE	2	Private engineering firm
RMUB1	Regional University	BSc EEE	8	Security service
RMUB2	Regional University	BSc EEE	3	Electrical engineering firm
RMUB3	Regional University	BSc EEE	7	Water company
RMUC1	Regional University	BSc EEE	2	Aviation
RMUC2	Regional University	BSc EEE	4	Ports and Harbours
RMUC3	Regional University	BSc EEE	5	Ports and Harbours
PUBA1	Public University	BSc EEE	7	Government ministry
PUBA2	Public University	BSc EEE	5	Cement manufacturing firm
PUBA3	Public University	BSc EEE	13	Electricity company of Ghana
PUBB1	Public University	BSc EEE	2	Private engineering firm
PUBB2	Public University	BSc EEE	5	Government ministry
PUBB3	Public University	BSc EEE	7	Telecommunications company
PUBC1	Public University	BSc EEE	1	Warehouse

Table 2:   Socio-demographic features of participants (adult learners)

PARTICIPANT	INSTITUTION	PROGRAMME OF STUDY	YEARS OF PROFESSIONAL EXPERIENCE	FIELD OF EMPLOYMENT
PUBC2	Public University	BSc EEE	16	Electricity company of Ghana
PUBC3	Public University	BSc EEE	9	Educational institution
PRUA1	Private University	BSc Tel Eng	2	Private telecommunication firm
PRUA2	Private University	BSc Tel Eng	3	Vodafone Ghana
PRUA3	Private University	BSc Tel Eng	7	Huawei Ghana
PRUB1	Private University	BSc Tel Eng	6	Aviation company
PRUB2	Private University	BSc Tel Eng	24	Private telecommunication firm
PRUB3	Private University	BSc Tel Eng	13	Energy firm
PRUC1	Private University	BSc Tel Eng	5	Huawei Ghana
PRUC2	Private University	BSc Tel Eng	7	Vodafone Ghana
PRUC3	Private University	BSc Tel Eng	4	Vodafone Ghana

BSc EEE = BSc Electrical/Electronic Engineering
BSc Tel Eng = BSc Telecommunication Engineering

Procedure

In recruiting the participants for our study, we obtained the list of adult learners and their contact details from their course representatives. After that, we contacted 63 students individually by phone to explain the rationale of the study and their role in the focus group. The adult learners who consented to participate in the focus group were then contacted by phone again and an agreed date for the group discussion was scheduled. Each participant was informed about the potential benefits and risks of the study as well as their right to withdraw from the interview. Then the participants were given consent forms to sign before we administered the interview questions and they were encouraged to express themselves freely without any restrictions. We followed the same procedure for conducting the group discussions at all three universities. The duration of each group discussion was between 45 minutes and one hour. Data were gathered through audio-recording devices.

A semi-structured interview schedule was used to gather narrative data from the participants. One of the advantages of using a semi-structured interview schedule in a focus-group discussion is that it enables the interviewers to probe and proceed with follow-up questions where necessary (Walker & Gleaves, 2016).

Questions were designed to elicit information on: the relevance of technical knowledge and skills in the current telecommunications or electrical engineering programme; the teaching methods used by lecturers; whether lecturers challenge students to develop analytical skills,

independent study and application of key concepts to professional roles; whether feedback assists in improving learning activities and developing relevant proficiency in specific areas of improvement; whether the application of technology in the teaching and learning process enhances knowledge and skills; any new technologies or equipment recommended for the university to procure; and the relevant job skills that may have been introduced in the programme.

In order to avoid ambiguities in the questions developed, we undertook a pre-test of the instrument among six participants recruited from the Private University and revised some of the interview questions on the basis of this feedback.

Participants were requested not to provide any personal information that could link them to the data, so as to preserve confidentiality. Furthermore, only the interviewer and the focus-group participants were present in the interview venue while the voice recorders were placed in plain sight of the participants. All the participants were informed about the procedure adopted to process and store the data safely. This process included storing the electronic data on a password-protected computer and the hard copies of the transcripts in a safe. The research project was approved by the Research Ethics Committee of the researchers' home university. In addition, institutional permission was obtained from each of the three institutions from which participants were recruited.

Data analysis

The interview schedule for the group discussions consisted of seven questions, mainly on the factors that enhance the development of the vocational and technical knowledge and skills of adult learners in engineering. We used thematic analysis to examine the narrative data gathered from the participants. One of the advantages of thematic analysis is the theoretical freedom and flexibility (Braun & Clarke, 2006) that it allows researchers in examining complex and rich datasets (Neuendorf, 2019). This process included listening to the audio recordings and transcribing them and then developing the codes, categories and themes from the data (Nowell, Norris, White & Moules, 2017). These steps were necessary to obtain rich information on the participants' perspectives of the factors that enhance their vocational knowledge and skills in engineering programmes at Ghanaian universities. In order to analyse the data, the first step we took was to search the data for important phrases and sentences the participants may have used concerning the factors that would contribute to their vocational and technical knowledge. Phrases or sentences that appeared six times or more were highlighted. Some examples of the codes that were highlighted are: 'laboratories need to be well equipped'; 'connect theories with field'; 'feedback from lecturers'; and 'importance of technology application'.

The second step involved grouping the codes that emerged into categories. For example, 'we receive feedback from our lecturers through emails and report sheets' and 'I receive regular feedback from my lecturers' were collapsed into 'feedback processes and frequency in teaching and learning'.

The third step involved developing the themes based on the patterns that emerged from the codes and categories of the narrative data. Some examples of the themes that emerged were: 'teaching and learning approach'; 'application of new knowledge to the work environment' and 'practice-based experiences'. Making interpretations from analysed data is important to drawing conclusions in research that adopts thematic analysis (Castleberry & Nolen, 2018). One of the reasons for providing detailed information about the processes used in analysing the narrative data was to reveal the methodological thoroughness of the research design and enhance the trustworthiness of the empirical process. Trustworthiness in qualitative research refers to the methodical thoroughness of the research design, the credibility of the researcher, the authenticity of the findings and how applicable the research methods are to future research (Rose & Johnson, 2020).

Results

Analysis of the data resulted in five main themes:

- development of adult learners' technical knowledge and skills in engineering;
- engineering education and technology application;
- teaching and learning approach;
- application of new knowledge to the work environment; and
- practice-based experiences.

Each of these is expanded upon below.

Development of technical knowledge and skills

The first item sought the views of the respondents regarding the ways in which their programmes provide them with relevant technical knowledge and skills that are necessary for appropriate occupational outcomes. A focus-group participant in the public university indicated that

> [t]he introduction of certain core engineering courses in our programme has given us new ideas for our work processes ... most of the theories we learn connect to our work processes and we are able to share ideas with our colleagues and facilitators [PUB3].

A similar view was shared by a participant from the specialist regional university:

> We have been introduced to software for designing engineering tools and for system diagnoses as well as safety in the engineering field which are very important for our practice [SPU3].

PRU7, who was a participant from the private university, highlighted the importance of connecting the theories learnt in class to the fieldwork and also the challenges associated with the lack of modern laboratory equipment:

> For me I am always on the field and so I am used to these modern tools. However, the laboratory tools are very expensive and the university cannot afford [them]. The truth is that I take a lot of lessons from the theories I learn in class to help me apply them well on the field [PRU7].

The feedback from the participants shows that the expectation of adult learners is to be able to connect the theories they learn in the learning environment to their workplace setting. One of the important features of ELT is the creation of knowledge through transforming experiences (Morris, 2020).

Engineering education and technology application

In engineering education, the application of technology in course delivery represents a very important facet of developing the vocational and technical competencies of adult learners, because students are taught content that is not only relevant to their current professional practice, but informs future practice. A participant from the specialist university indicated that

> technology application is important in the marine field. There are modern technologies being used and we must have knowledge of the tools … yes, we have the simulator but the labs need to be well equipped [SPU1].

Conversely, SPU9 decried what he perceived as the challenges students face in developing their skills through the use of modern equipment:

> [O]ur laboratories should be well resourced to enable us (to) acquire the necessary skills in the industry. Presently, we have very few laboratory sessions and, as engineers, we consider this as very inadequate for our skills development. We think that our colleagues reading marine engineering are given preferential treatment because they have a simulator and a state of the art laboratory while we still use our old laboratories [SPU9].

A participant from the private university highlighted some of the challenges by saying that:

> … technology in telecommunication evolves and our employers expect us to be abreast with the changes in the industry. Our challenge now is a lack of well-equipped laboratories with modern equipment [PRU2].

Pressed further, she added that

> [w]e expect to see routers, modernized servers and transmission systems, antennas, signal generators, simulation boards, oscilloscopes and frequency counters [PRU2].

The challenges participants from the public university faced in developing their practical skills were highlighted by PUB8:

> I do not think that I can say anything about the application of technology, the labs or equipment. Remember this is a learning centre so they cannot bring the labs here. If anything, it will have to be at the department lab in Kumasi [PUB8].

For her part, PRU8 touched on the gap between what is taught in class and the practical skills required for the world of work:

> I work in a telecommunication company and I must state that there are new technologies that are currently being used which are not in our laboratories. I think that the university should think of introducing CISCO Networking Certification Training, Complex programming languages and practical field training on transmissions. This will go a long way to help us in our work [PRU8].

Emerging technology and its application in telecommunications and electrical engineering continue to receive wide attention owing to the future of work and the dependence on technology. The data from participants clearly show that adult learners have a deeper understanding of the use of technology in their workplace setting and also expect that they could apply the same technology in the learning environment. However, the lack of well-equipped laboratories serves as a major challenge to the vocational knowledge and skills development of adult learners.

Teaching and learning approach

We then sought the views of participants about the teaching and learning approach used by their lecturers to enhance their knowledge and skills in engineering. A participant from the public university highlighted what he perceived as the practical gaps in the teaching and learning process:

> The teaching methods are okay … the only problem we face is that we do not have enough practical lessons as we expect. The university should employ people from industry to teach us [PUB3].

From the same university, PUB6 was of the view that teachers have different approaches to teaching students:

> Every teacher has his or her own method of teaching. I do not think that they all use the same method. Some teachers are very good when it comes to theory while others are also very good when it comes to practical [PUB6].

A similar view was shared by PUB7, who stated that

> our lecturers can only teach what they know. We will have to work hard and pass the courses. I do not think that the teaching methods will make any difference. Most of us have the practical skills already; what we need is the qualification [PUB7].

A participant from the private university noted that

> [t]he learning activities and outcomes for each course is provided by our facilitators and these often show the activities required of individuals and groups […] and we consider the content of our programmes as very relevant to our professional practice [PRU1].

The challenges adult learners faced in their learning processes were highlighted by a participant from the specialist university, who indicated that

> although we consider the learning activities as important for developing our thinking abilities and learning goals, we do not receive feedback on our assignments from some of our facilitators as expected [SPU5].

This is unfortunate, as any effective teaching and learning process should include feedback mechanisms that allow students to measure their learning through either summative or formative assessment processes. Regarding the intersection between theory and practice, one of the participants from the private university indicated that

> [w]e are able to easily relate the theories we learn in the lecture hall with the field experiences […] this helps us to understand the course better [PRU5].

