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Towards a framework of pedagogical content knowledge in Entrepreneurship Education for Technical Vocational Education and Training College lecturers

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Abstract. This study presents an intervention to design a framework to empower entrepreneurship education, Technical Vocational Education and Training College lecturers. The study is couched in the Critical Emancipatory Research paradigm whose criteria for quality are determined on the basis of advancing the agenda for equity, social justice, freedom peace and hope. The literature on Pedagogical Content Knowledge in entrepreneurship education is used to understand the challenges confronting the lecturer. The participatory action research approach was employed to generate data from discussion, class visits and meetings to understand and design a framework for effective teaching of entrepreneurship. The participants consisted of entrepreneurship lecturers, a parent, students, head of department and a local businessman. The data was collected from a series of meetings, discussions and workshops. The findings reveal that Technical Vocational Education and Training College lecturers lack pedagogical content knowledge. Therefore, a framework for teaching entrepreneurship is presented.

Keywords. Pedagogical Content Knowledge, Entrepreneurship Education, Technical Vocational Education and Training College, Critical Emancipatory Research, Participatory Action Research, Social Constructivism

Introduction

This study aims to design a framework of pedagogical content knowledge (PCK) in entrepreneurship education (EE), for Technical and Vocational Education and Training (TVET) lecturers to equip them with requisite skills to teach the subject effectively. "PCK includes discourse knowledge, curricular thinking, and anticipatory planning," from the point of view of Hauk, Toney, Jackson, Nair and Tsay (2014: A16). To teach effectively, lecturers are required to be knowledgeable about the subject matter, content, instructional methodologies, and learners (Shing, Saat & Loke, 2015). The lecturers' understanding of the subject matter taught is a reflection of a deep knowledge of CK (Ward, 2016). Despite its importance, lecturers still lack the content knowledge and the Pedagogical Content Knowledge of EE (Motsoeneng & Mahlomaholo, 2015). Lecturers' lack of CK has been noted as an impediment, and this has the potential to block students' progress by imparting false notions (Qian & Lehman, 2017).

A passion for CK alone cannot assist. It needs to be accompanied by a broader and deeper knowledge of PCK to enable effective and smooth teaching (Baki & Arslan, 2017:53). Simply defined, PCK is the ability to teach certain topics and categories of learners (Gess-Newsome, 2015: 36). Lecturers' content expertise is a crucial aspect influencing the teaching and learning process (Ahn & Choi, 2004).

Theoretical framework

In an attempt to realize the objective of the study, Critical Emancipatory Research (CER) was chosen as an appropriate lens. CER advocates for research that enhances the democratic principles of equality and justice, which are liberating, enlightening, emancipating and empowering (Tutak, Bondy & Adams, 2011). Furthermore, CER distinguishes itself as the best in designing the framework for it is geared to empowerment dealing adequately with inequality and promoting learning opportunities for all, irrespective of diversity (Devereaux, 2013; Faulker, 2011; Munger, 2010). CER is used successfully to unpack the PCK in the study, the objective of so doing being to effect the effective teaching of EE (Luke, 2012; Norton & Toohey, 2004). Thus, the study aims to empower TVET college lecturers, and the whole community, and to render the teaching of EE effective.

Conceptual framework: social constructivism

The theory of social constructivism provides a bedrock and is the heartbeat of this study. Social constructivism is applied here as a learning strategy and an educational philosophy that can help TVET College lecturers to teach EE very effectively. The participants in this study are from a community, and this community is influenced by a culture. EE is inherently a social phenomenon and thus social constructivism has relevance, not only for EE, but also for a greater understanding of EE.

Ontology and epistemology

Social constructivism advocates for reality as constructed by the team aimed at constructing a framework for teaching EE (Shrivastava & Kale, 2003:64). The classroom aligned to the social constructivism principle creates a platform for students to actively engage with one another and with their lecturer, thus being able to create their own reality. Knowledge is a result of the products of the actions of human beings, and is therefore socially and culturally constructed (Kim, 2001), which makes it possible to analyse the challenges and components of their strategies, the conditions conducive for implementation of the framework, the threats hindering the framework, and success of the EE for lecturers. Through the process of observation, humans are able to create reality.