Another participant from the private university indicated that

> the absence of a modern laboratory for our practical work, internet connectivity for our research and insufficient numbers of relevant Engineering textbooks in the library really affects our study as adult learners [PRU3].

Application of new knowledge to the work environment

The fourth item for discussion focused on the application of new knowledge to the adult learners' work environment. A participant from the specialist university noted that

> [w]e often connect the theories we learn and the relevant fieldwork we undertake to better understand the courses we are taught [SPU3].

Conversely, SPU7 indicated that he could not connect the majority of what he learns at the university to his workplace setting:

> Most of the work we do on the field [is] not related to what we learn here. This is because there are different branches of electrical engineering and it would be important for us to have areas of specialisation [SPU7].

A participant from the public university stated that

> [w]e consider the blend of our experiences and theory as okay … but there [are] always some differences in the way we perceive things. But we are able to understand the theories better because we are on the field [PUB2].

One of the advantages adult learners have at the university is their ability to connect theory with the practical aspect of their jobs. Similarly, they are also able to apply the new knowledge they obtain in the learning environment to the workplace setting.

Practice-based experiences

The last question sought to gather information regarding the development of practice-based experiences of adult learners. A group member observed that

> [t]he university does not place much emphasis on skills development through industrial attachment. Moreover, students who undergo industrial attachment are not awarded credits for the knowledge they acquire from the practical field [SPU4].

A participant from another group opined that

> [i]n my class, we are mostly workers so we often share our practical experiences and ideas during lectures and laboratory sessions … it will not be possible for me to undergo industrial training while I am enrolled in this programme [PUB2].

Conversely, a participant from the private university mentioned that

> industrial attachment is mandatory for us … we are awarded marks when we get attached to industries [PRU3].

Pressed further to explain how she was able to undergo industrial attachment since she was working, she explained that students usually arranged for leave, explaining to their employers the need to obtain experience from other workplace settings.

The responses from the focus-group participants revealed the different structures and arrangements that existed for adult learners in order to develop their practice-based experiences at universities. Conversely, when universities do not make provision for students to receive practical industrial training, it affects the development of their practical skills required for industry work. One of the ways of ensuring that students undergo mandatory industrial attachment is by awarding credits when they complete the attachment process. With changes in global workspaces as a result of the COVID-19 pandemic and the reliance on technology for work activities, there is a need for HEIs in the global sphere to consider upscaling the use of modern technology in the teaching and learning process.

Discussion

An analysis of the data shows that the vocational and technical knowledge and skills of adult learners are strongly enhanced by:

- an effective pedagogical approach in engineering education;
- the application of advanced technology in the teaching and learning process;
- students' development through practice-based experiences; and
- the application of new knowledge to the work environment.

Whereas previous studies had highlighted the importance of TVET to human and national development (Nwogu & Nwanoruo, 2011; Ngor & Tambari, 2017), not much was known about the factors that enhance the vocational knowledge and skills of adult learners in HE. In order to investigate these gaps, the current study used ELT as the theoretical underpinning to examine the ways adult learners studying telecommunications and electrical engineering programmes perceive the factors that enhance their technical and vocational knowledge and skills.

First, whereas the application of advanced technology in the learning process of adult learners is important to developing their vocational knowledge and skills, the findings revealed gaps in the application of advanced technology in the teaching and learning processes in the universities sampled for the study. The lack of advanced technology that is necessary for modern professional practice was highlighted by participants at the specialist and private universities as some of the challenges they faced in developing the requisite knowledge and skills for the world of work. Undoubtedly, the future world of work is characterised by the automation of work processes (Russo, 2020), emerging technologies and the increasing knowledge and skills expectations of employers (Succi & Canovi, 2020) which place greater responsibilities on HEIs to develop structures and systems that support the development of these skills. In relation to ELT, the application of advanced technology both contributes to adult learners' concrete experience and provides them with opportunities for active experimentation. Furthermore, the development of students' knowledge and skills should include the application of technology in work processes (Bucciarelli & Drew, 2015; Ogundari & Awokuse, 2018) that aims at innovation (Valero & Van Reenen, 2019) and economic

development (Borcan, Olsson & Putterman, 2018; Zheng, Hatakka, Sahay & Andersson, 2018).

While it is an undeniable fact that HEIs cannot obtain all the technology needed to train students, through partnerships and cooperation agreements, HEIs could use technologies owned by industries to support their teaching processes. With a growing emphasis on the application of technology in all aspects of production and services (Takala & Korhonen-Yrjänheikki, 2019), the development of the vocational and technical competencies of adult learners to include advanced knowledge in technology has become essential.

The findings of the study show that an effective pedagogical approach is essential to enhancing the development of the vocational and technical knowledge and skills of adult learners in HE. An effective pedagogical approach is of particular importance to create opportunities for abstract conceptualisation. The data analysis also revealed differences in the perceptions of the students about the pedagogical approaches used by the three universities. For instance, issues related to a lack of strong connections between theory and practice – especially those that are related to laboratory activities, feedback on assignments and challenges associated with grasping certain core engineering principles – were highlighted by adult learners at the specialist university. In contrast, although the participants from the private university expressed the opinion that there was a balance between theory and practice in their teaching and learning with the necessary formative and summative assessment processes, they decried a lack of resources – including engineering textbooks, internet connectivity and some laboratory equipment. This particular finding corroborates earlier research by Boahin and Hofman (2012), who argue that a lack of resources such as state-of-the-art laboratory equipment and simulators negatively affects quality TVET in Ghana. And when providers of HE do not emphasise the importance of relevant pedagogical approaches such as simulation (Rooney & Boud, 2019) and strong feedback mechanisms, this could negatively affect the development of technical and vocational competencies. Previous research has shown that the development of an engineering curriculum should, among other things, aim at meeting the needs of learners and providing them with relevant knowledge (Huff, Zoltowski & Oakes, 2016). However, in some HEIs, curriculum planning activities often centre on the internal capacities of the institutions as measured by their teaching staff and internal consultation rather than on labour market requirements (Milutinović & Nikolić, 2014).
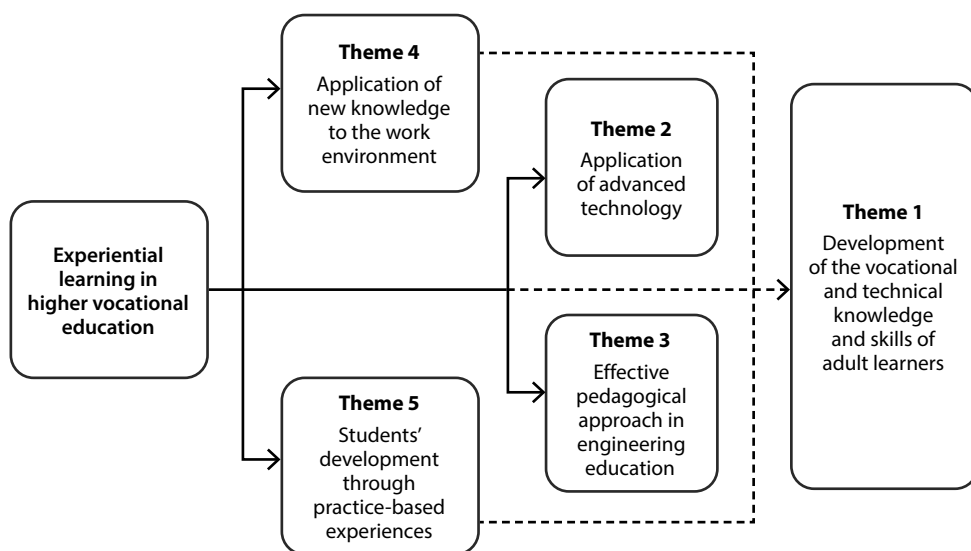
Fourth, the application of new knowledge to the work environment represents the last aspect in our framework that enhances the development of the vocational and technical knowledge and skills of adult learners in HE. This relates to ELT's concrete experience and active experimentation. Participants from the different universities opined that they were able to apply to their work activities the new knowledge they obtained from the theory and practical laboratory exercises. The quest by individuals to develop their knowledge and skills through acquiring HE qualifications for the purposes of preparing for future careers remains one of

the reasons for the gradual shift from the conventional liberal notion of HE to higher vocational education (Kennedy et al., 2015). Although growing interest in practice-based experiences is the result of increasing demand by industry for graduates who are skilled and knowledgeable (Kennedy et al., 2015), adult learners often have different expectations: the majority of them are employed by industry and are usually unable to undertake industrial attachment activities outside the learning environment. When education providers do not support the development of the technical knowledge and skills of adult engineering students, the students leave the university environment with very little practical experience required for their occupational activities. This therefore suggests that providers of education will have to design a variety of learning activities that enhance their practice-based experiences. These activities could include discussions about practical experiences in classrooms and laboratories and the use of simulators in the teaching and learning processes.

Finally, the findings of the current study revealed the significance of the practice-based experiences of adult learners that include a process of knowledge reconstruction and reflection, connecting their knowledge and skills expectations to those desired by industry. Prior research revealed the importance of reflection to the learning process of students (Usher, 2009; Cook-Sather, 2014). Furthermore, the transformation of the learning experiences of adult learners requires opportunities for reflection to be created in the learning environment (Morris, 2020) and also outside it, especially in the engineering workplace setting.

The development of technical knowledge and skills in engineering is necessary for adult learners to be able to meet the knowledge and skills expectations of employers. Two main issues stood out clearly from the submissions of the participants from the public and the specialist universities. The first is that the introduction of core engineering courses and software that cover the technical knowledge and skills of engineering students will provide them with new ideas for their work and their professional practice. Second, by introducing adult learners to the relevant theories that connect with their work processes, their learning processes are enhanced and they are enabled to share ideas with their colleagues and teachers. By means of enriched occupational practice in engineering disciplines, adult learners equip themselves for the challenges that come with additional responsibilities when they obtain their degrees. In addition, a structured learning process that recognises a strong relationship between the value of HE and graduates' broader capability sets (Tomlinson, 2018) is essential to the development of the vocational and technical knowledge of adult learners. Furthermore, through effective teamwork, communication skills (Pang, Wong, Leung & Coombes, 2019; Vesikivi, Lakkala, Holvikivi & Muukkonen, 2019) and the diffusion of knowledge and skills to cope with complex work situations (Takala & Korhonen-Yrjänheikki, 2019), adult learners could enhance their performance in the workplace.

These results have led us to develop a framework for the enhancement of vocational knowledge and skills of adult learners that is illustrated in Figure 1.

Figure 1:   Vocational and technical knowledge and skills enhancement framework (own elaboration)

The first theme highlights the importance of developing the vocational and technical knowledge and skills of adult learners, which is also important to the current study. Second, the application of advanced technology in the teaching and learning environment (Theme 2) is directly linked to the provision of effective pedagogy in engineering (Theme 3). Furthermore, the application of new knowledge to the work environment (Theme 4) and students' development through practice-based experiences (Theme 5) are strongly linked to ELT. The findings of the study as depicted in Figure 1 reveal the importance of a strong pedagogical approach that provides a balance between theory and practice, the application of modern technology in the teaching and learning process and the transformation of students' learning experience through practice-based learning. This outcome further reveals that the development of the professional identities (Billett, 2015) and occupations of adult learners involves an interplay between concrete experiences, observations and reflection that are aimed at enhanced engineering practice.