The interactions that take place in the classroom enable the students to learn from their peers and the lecturer at the same time, and experience the freedom to interpret the content using their own understanding arrived at through their own findings. Through building on the knowledge they have, they are able to process the new information presented to them. Reality is better understood and discovered through the interaction of human beings..

Individuals create their own subjective meanings of their experiences through interaction with one another and their surrounding environment. Knowledge to a social constructivist is relative and subjective. It is relative because it depends upon the team to justify the knowledge, and one team's knowledge can be different from another team's knowledge. It is subjective because it depends upon what experiences those participants have had. These experiences are shared among the team. Therefore, the team reaches a decision, either consciously or unconsciously, about the viability or usefulness of that knowledge.

Literature review of content knowledge and pedagogical content knowledge of entrepreneurship education lecturers

Lecturers' limited Pedagogical Content Knowledge

A TVET College lecturer has to be aware of the knowledge of students' entrepreneurship conceptions and misconceptions, as well as the knowledge of subject-specific teaching strategies and explanations (Depaepe, Verschaffel & Kelchtermann, 2013:17). Lecturers with insufficient content knowledge struggle to apply different evaluation technique/ cognitive levels when assessing students, which may lead to poor performance (Yilmaz, 2017). Most of the EE lecturers are unable to apply scientific inquiry when teaching, because of a lack of competency and a strong content knowledge of EE and an inability to make the subject practical for lack of exposure to the business world (Sempala & Masingila, 2019). Most lecturers do not have the required skills, or the ability to transform their EE knowledge into practical examples, models and concepts easily conceivable by their learners, which is a skill that they should have, according to Panagiotis and Stasinakis (2015).

The policy documents provided by the Department of Education, namely the Revised National Curriculum Statement (RNCS), and the Curriculum Assessment Policy Statement (CAPS), provide knowledge of the curriculum to improve the quality of PCK in classrooms. Furthermore, the Integrated Quality Management System (IQMS) spells out the professional development of lecturers. However, the effectiveness of these policies is not guaranteed, particularly with lecturers still possessing inadequate SMK, as a result of inadequate teacher training. Thus, the South African government's policy on teacher qualifications known as Minimum Requirements for Teacher Qualifications (MRTEQ) emphasises that a properly trained lecturer must have comprehensive EE knowledge and be able to teach EE, "to determine the sequence and pace of content in accordance with both subject and students' needs, [and, lastly,] have an adequate knowledge of content and students" (DHET, 2011:53).

Responding to PCK for the teaching of EE using a teamwork approach

The origin of Lesson Study (LS) can be tracked back to Japan. LS as a professional development approach is an instrument that proved to be effective in motivating teachers to collaborate in designing a lesson, observing the implementation of other teachers' lesson plans, and making modifications based on what was observed to enhance instruction quality (Suma, Sadia & Pujani, 2019). LS provides an ideal platform for professional development. The teachers are actively involved in both the process as the products, with the focus being on content and specifically on students learning this content. It takes place over a longer time span than "normal" teaching, and there is coherence between the activities (Agricola, van der Schaaf, Prins & van Tartwijk (2020). The teachers work as a group, collaborate in selected topics, and plan and prepare lessons together. Some teach while the others observe students in the classroom. After that they have an opportunity to reflect and discuss their observations. Thus, they are able to enhance their professional development (Agricola, van der Schaaf, Prins & van Tartwijk, 2020). The collective planning and reflection are important to assist the teachers to collectively develop the CK and PCK essential for teaching a certain topic (Tepyllo & Moss, 2011). As a result, collaboration in a group provides them with a platform to reflect on their teaching (Gutierrez, 2016). Teachers who are part of LS group discussions of PCK development have an edge in developing excellent lesson plans than the teachers who do not participate in LS activities (Baki & Arslan, 2015).

Conditions towards continuous professional development

For the EE lecturers to keep informed of the changes in their profession, there is a need to continuously improve their skills and knowledge through continuous professional development (CPD). Professional Development (PD) is viewed as a way to growth because it provides opportunities to face the challenges of their profession. The importance of CPD cannot be taken for granted in a changing environment that requires changes that promote learning in the lecturing role. (Wan & Lam, 2010:2). CPD has reported a positive outcome as result of the lecturer's knowledge improving. Therefore, CPD serves as the best possible condition for improving the lecturer's PCK (Daly, Pachler & Pelletier, 2010:6).

Lecturers' negative attitudes toward PCK workshops

The lecturers are reluctant to continue with workshops because they believe that the workshops are not relevant to the PCK of courses that they teach (Li & Ni, 2011). They believe that the workshops are more theoretical and do not address the practical component of the EE course. Furthermore, the lecturers are unable to implement what they have learnt to the relevant content taught (Egbert, Trena, & Nakamichi, 2002). The lecturers also report that the time allocated to such training is limited. Moreover, the lack of ICT facilities for lecturers makes it very difficult to access the appropriate material for teaching. To access relevant materials for teaching is time consuming, and thus increases lecturers' workload (Bilbatua & Herrero de Haro, 2014).

Indicators of success

The discussion below reviews the literature on the indicators of success for designing a PCK framework for EE teaching.

Conceptual framework for teaching Entrepreneurship Education

The contention is that excellent instruction is grounded in social constructivism. The fundamental philosophical perspectives based on knowledge are influenced by real-life situations. The model of learning built on information reverberates with the exploration of lecturers as leaders, social students, and dynamic framework members. Therefore, with such an understanding, lecturers should fully utilise the potential for interaction during their preparation and facilitation in an effort to encourage students to be active in constructing their own knowledge through their interactions with others.

The student-centred approach to pedagogical practices

Lecturers who adopt the student-centred approach to the teaching of EE have swiftly moved away from the class dominance of a transmissivity education, which is seen as encouraging rote-learning and stifling critical and creative thinking among students. With a student-centred approach, students get involved and take charge of their own destiny (Rowley et al., 2018) and thus encouraging collaborative teaching as a replacement for the boring traditional way of teaching (Wohlfarth et al., 2008). The approach is beneficial to students for it motivates them to think deep, instead of relying on the lecturer's notes (Lopes et al., 2019). The rest falls upon the lecturers to create an environment that encourages the participation of students in creating knowledge rather than just absorbing knowledge presented by a lecturer.

Across several countries, student-centred approaches have proved to be popular among educators. Both the lecturer and student have an opportunity to interchange ideas and to play a critical role in advancing knowledge production. The lecturer's role is that of a facilitator as opposed to a knowledge transmitter (Rowley et al., 2018:36). The approach allows the lecturers'

roles of teaching and making knowledge more tangible by delegating more responsibilities to students and facilitating the- construction of their own knowledge (Kilic, 2010).

Pedagogical Content Knowledge improves the lecturer's ability to teach EE

Kunter, Klusmann, Baumert, Richter, Voss and Hachfeld (2013) reported that PCK has greater predictive power for student progress and instructional quality than CK. Apoor CK impacts teachers' ability to identify common misconceptions underlying student work and to analyze trade-offs between various instructional decisions (Daehler, Heller, & Wong, 2015). The possession of a strong CK is a prerequisite for the presence of PCK (Evens, Elen, & Fien Depaep.2015).

Social constructivist learning has the ability to drive a student-centredness that promotes learning (van der Westhuizen, Nel & Richter, 2012). Thus, its use has yielded positive results in the correct social setting. The effective use of social constructivism has to be "motivating, addictive, and provide encouragement through very short-term goals, so that the player (student) can fail and try again until they succeed" (O'Donnell, Gain & Marais, 2013).