Furthermore, we extended the significance of practice-based experiences from the development of the professional occupation (Billett, 2015) of adult learners to include a process of knowledge reconstruction and reflection (Usher, 2009; Cook-Sather, 2014) that connects their knowledge and skills expectations to those desired by industry. In complementary ways, transformation of the learning experiences of adult learners requires reflection both in and outside the learning environment (Morris, 2020), especially in the engineering workplace setting.

Study limitations and future research

The findings of this study should be interpreted in light of its limitations. First, although our discussion of the vocational and technical knowledge and skills framework was developed based on the experiential learning theory, other theories could highlight findings different from those that emerged from our study. Future research could explore the application of different theories to the development of the vocational and technical competencies of adult learners. Second, regarding the student respondents, this study relied on data from adult learners at three diverse universities. Future research could consider the views of traditional engineering students on the factors that are necessary for developing their vocational and technical competencies. Finally, the study focused solely on the development of the vocational and technical knowledge and skills of adult learners in engineering. Future research could examine the development of the vocational and technical knowledge and skills of adult learners in other disciplines.

Conclusion

We consider the findings of our study as appropriate at this time, especially when insufficient emphasis is placed on developing the vocational and technical knowledge and skills of adult learners in HEIs. Although on the global front, UNESCO's new strategy for TVET emphasises the promotion of quality lifelong learning opportunities for all as well as the acquisition of vocational and technical skills for employment, its implementation requires a robust framework at the institutional level. First, the current study showed that an effective pedagogical approach, the application of advanced technology, and practice-based experiences enhance the development of the vocational and technical knowledge and skills of adult learners in HE. The study also revealed some challenges confronting HEIs in Ghana with respect to the development of practice-based experiences for adult learners in the engineering discipline. These challenges include a lack of state-of-the-art equipment in laboratories, a lack of opportunities in the current curricula to respond to and fill real work-environment gaps, and what is required for the job setting. In addition, we purposely focused on adult learners in the engineering field in order to highlight those aspects that are relevant in developing the vocational and technical knowledge and skills of a workforce with a view to supporting Ghana's development agenda. Since the present practice of developing engineering programmes based on perceived industry needs alone cannot be sustained, it has become necessary to focus on other factors such as employability skills, advanced technology, and teaching and learning processes that support the development of the vocational and technical knowledge and skills of adult learners.

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TVET engineering students' perceptions of the value of their qualification and the prospects of employment

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ABSTRACT

The study described in this article explored the ways in which selected technical and vocational education and training (TVET) engineering students perceived their qualifications and employment prospects, given the youth unemployment rate in general and, in particular, that among TVET graduates. While the unemployment rate among South Africans with a tertiary qualification stood at 7%, it appeared to be a staggering 33% among TVET graduates in 2017. In order to gather data from a sample of TVET engineering students, a self-administered qualitative questionnaire was used to collect data from two colleges. A total of 113 TVET engineering students at the two colleges completed the questionnaire. The gender profile of the participants was 64 females and 49 males, who were all between the ages of 18 and 29 years. The findings showed that the TVET engineering qualification does not guarantee employment because of the lack of jobs in the South African economy. Moreover, the participants perceived unemployment as a function of job scarcity rather than of a lack of skills. However, some participants perceived a TVET engineering qualification to be in demand, and this demand is attributed to the electricity crisis/load-shedding in South Africa. The majority of the 79 participants, who perceived unemployment to be an economic crisis, recommended that a solution to unemployment should be to make voluntary service compulsory in both the public and the private sector. To this end, the government should make available funding for small, medium and micro enterprises (SMMEs) and also encourage and fund students to study beyond their undergraduate qualification. As an entry-level requirement for employment, experience is seen as an unfair practice and a barrier to entry for graduates.

KEYWORDS
Empowerment, TVET engineering qualification, skills, unemployment, youths

Background and context

Technical and vocational education and training (TVET) is seen globally as central to political reforms and social justice initiatives that target unemployment and economic development (Powell, 2014). Kraak (2018) has argued that, worldwide, TVET colleges are linked to globalisation, intermediary skills for human development and employability patterns that focus on the relevance of skills to labour market needs. In many African countries, governments emphasise and recognise the critical role of TVET in skills development and preparing young people for the future world of work (Afeti, 2018). However, in South Africa, despite the major changes that have occurred in the TVET sector since the emergence of the democratic dispensation in 1994, unemployment seems to be continually on the rise (Akoojee, McGrath & Visser, 2008). Moreover, in 2017, while the unemployment rate among South Africans with a tertiary qualification stood at about 7%, it was a staggering 33% among TVET graduates, some of whom have engineering qualifications (Prinsloo, 2011; Nkosi, 2017; Statistics South Africa, 2017). Statistics South Africa (2017) acknowledges that the level of unemployment among university graduates appears to be low compared to that of TVET graduates. Nkosi (2017) asserts that in South Africa the chances of a TVET graduate being unemployed are very high.

A study that evaluated the placement and employability of TVET graduates who had been part of the Work Integrated Learning (WIL) Programme in the Safety and Security Sector from 2015/16 to 2017/18 confirmed that TVET graduates are still finding it difficult to find employment, despite having experienced workplace learning (SASSETA, 2018:22). In 2011/12, there were about 600 000 unemployed graduates in South Africa, a third of whom were TVET engineering and science graduates (Prinsloo, 2011; Sharp, 2015). While thousands of other young South African graduates of various tertiary and post-school education institutions face the challenge of unemployment, TVET graduates may feel particular disappointment, since successive governments have placed hope in the role of TVET in developing skills for employment (Prinsloo, 2011; Nkosi, 2017). Prinsloo (2011) argues that although engineering and science graduates, especially those from TVET institutions, are given knowledge and some practical training, the majority of these students lack the necessary experience and training, ultimately leaving them unemployable and unemployed. The literature also seems to suggest that TVET colleges have limited equipment for practical training and a shortage of workshops for practical or technical skills training for students; their students therefore lack the technical expertise and industrial experience needed to meet the expectations of industry (Papier, 2017). As a consequence, these graduates require additional mentoring and supervision once they are employed (Papier, 2017; Legg-Jack, 2018).

This study was therefore conducted in an attempt to explore and understand TVET engineering students' perceptions of the value of their qualifications and their prospects of employment. Soliciting their views is critical, given that the frequent narratives or reports and the literature in general on unemployment and its causes tend to ignore the voices and

perceptions of students about their qualifications and employment prospects. Moreover, since unemployment in South Africa is prevalent among graduates, obtaining their views is critical to shaping public policy. The study employs the education and employment linkage (EEL) as a conceptual framework that informs and shapes it.

Research objectives

The research aimed to explore the ways in which TVET engineering students perceive the (dis)connections between their course programmes and their prospects of finding work. In addition, the study aimed to understand the reasons for their perceptions, in relation to youth unemployment.

Conceptual framework

The study is based on the concept of education–employment linkage (EEL) in TVET programmes (Rageth & Renold, 2019). According to this concept, when players from education and employment systems share authority over a particular TVET programme, the EEL is highest. Bolli, Caves, Renold and Buergi (2018) maintain that linkage is related to the participation of youths in the labour force. Moreover, Bolli, Egg and Rageth (2017) indicate that TVET programmes that enable or require students to spend at least 25% of their time in the workplace causally improve youth labour market outcomes, particularly in overall employment. In contrast, those programmes that enable or require students to spend less time in the workplace do not improve those outcomes for students.

Rageth and Renold (2019) identify three ideal models for linkages in TVET programmes. The first considers that power is typically shared in high-linkage networks. The other two models are low-linkage scenarios in which one system controls the majority of the power. For instance, employers have limited influence over curriculum content, programme delivery and curriculum updates. This is a policy issue in our context, one that makes it crucial to re-examine TVET curriculum development nationally to allow industries and TVET colleges to play a joint role in developing curricula and programmes. Renold, Caves, Bolli and Bürgi (2016) suggest that employer-dominated programmes may lack generic and transferable skills in the curriculum, that they may not include enough theoretical information alongside practical information, and that the programmes may be updated only when one specific job changes rather than to reflect changes at the occupational level. Therefore, in the case of TVET programmes, EEL is a useful concept with which to assess the relationship between education and employment. All TVET programmes at all levels of an education and training system, such as upper-secondary dual TVET programmes and various levels of post-secondary and tertiary professional education, are considered to be part of the trajectory that includes a TVET curriculum (Renold et al., 2016). Normally, each educational level has only one programme, whereas some countries offer many TVET programmes at a single level (Rageth & Renold, 2019).

Multiple curricula for diverse vocations are provided in TVET programmes, and the extent of the vocational curriculum varies widely across nations. For example, Finland's largest upper-secondary TVET programmes provide for eight disciplines, whereas Estonia has 657 (Renold et al., 2016). The EEL does not assess all the components of a TVET programme – only those that are related to the education–employment linkage. These components are determined by looking for every instance in which players from the education and employment spheres can interact or exchange power throughout the educational value chain (Rageth & Renold, 2019). Curriculum design, curriculum application programme delivery and curriculum updating are the three steps in the curriculum value chain that make up the index's three stages. For this reason, a nationally developed curriculum compiled with minimal input from other critical stakeholders in the sector is a limited product that needs to undergo reconsideration and revision by policy-makers if it is to fulfil the needs of both students and employers.

Education and training in developing countries

The EEL was developed and tested mostly in developed countries (Renold et al., 2016). Because the index is functional rather than institutional, it is context-agnostic in theory. However, in the developing world, one problem of special relevance is the rigidity of both the TVET curriculum and the labour market into which it feeds. In developing countries, non-formal and informal education and training are still widespread and constitute a significant way of obtaining information and skills (International Labour Organization, 2012). These avenues for skills and knowledge acquisition should be considered when authorities attempt to solve the problem of unemployment in these countries.

Formal, non-formal and informal learning

EEL is ensured if educational and employment systems are matched. However, these systems vary, and in the case of educational systems, they can be either formal, non-formal or informal. The technique of learning, rather than the degree or kind of information received, distinguishes formal, non-formal, and informal learning. However, definitions are often ambiguous and depend on the circumstances in which the learning takes place (Carron & Carr-Hill, 1991; Eshach, 2007). Formal training programmes, in general, are part of the formal education system, which is regulated by a curriculum and recognised by the country's education authority through certification (UNESCO, 2011). They must meet at least one established qualifying criterion and should consist mostly of classroom instruction; however, they might also consist solely of tests. They provide credentials that open up prospects for further study and training in the education and training system, making them appealing to students.

Non-formal training can consist of a class or a course that follows a curriculum but which is not part of the educational system or recognised by the educational authorities (UNESCO, 2011). Language programmes at a community centre and a variety of continuing education alternatives are two examples of non-formal training.

Informal learning occurs outside of the educational system and is usually unplanned and unintentional – it is simply experience-based knowledge. UNESCO (2011) suggests, for instance, that someone who learns a language through conversing with others who speak that language is doing so informally. Although informal and non-formal education and training are still characteristic of the systems of developing countries such as South Africa, in the present study, the researchers focused on formal programmes that are part of the education and training system identified through the case study of two TVET colleges.

Informal and formal economies

Labour markets can also be either formal or informal. The International Labour Organization (ILO) (2012), when explaining the informal economy, broadly indicates that it comprises those economic activities or markets that are – in law or practice – not covered at all or are inadequately covered by formal arrangements. An informal economy, moreover, is often characterised by a high prevalence of poverty, inequality and susceptibility to deficits of decent work. At the same time, the informal sector employs more than 60% of the workforce worldwide (ILO, 2018). According to Moodie, Wheelahan and Lavigne (2019:06), 'TVET plays an important role in supporting people in the informal sector in transitioning to the formal sector through ad-hoc training'. As a result, graduates of formal training programmes in Chile and Costa Rica often go on to work in the formal labour market (Medina, Jonelis & Cangul, 2016). Moreover, in Benin and Nepal, graduates in most instances end up in the informal sector because it employs between 65% and 80% of the entire workforce (Medina, Jonelis & Cangul, 2016).

In the South African context, the provision of TVET is formally designed at a national level to cater mainly to employment in the formal sectors of the economy, with little emphasis on preparing graduates to enter the informal sector. Perhaps this formalisation of TVET training to serve only the formal economy will have to be re-examined because the extent to which education (mis)matches affect the labour market is largely influenced by the pattern of linkages at the local, regional and national levels. In certain countries, education is mostly vocational and graduates are assigned to a limited number of jobs; in others, students are given broader degrees and employees are encouraged to move through the job market (both informal and formal) rather than follow a certain rigid path from formal schooling to formal employment.

Attending to structural differences is expected to have an impact on employment outcomes, which are likely to be more positive in countries where educational systems match specific professional roles. The risk of unemployment appears to be minimal when there are strong links between educational outcomes and occupational positions – which, in the case of the South African TVET system, appears not to be the case. Based on the experience of many TVET graduates, quite the contrary appears to be the reality. Consequently, educational routes should be realigned with particular employment opportunities in the workplace, especially in the field of engineering, which is the field of study and expertise of the students

participating in the present study. Therefore, we argue that re-examining and revising the core design of curricula and developing TVET curricula in partnership with businesses may serve to resolve some of the problems and barriers to entry graduates face when they attempt to enter the formal economy, especially as newly qualified engineers.

Research methodology

A qualitative data-gathering method was applied in this research, which was undertaken by employing a self-administered qualitative questionnaire that required participating students to express their views in response to a number of questions. The qualitative method was chosen because it usually aims for depth rather than quantity of understanding. Creswell (2002) and Henning (2004) both describe qualitative research as a set of methods for conducting research and as a set of beliefs about the knowledge of the world. Questions were piloted to test their reliability and validity. Twelve people were sampled in this phase; the purpose of the research was explained to them and their consent was obtained.

Participants were asked to complete the questionnaire which was to be used in the final study and to provide comments about the language, relevance and consistency of the questions. Eight participants completed the pilot questionnaire, the aim of which was mainly to test whether the language made sense, the questions were relevant and whether synergy, coherence or consistency were present throughout the questionnaire. The respondents all agreed that the questions were expressed in simple, plain and clear language, could be answered easily and were suitable for an empirical study. In seeking to understand the TVET engineering students' perceptions of their qualification and employment prospects, two colleges in the Eastern Cape were identified as case studies for this research. Babbie and Mouton (2001) define a case study as an empirical research enquiry that explores an existing phenomenon in its real-life context, especially when boundaries between the phenomenon and the context are not clearly articulated.

Sampling and data-collection procedure

Purposive and convenience sampling was employed to select the participants. As indicated, two colleges were chosen because they were conveniently close to the researchers' location, and one researcher had worked with the colleges on previous projects. Appointment dates to meet with students on each of the engineering campuses were arranged with the management of both colleges. During the meetings, the researchers briefed the colleges' management about the study and its objectives and permission was granted to conduct the research in both colleges. Moreover, it was planned that during each interaction with the students, one or two senior people – mainly college lecturers in the engineering department – would support the study and encourage participation. The participants were briefed about the study objectives, the importance of their participation (to which they willingly agreed) and management's support of the project. In addition, especially before being given the questionnaires, the participants were informed about their rights in the study process, that their participation

was voluntary and that they could withdraw from participating in the study at any time, without any obligation to provide reasons for doing so. They were also asked whether they had any questions, after which they were handed the self-administered questionnaire to complete.

A qualitative self-administered questionnaire was used to collect data from the participants because of its suitability for a study among an adequately literate population. The participants were expected to answer questions appropriately and present their views on the topic presented to them. Qualitative questionnaires are open-ended in nature and are used to gather data about people's beliefs, feelings and experiences concerning programmes, services and activities, for example.

In the present study, the open-ended questions were designed in such a way that the participants had the freedom to express their views in response to them, without any influence by or clues from the researcher. The questionnaire comprised four sections:

- high school background;
- current studies;
- the curriculum and knowledge required by industry; and
- employment opportunities.

A total of 200 students enrolled for various engineering programmes at the third-year level across the two colleges were included in the sample. All of them were given the questionnaire to complete, with each college participating on a separate day. Of the 200 participants, only 113 answered all of the questions, which determined the final size of our sample. The gender profile of the participants was 64 females and 49 males; their ages ranged between 18 and 29 years. They were all in their final year of study in their respective engineering programmes.

Data analysis

In social research, after collecting data, the researcher is responsible for transcribing the written responses for the purposes of in-depth data analysis in order to select and interpret the data that are useful for drawing and supporting conclusions about the research phenomenon. In the present study, the analysis involved coding and categorising the data according to emerging themes. This process of coding and clustering or dividing up data according to similarities and/or differences was followed by the interpretation of the themes according to further patterns that emerged to explain the phenomenon being investigated in more detail.

Therefore, thematic analysis – the process of segmenting, categorising and relinking data before final interpretation – was used to cluster the data that emerged from the present study into various categories that became the themes and sub-themes of the study. The clustering of the themes was critical to interpreting, explaining and discussing the results of the data analysis in the light of the participants' words that are quoted directly in this article.

Results and discussion

In the first instance, the results of the data analysis revealed divergent perspectives on the importance of a TVET engineering qualification. While the majority of the participants (79) reported that the qualification is undervalued and does not guarantee employment, another 34 participants maintained that it is in demand in the labour market. These views formed two of the four main themes that emerged from the data analysis:

1. There is a high demand for a TVET engineering qualification (the perception of 34 students).
2. A TVET qualification does not guarantee employment (the perception of the majority of the students, that is, 79).
3. A qualification counts for more than experience.
4. Job scarcity is more of a problem than a lack of skills.

Each of these is now elaborated upon.

There is a high demand for a TVET engineering qualification

The results of the data analysis showed that 34 participants perceived a TVET engineering qualification to be in high demand in South Africa. Whereas these participants acknowledged the prevalence of youth unemployment, especially among graduates, they were confident that with their TVET engineering qualification they would be employed. Participant 04, a 21-year-old third-year female student following a renewable engineering course at one of the TVET colleges, had this to say:

> There is a high demand for renewable courses in the mainstream economy and labour market, therefore getting a job will be easy. I am confident because our supply of electricity is under a lot of pressure; I think my skills will be in demand because there are not many electricians around, more especially in the Eastern Cape province.

The electricity crisis or load-shedding that is engulfing the nation is one finding that seemed to be a major reason for the students' perceiving their qualifications to be needed in the labour market. A participant expressed the following view:

> My engineering is equipping me with the necessary tools and skills to avert load-shedding affecting our shrinking labour markets.

Some of the participants indicated that solutions to the electricity crisis are wind energy, hydropower, solar energy and geothermal power and that these solutions involve skills which the engineering programme they had pursued had equipped them to be able to find or create employment opportunities. The renewable energy programme available at one of the TVET

colleges in the Eastern Cape appears to have given hope to these young students. Furthermore, the recruitment and training unit at the college, which often shares employment opportunities with the students, made the participants more confident about their employment prospects.

TVET qualification does not guarantee employment

In contrast to the view expressed above, 79 participants perceived that TVET qualifications in general do not guarantee immediate or direct employment after graduation. For these participants, the high level of unemployment in South Africa is a consequence of an economy that is not growing and therefore unable to generate more jobs, especially for the number of skilled people available. Participant 08, aged 22 years, mentioned the following:

> Renewable energy qualification has just been introduced in SA, so it will take a while for the job market to grow, and [it] will not be easy to get job … Besides, finding a job in South Africa is difficult, I have seen it before, some people they just do piece jobs, and they do not get jobs … they have graduated for, even with their engineering qualification.

This participant differed from others in the cohort, who asserted that the renewable energy course might lead to employment. They reported that because it is a new course and not known in the market, finding a job in this field was not easy in South Africa.

Furthermore, some students in the engineering stream reported that a qualification in itself is not enough. For instance, there is a process that a job-seeker must undergo in order to be trade-tested. Participant 27, a young female aged 23 years, supported the above perception, stating the following:

> An engineering qualification does not immediately lead you to employment; depending on the stream, you have to undergo the trade test, which in itself does not lead to employment.

This finding refers to apprenticeship training in South Africa – also known as formal dual-type training because it combines workplace and institutional learning in a national qualification. In the South African context, a Quality Council monitors the apprenticeship training programmes for Trades and Occupations (QCTO), whereas the National Artisan Moderation Body (NAMB) oversees the quality assurance of apprenticeships on behalf of the QCTO. TVET colleges supported by Sector Education and Training Authorities (SETAs) could assist graduates who have to complete additional work-based training components by facilitating linkages or partnerships with relevant companies that operate in a particular trade or field.

The essential need for networking with and connections in industry seems to be another reason why students perceived that a TVET qualification alone would not help them secure employment. Moreover, there was a view that most of the job advertisements in newspapers hardly ever stipulate a TVET qualification as a criterion for consideration, which in itself casts doubt on its value. Added to these factors, participant 41, a male aged 26 years, observed that TVET engineering students lacked employment opportunities in post-democratic South Africa because the economy was not growing:

> In a democratic South Africa, it seems getting a job whether qualified and educated is very difficult, especially if you come from a TVET College; and I know many students who did the engineering course and they are unemployed.

This is supported by the fact that an increasing number of graduates – even those with a university qualification – lack employment opportunities. As a result, the participants perceived their TVET qualification to be particularly lacking in value. This view was enunciated quite simply by participant 49, a female aged 24 years:

> Our course does not have that much value.

As has been explained in this article, although the students who participated in the present study held contrasting views on the TVET engineering qualification in relation to the world of work, the majority of them indicated that employment opportunities are hard to find in South Africa, particularly for those with a TVET qualification.

Make voluntarily service compulsory, funding available for SMMEs and encourage further study

Sub-themes of the abovementioned second main theme were these: make voluntary service compulsory; provide funding for small, medium and micro enterprises (SMMEs); and encourage students to study beyond an undergraduate qualification. In other words, those who reported that they were unlikely to find a job because a TVET qualification does not appear to have value or worth in the South African market and does not guarantee direct job opportunities proposed three solutions. First, the participants suggested that voluntary service should be compulsory for all graduates to enable them to gain practical training and exposure. This voluntary service, they suggested further, should be without payment or a stipend. Secondly, the participants suggested that SMMEs and cooperatives should be established as they could make a contribution to the economy. Such enterprises should be funded or supported in some way by the state to enable them to thrive. Finally, they recommended that students should study beyond their undergraduate qualifications to equip themselves with research expertise and skills and that the state should fund these post-graduate studies.

Qualification counts more than experience

Some participants reported that the requirement that graduates should have work experience is an unfair practice because a qualification is more crucial than experience. Moreover, they asserted, requiring experience of graduates is an unfair barrier to employment and should be done away with. In this regard, participant 21, aged 22 years, revealed this:

> Experience as a prerequisite for employment is unfair and a barrier to young people who have spent years getting qualifications.

Some of the participants remarked that a qualification equates to experience and therefore it should be sufficient to gain entry to the labour market. According to these students, the years of training and learning skills required to acquire a qualification should be considered sufficient experience for an entry-level job. Moreover, the participants maintained that a lack of soft skills – such as hard work, confidence, teamwork, honesty, determination and commitment – which are often reported as crucial to young graduates, should also not be a barrier to employment, as they are not taught in educational institutions. Participant 35, aged 27 years, mentioned that while soft skills are important elements,

> [t]hey should be secondary for employment purposes, with primary factors being qualifications.

As has been shown above, the term 'qualification' included in the above quotation was used interchangeably with the term 'skill' by students, such as participant 35, who perceived the qualification as providing sufficient experience and skills for employment. Although soft skills are crucial in the workplace and are a focus in the TVET system, students suggest that they should not be a barrier to employment, especially if a candidate has the necessary formal training.

Job scarcity is more of a problem than a lack of skills

The participants perceived that the shortage of work opportunities in the market is the main cause of unemployment, which was declared a national crisis by President Cyril Ramaphosa in his state of the nation address in February 2020 (South Africa, 2020:30). The participants observed that despite graduates having skills and qualifications, they remained unemployed because there are insufficient job vacancies. This observation that a lack of jobs is the problem, as opposed to a lack of skills, is consistent with the view expressed in the literature, which found that university graduates are less likely to be unemployed compared to TVET graduates (Nkosi, 2017). Participant 83, a female aged 28 years, mentioned the following:

> The only problem we are faced with is job scarcity contrary to skills scarcity and therefore unemployment affects not only the uneducated youth but also people

with education qualifications most from college and to a lesser extent higher education institutions.

This participant's remark is consistent with the assertion that the number of unemployed TVET graduates is increasing (Nkosi, 2017).

Discussion

The finding that the lack of work opportunities is due to the economy not growing is consistent with the emerging body of research which points to the fact that the economy is confronted with growth constraints, and consequently a lack of job creation (Motala & Vally, 2013; Allais & Nathan, 2014; Ngcwangu, 2014; Treat, 2014; Reddy, Bhorat, Powell, Visser & Arends, 2016:108). Moreover, contrary to much of the literature attributing unemployment to a skills shortage, the findings seem to contribute to a growing body of literature that points to the lack of growth in the economy as a major reason for the high level of unemployment in South Africa. In 2018, unemployment stood at 32,5% (Statistics South Africa, 2018:130).

The TVET engineering students' perception that the South African economy is not growing, and is therefore leading to high unemployment levels, is consistent with Allais and Nathan's (2014) assertion that South Africa's economy has experienced growth in joblessness since 1994, with employment having been more capital intensive than labour intensive in the years since then. Whereas a few participants perceived an engineering qualification as being in demand in South Africa, the majority of the participants reported that a TVET qualification does not lead to immediate or direct employment. Prinsloo (2011) concurs with the participants' assertion that the qualification does not guarantee employment, as students may lack the experience required by employers. There was consensus among the participants that South Africa is faced with a lack of jobs rather than a shortage of skills. In addition, the findings revealed that work experience demanded by employers impedes TVET graduates' employment prospects. Participants described this experience requirement as a barrier and an unfair practice that hinders TVET graduates' employment prospects, saying they cannot gain experience outside of on-the-job training provided by the very same industry that should absorb them in the future.

Conclusion and recommendations

Despite graduates from the TVET education sector finding it difficult to secure employment, TVET remains important to the economy of South Africa, not only for enabling young people to find employment but also for making it possible for them to create employment for themselves and others. Government should continue to place emphasis on TVET qualifications but should consider restructuring them in line with infrastructure development. Moreover, the TVET sector should collaborate with industry to create more opportunities by training young people interested in becoming plumbers, electricians, machine operators, carpenters, boilermakers, bricklayers and other artisans.

Linkages between colleges and industries are considered necessary to reduce unemployment. This may require rethinking the centralisation of TVET curriculum development and provision and affording companies the opportunity to contribute to curriculum development for TVET programmes. As elaborated on in the conceptual framework section, EEL that focuses on workplace needs is likely to improve the currently limited influence that industries or employers have on TVET curriculum content and updates, as well as on programme delivery. The alignment between education and industry will be more likely to lead to the work readiness required of TVET graduates and to closing the skills gap. Indications from the research are that the current TVET curriculum design model should be rethought or reformed, as nationally developed curricula within which TVET colleges play a limited role and which allow minimal input by the industries they are mandated to serve, are keeping college training programmes and work experience further apart rather than bringing them closer together.

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Promise and performance of gender mainstreaming at a Zimbabwean agricultural training college

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ABSTRACT

Gender equality in education and training can be achieved only if curricula at every level of the system become gender-sensitive. The present study examines the extent to which the milieu at one agricultural training college in Zimbabwe promotes the implementation of gender-sensitive training. The main investigative question posed was as follows: To what extent is the agricultural education and training curriculum used at the college gender-sensitive? By responding to this question, the study provided some response to the performance, challenges and prospects for gender mainstreaming in the college's agricultural education curriculum. Data for this study were generated by document analysis of policy, curricular and instructional documents, interviews with 12 college lecturers, four college administrators and selected final year students, and by lesson observations. The study revealed that while government, and to a lesser extent college policies, articulate the need for gender equality, little attention is paid to these invocations in practice. Likewise, agricultural education and training curricula, training techniques, learning-support materials and out-of-class activities reflect minimal attention to issues of gender equality. The article concludes by discussing possible interventions that correspond to these findings.

KEYWORDS
Gender equality, gender-sensitive curriculum, agricultural education and training, gender mainstreaming, learning support materials

Introduction and background to the study

The participation of women in technical and vocational education and training (TVET) is reported to be fraught with challenges, which have earned this sector the label 'the leaky pipeline' to symbolise the likelihood of women dropping out of higher academic and technical–vocational studies compared to the retention record of men (Bohmer & Schinnenburg, 2018:63). This is especially so for countries in the sub-Saharan Africa region (UNESCO, 2006). The drive to provide gender-sensitive curricula and instructional practices for TVET courses as possible solutions to this problem is a growing concern in both the global south and the global north. Dickens, Nhlengethwa and Ndhlovu (2019) maintain that the Sustainable Development Goals (SDGs), particularly through SDG 4, seek to ensure that inclusive and equitable quality education and training in all TVET learning institutions is the norm, not the exception. Specifically, SDG 5 seeks to achieve gender equality and the empowerment of all women and girls as it does for all men and boys (Dickens, Nhlengethwa & Ndhlovu, 2019).

Historically, in Zimbabwe, agricultural education and training has been the preserve of males (Mdege, Mdege, Abidin & Bhatasara, 2017). The post-1980 policies of expanded educational provision and global pressures for gender equality led to the increased participation of women in TVET programmes. The promulgation of the National Gender Policy (NGP) in 2004 and its subsequent revision in 2017 created a legal impetus for gender equalisation efforts. Consequently, this research examines how national efforts towards gender mainstreaming have been taken up in the curricular practices of one Zimbabwean agricultural training institution. The college is one of the many TVET colleges established by the government of Zimbabwe and administered by the Ministry of Lands, Agriculture, Water, Climate, Fisheries and Rural Resettlement, and it is situated in a rural setting. The college is a stand-alone institution, providing on-campus accommodation for all the 120 students, who comprise 60 males and 60 females when enrolled to full capacity. The college offers agricultural education and training to students in crop and animal husbandry, agribusiness management and agricultural engineering; it produces graduates destined to offer agricultural extension and technical services to farmers across the farming sector and other agro-enterprises. The students exit with either national certificates in agriculture after 18 months of training or national diplomas after three years of training. In this study, some sub-questions were also posed: What policy stipulations guide gender mainstreaming in agricultural education? What kinds of curriculum content and learning-support materials exist to support gender mainstreaming? How well do the instructional milieu and practices promote gender-sensitive training? Finally, do out-of-class student activities reflect gender equality? Each of these questions is responded to in this article.

Literature review and conceptual framework

Internationally, there is a growing corpus of scholarship that speaks to the issue of gender mainstreaming at the TVET and tertiary level, (Gollifer & Gorman, 2018; CUQAA, 2019).

However, few studies have examined the agricultural education curricula in sub-Saharan Africa in order to ascertain how well they do in fostering gender equality (Matenda, 2020).

A number of concepts central to this study need to be explained contextually as guided by the extant literature. The term 'gender' refers to 'roles and responsibilities of women and men that are socially rather than biologically determined' (Government of Zimbabwe and UNDP, 2009:vii). The notions of gender are context-specific and vary from society to society since different societies view gender through different lenses. Although gender is about women, girls, men and boys, the concern in sub-Saharan Africa and Zimbabwe, as in many patriarchal societies, has had to do mainly with girls and women who have historically been disadvantaged in many spheres of life. Another key concept is that of gender mainstreaming, which Frei and Leowinata (2014:108) describe as:

> a process of assessing the implications for women/girls and men/boys of any planned action – including legislation, policies or programmes – in all areas and at all levels. This includes creating and sharing knowledge, awareness [of] and responsibility for gender equality. It is also a strategy for including the concerns of girls/women and boys/men in the design, implementation, monitoring and evaluation of education policies and programmes so that girls and boys, women and men benefit equally.

This depiction of gender mainstreaming emphasises the need to integrate a gender-equality perspective at all stages and levels of policies, programmes and projects such as needs analysis, planning, designing, implementation, monitoring and evaluation with regard to how these affect men and women (Nabbuye, 2018; CUQAA, 2019; Chidarikire, Muza & Beans, 2021). In education and training, gender mainstreaming encompasses issues related to curriculum content selection, content delivery, organisation of teaching-learning processes, seating arrangements in classrooms, teacher attitudes, language use, teaching and learning materials, and assessment in the context of gender (Nabbuye, 2018).

Other terms that refer to gender mainstreaming include gender perspective and gender-responsive pedagogies, which relate to the adoption of practices attuned to the needs of girls/women and boys/men in education and training. CUQAA (2019:18) aptly sums the meaning of these concepts as follows:

> [W]hen applied to teaching, … [these concepts imply] … a process of reflection which affects the design of the competences and skills in the programme's curriculum, the design of courses, including learning outcomes, the content taught, examples provided, the language used, the sources selected, the method of assessment and the way in which the learning environment is managed.

The view of gender mainstreaming informing this study is of a liberal feminist extraction, given that the gender policies which express or espouse gender equality in Zimbabwe are

essentially liberal in outlook. Liberal feminists seek to equalise educational and training opportunities and provisions between males and females (Graham, 1994; Munsaka & Matafwali, 2013). The major assumption behind liberal feminism is that such equal access to education and training would eliminate the inequalities between males and females. This viewpoint stands in contradiction to that of radical feminists, who advocate an overhaul of the underlying socio-economic structures which they see as the cause of gender and other socio-economic inequalities (Graham, 1994). In educational provision, the liberal feminist perspective is therefore essentially seeking to equalise the former unfavourable provision of education and training for previously disadvantaged groups such as females. The possible foci of gender mainstreaming from this body of literature guided the conceptualisation of a theoretical framework highlighting four areas that can be targeted for gender mainstreaming in the TVET agricultural colleges' training curriculum and context, as shown in Figure 1.
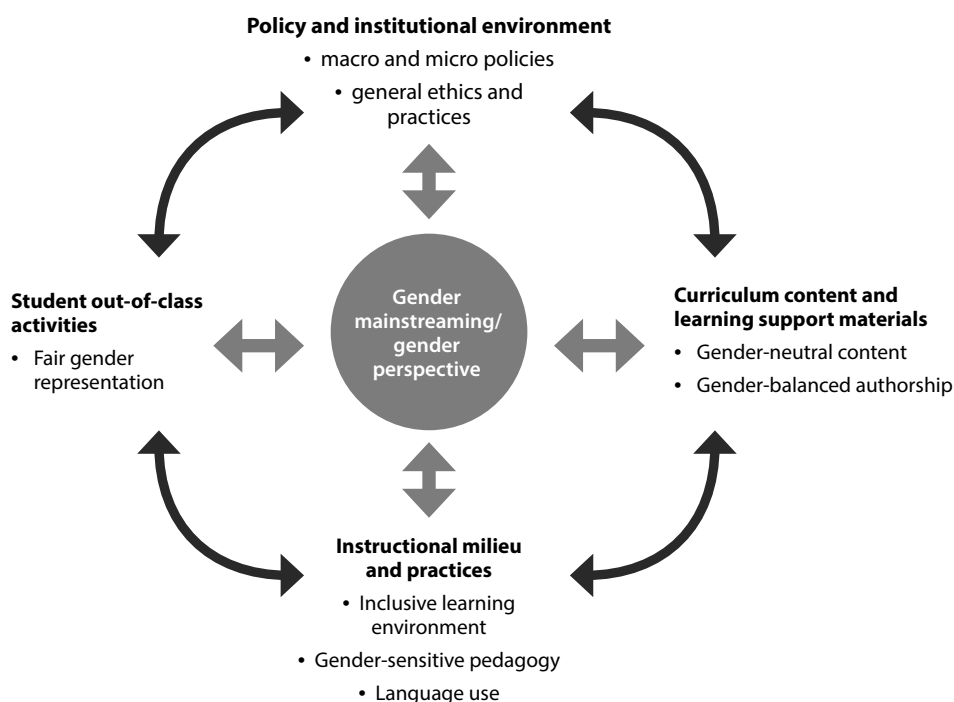
Figure 1: Framework for mainstreaming gender in TVET institutions (own elaboration)

The framework suggests that the gender mainstreaming process can target four interlinked areas in TVET, namely:

- the policy and institutional environment;
- curriculum content and learning support materials;
- instructional milieu and practices; and
- out-of-class student activities.

This organising frame was used to guide the research with regard to issues concerned with gender mainstreaming processes, and this article reflects this framing. To illustrate, in the area of curriculum content the specific agricultural topics or agricultural science disciplines which the cohort of students in the study had covered or were being taught would have to be investigated. Such disciplines, as advised by the Women's and Gender Research Network (Patel-Campillo & Reyes, 2015) could include horticulture, forestry, environmental science and farm management content. For this study, the disciplines were the eight modules studied by the final-term student cohort at the time of the study, as shown in Table 1.

Table 1: Potential of infusion of gender issues in study modules (adapted from Chinyemba, Muchena & Hakutangwi, 2006; Ministry of Lands, Agriculture, Water, Climate, Fisheries and Rural Resettlement, 2012)

MODULE STUDIED	POTENTIAL GENDER ISSUE FOR INCORPORATION (AS IDENTIFIED IN EXTANT LITERATURE)	INFUSION OF GENDER ISSUES FOUND
Land-use Planning	Need for engendered extension services that are female-centred and biased towards female enterprises. Skewed allocation of resettlement land, e.g. in 2003 only 12% of A2 (around 300 ha farms) farmers were female, while in 2014 only 20% of A2 farms was reserved for females in Zimbabwe. By 2018 only 10% of all the land under the land reform programme went to women, falling short of the 20% quota stipulated in Zimbabwe's Constitution (IFAD, 2018).	Only passing reference to gender ratios in land resettlement process.
Project Development	Need for appropriate and gender-sensitive enterprise ownership, e.g. from 2000 onwards around 17% females had access to credit lines compared to 68% males.	No reference found.
Oil Seeds	Some oil seeds are home-processed into oil and foodstuffs by females, i.e. value-addition and household food security. *Women as farm managers, food producers, but little recognition.*	No reference found.
Plantation Crops	Females tend to be squeezed out through commercial crop production and land tenure considerations. Appropriate and gender-sensitive extension services, financing and marketing services are needed. *Women as farm managers, food producers, but little recognition.*	No reference found.
Farm Machinery	Appropriate gender-sensitive technologies and training. Most technologies are based on masculinity, so women cannot easily use them in agriculture. More than 50% of agricultural tasks are done by women – a case for labour-saving technologies. *Women as farm managers, food producers, but little recognition.*	Reference made to female dominance in communal agriculture only.

Table 1: Potential of infusion of gender issues in study modules (adapted from Chinyemba, Muchena & Hakutangwi, 2006; Ministry of Lands, Agriculture, Water, Climate, Fisheries and Rural Resettlement, 2012)

MODULE STUDIED	POTENTIAL GENDER ISSUE FOR INCORPORATION (AS IDENTIFIED IN EXTANT LITERATURE)	INFUSION OF GENDER ISSUES FOUND
Irrigation	Allocation of irrigable land favours men or male-headed households, and the control of land in turn means control of water resources for agriculture. *Women as farm managers, food producers, but little recognition.*	Technical issues covered such as types, physical conditions for irrigation.
Beef Production	Cattle ownership remains the preserve of men and this means men control the wealth, means of production and decision-making. Women should benefit from the government's restocking initiatives through bank loans to enable them to own cattle.	Little reference to female participation in beef production.
Ranch Land and Wildlife Management	More women should be assisted financially to venture into wildlife farming and to acquire foreign currency.	No mention of gender issues.

A number of terms that are frequently used in this work require contextualised explanations; they are in the main guided by the meanings given by the European Institute for Gender (EIGE) (nd). The term 'gender issue' refers to aspects and concerns related to women's and men's lives and situation in society with regard to the curriculum of agriculture disciplines at the relevant college. Examples are the participation of women and men in forestry, crop production or land ownership and how they access and use resources such as land, irrigation water and agricultural finance. A gender-sensitive curriculum is one that considers the particularities pertaining to the lives of both women and men, with the aim of eliminating inequalities and promoting gender equality – such as equal distribution of agricultural resources between the genders. The concept 'gender-neutral' relates to agricultural training processes such as content, language or media use that are not associated with either women or men.

Research methodology

A qualitative case-study design was used in controlling the research situation and for generating data at the agricultural college that is the subject of this study. The data-generating techniques considered apposite for studying the college's gender mainstreaming efforts were observations, document analysis of policies, curriculum and instructional materials and informant interviews. Each of these techniques is now described.

Observations

Participant and non-participant observation was used as a way of generating data. Part of the observation was from a participant 'insider position' by one member of the research team, who was a senior member of the college management committee at the time of the research. This 'insider position' allowed a degree of what Davies (1999) calls 'reflexive ethnography' that generated emic views on gender mainstreaming in administrative activities, out-of-class student activities and classroom transactions at the college. Participant observation was augmented by non-participant observation of training sessions. This offered opportunities to witness and understand underlying attitudes, behaviours and communication related to classroom interactions.

Document study

Document study allowed for various written documents to be analysed with a view to teasing out their coverage of gender mainstreaming. The studied documents included the National Gender Policy (NGP), syllabi or trainers' course outlines, content modules, and other learning support materials (LSMs) such as textbooks. An analysis of these documents made it possible to establish the extent to which gender mainstreaming is supported and promoted by the institution and its programmes.

Interviews

Another method used to generate data was interviews with key informants, namely, the college principal and the vice-principal and three of the 12 lecturers, who were conveniently chosen as information-rich sources. Furthermore, informal interviews were conducted with two other lecturers and five student trainees. Informal interviews sought to solicit the views of lecturers and students on certain observed issues. The use of informal interviews or unstructured chats was considered to be a means through which trustworthy information could be obtained by a member of the research team who was working at the college. It was therefore possible to triangulate data from a variety of sources and interventions, such as observation and document study.

Ethical issues

Permission to conduct the study was obtained from the Zimbabwe Ministry of Lands, Agriculture, Water, Climate, Fisheries and Rural Resettlement with the mandate to train agricultural extension personnel. Informed consent was then sought and granted by the college administration, the teaching staff and the student trainees prior to their participation.

Research findings

In presenting and analysing the research data, evidence from several data-generating tools was brought together to deal with each of the four sub-research questions framing the research. This use of multiple sources of evidence afforded the researchers a measure of data triangulation, which in turn strengthens the trustworthiness and soundness of findings. The data are presented as descriptive accounts backed by supportive excerpts and figures, where this is possible.

Policy stipulations that guide gender mainstreaming in Zimbabwean agricultural education

The study scrutinised documents relating to a number of policy stipulations so as to assess how such stipulations created a predisposing policy milieu for gender equality at the agricultural college being studied. In all, four types of documents were analysed, namely: (i) Zimbabwe National Gender Policy (ZNGP), (ii) the college's course syllabi, (iii) the study modules taken by the student cohort under study, and (iv) texts and sources, course outlines and trainers' or lecturers' teaching-learning materials, where these were available.

National gender policy

From a study of the NGP, a number of requirements emerged on gender mainstreaming in Zimbabwe generally. The NGP was first launched in 2004 and subsequently reviewed in 2017. A study of the NGP highlights strategies for gender-sensitive practices and a reduction in gender inequalities in education and training. The NGP fosters a coordinated policy implementation approach. In a speech to launch the 2017 edition of the NGP, on 16 July 2017, the then chairperson of the Zimbabwe Gender Commission stressed the need to 'ensure that the issues raised in the revised national gender policy are implemented by all relevant government ministries, parastatals and departments' (UNDP, 2020:np). This call was an open invitation to all and sundry in Zimbabwe to mainstream gender in their activities. The strategies proposed for gender mainstreaming in the education and training sector policies and programmes apply equally to agricultural education and TVET. The strategies put forward by the NGP (2004) require action in the following six thematic areas (GOZ & UNDP, 2009):

- Amend all relevant education and legal instruments to promote gender equality and equity;
- Incorporate gender issues in all curricula at all levels of education;
- Eliminate all forms of discrimination against boys and girls in education and skills training, including in Science and Technology;
- Provide equal and equitable educational resources to women and men at all levels;
- Ensure that the sexes are equitably represented, including through the appointment of more competent women at decision-making levels in the education sector; and
- Introduce gender-awareness programmes in training courses.

The evidence from the study of the NGP and its stipulations, when juxtaposed against what was on the ground, is best represented in the following interview responses by senior college personnel. One line of enquiry pursued with the senior college staff was about their knowledge of the existence of the NGP. The vice-principal's response was:

> Yes, we have heard of the existence of the NGP. However, at college level I can't say we are using it to influence our programmes. Our knowledge of what is required is not enough.

Asked about what the college was doing to mainstream gender issues in line with NGP imperatives, the college principal said the college was 'yet to be provided with a clear lead on this process' from the Department of Agricultural Education and Farmer Training. This department falls under the Ministry of Lands, Agriculture, Water, Climate, Fisheries and Rural Resettlement, whose mandate is to review the agricultural education and training curriculum. These responses by local senior college personnel, when juxtaposed against the policy stipulations on gender as encapsulated in the NGP, led to two conclusions. First, although gender mainstreaming has been embraced at a policy level, it was yet to spread to the local level. Second, higher-level involvement is absent in processes such as staff induction to ensure that the policy is implemented at the lower levels.

Broad curriculum goals and course objectives

A curriculum document has, as part of its attributes, to state the broad purposes of a course in the form of goals. The attribute of objectives serves to make the goals implementable through specified actions that have to be performed in order to attain the goals. A document study of the recent eight modules taught and studied by the final-year student cohort during their January to April college semester showed that none had explicitly stated goals and objectives pertaining to gender. Their absence would, at best, suggest that content that is gender-neutral or which by any standard implies a measure of gender equity is not being considered or embraced, since there is no implied bias towards any particular gender. This lack of focus on specific gender issues was similarly confirmed through interviews with lecturers teaching these modules. In the words of lecturer 1:

> We generally do not include gender-related goals and objectives since the course objectives do not explicitly require us to talk about gender issues […] Thus, we only concentrate on achieving the intended objectives which are examined at the end of the course.

Although the lack of gender-related goals and objectives can be taken as prima facie evidence of gender equity or neutrality, we contend that it represents what Dorney and Flood (1997:72). have termed 'silences in the curriculum' on gender which vitiate a change of practices in line with the NGP requirements. These findings are in line with Verge, Ferrer-Fons and Gonzalez's (2017) analysis of the syllabi of all the courses of the BA Political Science

at the International University of Catalonia in Spain, which is that gender issues were dramatically absent from the curriculum as only three per cent of the courses listed in the syllabi dealt broadly with issues of gender. Any envisaged change of practices would have to be clearly articulated or enforced from above, otherwise lecturers simply do what is expected of them, that is, teach that which is to be examined at the end of the course.

College course materials, syllabi and study modules, other LSMs, texts and sources

The kinds of curriculum content and LSMs available to support gender mainstreaming for the final-year student cohort targeted by the study were scrutinised. The study of the availability and adequacy of gender-sensitive content in course materials was also supplemented by interview data from lecturers and students. Gender-sensitive materials or practices are taken to be gender-neutral content or practices that refrain from discriminating against or stereotyping students on the basis of sex or gender. It is important to note that traditional subject curricula may contain 'silences' on gender which the teacher needs to be able to question.

Table 1 illustrates aspects of the content which the eight modules studied could have touched on in specific lessons or lectures. They are based on suggestions by Zimbabwean scholars in the area of gender and agriculture such as Chinyemba, Muchena & Hakutangwi (2006). The 'Infusion of gender issues found' column refers more to practices to do with the incorporation of gender issues into some module lessons. This column summarises the overall verdict of the interview responses and the researchers' scrutiny of lecture notes, which give an idea of the state of the infusion of gender issues in the module notes. The table shows that the infusion varied from little to no infusion at all. In addition, interview data corroborated these patterns of infusion. One lecturer's observation, when referred to Chinyemba, Muchena and Hakutangwi's (2006) work on agricultural topics with the potential to carry gender-related content, was indicative of the fact that many areas of agricultural content show that agricultural practices are biased towards males. This bias can be evidenced in such issues as women's access to and ownership of land and draught animals. The researchers' observations revealed that coverage of and emphasis on these practices and issues depended on the lecturer who was teaching the module. There was no coordinated effort to interrogate these issues systematically.

In addition, the cohort of students studied, being in their final term, could be expected to have covered some aspects of gender in other earlier modules. The research also worked on a general understanding that the depth of coverage of gender issues is bound to vary from one topic to another since the ability of each to carry gender content would vary.

The main LSMs were scrutinised to assess their coverage of gender issues. A number of the main textbooks used in some of the modules studied were also scrutinised. Our findings are presented in Table 2.

Table 2:   Some of the modules studied, the main textbooks and coverage of gender issues

MODULE	TEXTBOOK USED	COVERAGE OF GENDER ISSUES
Project Development	Downey, D & Erickson, S. 1987. *Agribusiness management* (2nd ed.). Hill, B. 1990. *An introduction to economics for students of agriculture.* (2nd ed.).	A very technical coverage with no gender issues.
Beef Production	Dalton, C. 1991. *An introduction to practical animal breeding* (2nd ed.). Lawrie, RA. 1991. *Meat Science* (5th ed.).	No coverage of gender issues.
Oil Seeds	Bowman, BA & Russel, RM. (Eds). 2004. *Present knowledge nutrition* (9th ed.). ILSI.	No reference to gender issues.

Table 2 shows that the texts emphasised a technical content coverage which made no reference to gender issues in the agriculture and science disciplines. This can be considered a gender-neutral curriculum that does not pit males against females or vice versa. In this regard the textbooks may be considered gender-neutral. There is, however, a view expressed by Cassese and Bos (2013) that there may be a technically biased coverage that perpetuates hidden curricular messages conveying scientific authority as being intrinsically technical, if not male. This also excludes the social basis of agricultural science with the capacity to take on board gender perspectives. Such silences on gender issues in textbook content suggest the need for a review of curricular materials so as to render them gender-sensitive. Alternatively, lecturers would need to infuse gender content into their teaching to make up for its lack of coverage in textbooks. The question of whether they have the capacity to do so is answered in the ensuing section.

Instructional milieu and practices that promote gender-sensitive training

The study sought to establish whether lecturers had the requisite content and pedagogical grounding to teach gender issues effectively. Consequently, the study interviewed lecturers to gauge their understanding of gender mainstreaming. The interviews with the lecturers revealed that only one out of 12 lecturers had had any formal exposure to gender issues in agriculture, and that was through a workshop he had attended. Furthermore, only one of the 12 lecturers was female, a situation which shows an acute lack of women's representation at this level of training; this despite the fact, ironically, that the male to female student ratio at the college was almost equal. A typical perception of gender mainstreaming held by the lecturers was evident in the words of one male interviewee, who said: 'We do practice gender equality since there is affirmative action which favours female applicants.' Like the college administrators, most lecturers were quick to associate gender equality with affirmative action linked to student recruitment and admission processes. However, such gender equalisation efforts were not evident in other areas of college life. This failure to apply issues of gender to other areas of college activity was compounded by the fact that the college had not held any

workshops to induct or sensitise its staff on gender issues. The recruitment of more female lecturers together with gender-related induction for staff could have enhanced the implementation of a curriculum in line with NGP policy stipulations.

Instructional methods used during teaching and learning

The study examined the instructional approaches used by lecturers to gauge their potential for fostering gender equality. Lesson observations showed that lectures, demonstrations and practical work were the most frequently used methods. During interviews, the lecturers indicated that they felt comfortable with these methods. Some lecturers observed that these methods enabled a quicker coverage of the training syllabus. The advantages of familiarity with the methods, easier management of a large student body and cost-effectiveness in terms of time and resources were also proffered as reasons for preferring these methods. During interviews with the lecturers on the methods they used in teaching it was noted that most lecturers were not comfortable discussing the details of their teaching–learning methods. This was apparently because most lacked a deeper understanding of the pedagogical and/or andragogical issues that underpin teaching. Eight of the 12 lecturers had no teaching or training qualifications, although they had obtained either a diploma or a degree in Agriculture. This most probably explains the limited use of what the literature calls 'the more interactive methods' such as discussions, drama, role play, group tasks, seminar presentations, field trips and the use of role models such as the Women's and Gender Research Network (Patel-Campillo & Reyes, 2015). Such methods would ideally combine, all things being equal, with other factors, such as gender-sensitive content and LSMs to foster gender-sensitive training (Patel-Campillo & Reyes, 2015).

Language use during instruction

Language use during instruction was studied through our observations of lessons or lectures. Excerpts and descriptions of observed classroom interactions highlight the salient features of language use, associated attitudes and reactions to classroom exchanges. Most lectures were teacher-dominated, question-and-answer sessions. Male students were more frequently chosen to answer questions as they tended to raise their hands more often. Consequently, male students dominated class discussions and were generally more vocal than their female counterparts. In most of the lecture sessions observed, it was noted that male lecturers neither encouraged females to participate in class discussions nor used gender-sensitive language. This is borne out by the episodes described below.

In one incident, a male lecturer was conducting a lecture and was mostly selecting male students to answer his questions. In the process, he posed an open, non-directed question to which a female student gave an answer that was inaudible to the instructor. In responding to this rare contribution from a female student, the lecturer said: '*Ko chimbuya chiri kuda kuti chinyiko?*' (What does the grandma (old lady) want to say?) This remark was met with laughter from most members of the class. It was observed that the male members of the class,

in particular, gleefully applauded this remark. To the observing non-participant researcher the remark proved to be condescending and derogatory, a view also affirmed in a follow-up interview with female student X. When asked how she felt about the incident, the female student X told the researcher–observer:

> It was a very disparaging remark. Anyway, we are used to this kind of language in our classes. The overall effect, however, is that female students keep quiet because this kind of language discourages us (females) from making contributions in the class. *Toita sei tichida chitupa*? (What can we do? We need the qualification!)

For his part, in a follow-up interview to explain his use of language in this incident, the lecturer said:

> Well, I meant no harm really, only to provide some lighter moment. The class generally enjoys these kinds of jokes.

A similar incident was witnessed in yet another lecture, where a different male lecturer who was allocating practical assignments to both male and female students remarked, with regard to the set submission date:

> *Handina basa nekuti unoyamwisa, ndoda kuti basa rangu riitwe ripere nenguva yakatarwa.* (I do not care whether you are breastfeeding or not, I want my task completed within the given timelines.)

A more gender-neutral use of language could have been along the lines of 'I do not care what circumstances you are in, I want my task completed within the given timelines.' In follow-up interviews with the female students of this class, the general response was encapsulated in a respondent's remark:

> The end is what we look at – that is, completion of the programme. This abuse is a passing phase. However, when delivered in Shona, some of these comments are at times painful! We need to be respected like any other human beings and not necessarily because we are women.

Follow-up interviews with female students about how they experienced these instances of language use yielded a consensus that they were generally on the receiving end of insensitive language use by male lecturers. The students felt that the remarks were more painful since they were delivered using the mother tongue (L1), Shona, which amplified the cultural and personalised meanings of being targets of sarcastic humour.

These two incidents underscore the use of inappropriate language towards female students in lessons where male lecturers were apparently oblivious to the negative effects of their choice of language. The female students felt that more gender-sensitive language could have been

adopted in these instances more out of respect for their feelings as human beings, than because they were women.

We contend that while these instances represent cases of sexual harassment and sexist language that could be dealt with accordingly, they were manifestations of situations in which gender-neutral practices were not being widely mainstreamed. The cases perhaps also underscore the importance of the universally accepted axiom of simply treating other human beings with respect as a way of ensuring respect all round. Furthermore, the female students felt powerless to do anything to redress the situation and were generally resigned to such abuse while holding on to the more important hope of completing the course. Such use of gender-insensitive language puts into question the form or lack of professional preparation these TVET lecturers receive for their job.

These findings on instructional techniques and language used by trainers in training sessions suggest the need for a policy on the professional preparation and development of TVET lecturers through a formalised pathway rather than leaving it to colleges and universities alone to play that role. This is a route which the Department of Higher Education and Training (DHET) in South Africa has pursued to good effect (Van der Bijl & Taylor, 2020).

How out-of-class student activities reflect gender (in)equality

In the out-of-class college environment, sporting activities were examined as possible pointers to gender-sensitive practices in the college. These aspects of college life constitute hidden curriculum attributes which, although not part of the formal classroom-planned transactions or studied content, are important indicators of gender-sensitive practices. The focus on out-of-class activities for a college that provides campus accommodation for all students was important since there was a need to study this college community holistically.

Out-of-class student activities

The study examined the ways in which out-of-class student activities reflected the gender perspective. The major out-of-class social activities observed were drinking at the local recreational club, religious gatherings, dating or courtship and participation in environmental outreach programmes. Observations made about the college's out-of-class environment showed that the majority of male students chose to patronise the recreational club, on which they converged for occasional alcoholic and non-alcoholic drinks. It was also observed that the few potential female student patrons who chose to take alcoholic drinks did so in private. Interviews with some of these female students disclosed that they did this out of fear of stigmatisation or being labelled as prostitutes. These female students alleged that such stigmatisation derived from widely held socio-cultural beliefs in traditional society in Zimbabwe.

It was observed that more female students chose to attend church and religious gatherings compared to male students. Another observed contrast between male and female students

was their dating patterns. It was observed, and also confirmed through interviews, that male students could easily date more than one female student at a time without the practice being frowned upon. However, it was considered 'taboo' for a female student to date more than one male student at a time. Such gendered attitudes to socio-cultural activities were matters of individual choice which may, however, have been a reflection of wider social-cultural practices.

These patterns of entertainment, participation in religious worship and dating observed at the college were generally a reflection of those common in the wider Zimbabwean society. The generally patriarchal nature of Zimbabwean society would probably explain some of the gendered practices observed in out-of-class activities at the college. However, an exception was the equal participation of both males and females in the college's environmental outreach programme, where students were required, as part of their training, to engage in community environmental awareness education of their choice. These patterns of out-of-class activities are significant to the study because they enable one to judge the holistic nature of gender-related issues at this particular college.

Dress code

Both male and female students were required to wear work suits, safety shoes or gumboots and sunhats while on campus or engaged in official training business. On other occasions, the students could dress the way they liked: the way men and women dressed reflected individual choices and perhaps the cultural meaning that individuals attach to dress. For example, it was observed that the students tended to associate different types of dressing with different occasions, whether religious, social, sporting or professional. Overall, this choice of dress on such occasions gave women and men some freedom, which it can be argued reflected gender equality.

Allocation of duties outside the classroom

Findings regarding the allocation of duties outside the classroom showed that duties and responsibilities were highly gendered. All the students were expected to take part in the general development and cleaning of the college premises on Wednesday afternoons. Female students were usually assigned cleaning duties in the college administration block, the hostels, the dining hall, the lecture rooms and the toilets. In contrast, male students were allocated labour-intensive tasks such as cutting firewood, cattle-dipping, branding and de-horning of animals, tractor driving and bush clearance. The allocation of duties reflected the societal practices of the gendered distribution of duties and tasks.

Participation in sport and recreation activities

It was observed that participation in sporting activities was a matter of individual choice and tended to be along gender lines. For example, soccer, darts and chess were for men, whereas

netball was the preserve of women. Sporting disciplines such as athletics and volleyball were for both women and men.

Discussion and conclusions

The NGP, through its 2004 and 2017 editions, requires ministries, departments and institutions to mainstream gender in their activities. This research sought to ascertain how this government policy of gender mainstreaming has been implemented in Technical and Vocational Education and Training (TVET), with particular reference to one Zimbabwean agricultural college. The study sought to ascertain *to what extent the agricultural education and training curriculum followed at a Zimbabwean agricultural college is gender sensitive.*

The study concluded that gender has not yet been adequately mainstreamed into the college with respect to the agricultural education and training curriculum, LSMs, training methods, classroom interactions and language use, and out-of-class student activities. These findings were arrived at and are presented here against a backdrop of existing pro-gender legal and policy frameworks, namely the National Gender Policies of 2004 and 2017. The situation at the college underscores the inadequate guidance, advocacy and information for enacting gender mainstreaming that pertains at a local level. Furthermore, this scenario reflects the limited translation and articulation of national policy downwards through ministerial, departmental and college levels for the requisite enactment of gender mainstreaming. The paradox of the existence of national policies on gender mainstreaming, on the one hand, and the lack of implementation at a local level, on the other, would suggest that colleges such as the one in this study have to be enabled to 'walk the talk'. This injunction may entail offering specific guidance plus allocating financial and human resources to institutions in the education and training sector to enable them to implement national gender mainstreaming efforts effectively. The findings suggest that local actor training and induction are essential to ensuring effective gender mainstreaming. Put differently, the prospects for successful gender mainstreaming in agricultural education specifically, and in TVET generally, depend in part on proactive local initiatives that have the backing, where possible, of external support.

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EDITORIAL POLICY

The Journal of Vocational, Adult and Continuing Education and Training (JOVACET) recognises the need for critical engagement through studies in TVET and Adult and Continuing education and training, and for encouraging critical scrutiny of this expansive knowledge area on the African continent.

The voices and experiences of practitioners, reflecting on all aspects of teaching and learning within vocational education and adult education settings, should be heard through publication of empirical and robust research. While the journal clearly wishes to take forward academic scholarship, it also seeks to strengthen opportunities for reflective practice that makes a scholarly contribution to the field. New knowledge emerging out of complex developmental contexts has significant value and needs to be show-cased beyond existing geographical and political boundaries. The journal is therefore committed to also supporting the development of emerging researchers by providing them with a space to present and defend their research amongst a network of global scholars. Within the field of vocational and continuing education there is substantive 'grey literature' that remains in project report form. The journal is potentially a vehicle for the translation of this important work into an academic contribution to a wider community of practice and thereby enhancing its value.

JOVACET will initially appear at least once a year. Unsolicited articles are welcome for consideration and should be uploaded onto JOVACET's website online journal or else emailed to the journal's administrator, Cathy Robertson, at cathy@tcrobertson.co.za.

The editor(s) are accountable for everything published in the journal and should therefore:

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The editor(s) will not disclose any information about the submitted manuscripts or their authors to anyone other than the author(s) and reviewer(s), as appropriate. The editor(s) will not use submitted material in any way whatsoever without the written consent of the author(s).

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Submissions may not exceed the 8 000-word limit and must contain a title, abstract of not more than 200 words and be correctly and completely referenced according to the Harvard system of referencing. Footnotes should be kept to a minimum. Tables should be positioned where they are referred to and not be submitted separately. Authors are requested to consult the author's guidelines on the website.

The article should not contain any identification of the author and should be anonymised as far as possible. The name(s) and affiliations of the author(s), as well as their email address, should appear on a separate page.

The Journal of Vocational, Adult and Continuing Education and Training (JOVACET) is an open access, peer-reviewed journal committed to disseminating the latest research in post-school education to the global community as widely as possible. The journal content is freely and openly available after publication on the website, www.jovacet.ac.za, and can be read, downloaded, copied, distributed and printed without asking prior permission from the publisher or the author.

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VOLUME 5, ISSUE 1

You are invited to submit an article for the fifth volume of JOVACET to be published in October/November 2022. JOVACET is an accredited publication with the Department of Higher Education and Training.

Articles should be topical with regard to current debates/discourses and recent research in the TVET, adult, and continuing education and training domains. Submissions should be of high quality and follow academic research/writing conventions of journal articles in the social sciences. Specifications can be found on the JOVACET website (www.jovacet.ac.za) or obtained from Dr Catherine Robertson at **cathy@tcrobertson.co.za**.

Articles should comprise a maximum of 8000 words, which include the abstract of approximately 200 words and a list of references, and be submitted in MS Word format via the journal website at www.jovacet.ac.za or emailed to Dr Catherine Robertson at cathy@tcrobertson.co.za. Kindly follow the style guide which is provided on the website.

We look forward to receiving your submissions!

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Recognition of Prior Learning (RPL), referred to, inter alia, as APL in other contexts, has been recognised by South African and international policies as a critical means of access to, and certification of further and higher learning, especially for mature learners. While there is general acknowledgement of the importance of RPL for lifelong learning and social inclusion, learning institutions have not embraced RPL equally across the board, and implementation practices vary greatly, often leading to learner frustration. While there have been some local studies and a growing international literature, RPL is by and large under-researched in South Africa.

In light of the above and its long tradition of RPL provision, the University of the Western Cape's Recognition of Prior Learning (RPL) unit will be hosting a conference on 30 and 31 March 2022, with the theme 'Implementation, Assessment and Articulation of Recognition of Prior Learning'. As one of the intentions of the conference is to 'build the scholarship of RPL' (also known as APL in other contexts), JOVACET will be partnering with the UWC RPL Unit to produce a Special Issue of the journal in 2022 for publication of relevant papers that fall within the scope of our journal.

Topics broadly covered by the conference include (but are not limited to) the following:

- RPL policy research
- Sharing RPL practices
- Capacity building for RPL
- Innovative RPL models
- RPL assessment for undergraduate and postgraduate access in higher education
- Articulation models for RPL in post-schooling

Submissions for paper presentations at the conference should be made directly to the conference organiser, Dr Rekha Rambharose, email rrambharose@uwc.ac.za, but additional, relevant topical papers seeking publication in this JOVACET Special Issue may be directed to Dr Catherine Robertson, email **cathy@trobertson.co.za**.

Please note that **all submissions** considered for publication, whether presented at the conference or not, will undergo the JOVACET double blind review process towards publication in November 2022 or earlier if possible.

Due date for full paper submissions (Special Issue): 30 April 2022

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