The lecturers are crucial to student learning and have control over what is taught and how it is taught. To be successful, teachers must have strong subject matter knowledge, understand the nature of the subject, be able to translate the subject's concepts into meaningful learning experiences for their students, and highlight applications for the subject within society and in the lives of students (Eshun, Zuure & Brew. 2019). Thus, the knowledge for teaching develops with experience as teachers learn to blend their knowledge of students as learners with their knowledge of content to make concepts understandable (Sothayapetch, Lavonen & Juuti1 2013).

Research Design

This study operationalises a Participatory Action Research (PAR) approach. Teamwork is at the centre of the PAR approach in advancing the agenda of the emancipation of marginalised communities through research (Caxaj, 2015). Furthermore, it is an approach that values the research community as co-researchers and the impact of the research on local communities, viz., TVET College lecturers, Heads of Departments (HoD), business people, and students (Balakrishnan & Claiborne, 2017).

It was agreed that a coordinating team led by two lecturers and myself as the researcher be established. The primary task of the coordinating team was to form a team of individuals interested in participating in formulating a framework to respond to the question of the effective teaching of EE. Embracing a research approach that privileges community voices, TVET College lecturers, and community participation in research, the lived experiences and knowledge of TVET College lecturers are honoured, creating an effect of social transformation (Caxaj, 2015; 2008). After convening, the team set out its priorities. The first challenge was to look at the PCK of TVET College lecturers, the strategies tried locally, the conditions that could hinder the implementation of them framework, and the threats to the strategy. The framework decided on by all participants is now presented next.

Data Analysis

Critical discourse analysis (CDA) was used as a data analysis tool in this study. CDA is primarily concerned with abuses of social power, dominance and inequality wherever enacted and reproduced, and these abuses are resisted through text and talk in the social and political context (van Dijk, 2008:85). Critical discourse analysis operates on the three levels of the textual or linguistic, the discursive and the social or cultural. The analysis was used to unpack

the words both spoken and written, the discursive practice implied and the social or cultural practices to get the deeper meaning in the discourse. Strategies are identified that appeared normal or neutral on the surface, but were in fact ideological and sought to shape the teaching of EE, (Machin & May, 2012:4) to expose the structural inequalities

Findings

Lecturers' limited Pedagogical Content Knowledge of EE

The TVET College lecturers must keep abreast of the current entrepreneurship conceptions and misconceptions, in addition to the knowledge of subject-specific teaching strategies, and explanations are also very important to students (Depaepe, Verschaffel & Kelchterman, 2013). According to Qian and Lehman (2017), many sources of students' difficulties emanate from prior learning and from the inability of most teachers to anticipate the students' misconceptions due to their own limited teaching experience (Depaepe, Torbeyns & Vermeersch et al., 2015). The primary challenge of many teachers, particularly EE teachers, is a weak understanding of EE, which EE is a prerequisite for developing PCK (Suleyman, Lee, Menon & Hanuscin, 2017).

The students enter the class with dissimilar conceptions of life experiences or prior learning. It rests upon the lecturer to identify students' preconceptions and misconceptions in an effort to help students learn entrepreneurship effectively and efficiently. The DHET (2011:4) states that "a wide variety of factors interact to impact on the quality of the education system in South Africa, and that teachers' poor subject matter knowledge and PCK are important contributors". "The Integrated Strategic Planning Framework for Teacher Education and Development in South Africa: 2011-2025, identifies several factors, one of which is teacher preparation, which focuses specifically on subject matter knowledge and pedagogical content knowledge" (DBE & DHET, 2011:4). According to the Constitution of South Africa (SA, 1996b, sect 3; SA) "teaching and learning should meet the pedagogical rights of students". The rights of the students should basically be enjoyed in their respective classrooms.

The following exchange is what transpired in one of the class visits the coordinating team undertook:

Mr. Mofokeng presented the challenges of the entrepreneurship topic in this fashion:

Mr Mofokeng: Today's lesson's focus is on entrepreneurship. I want to ask you a question which many people keep on asking lately. Can entrepreneurship be taught like any course?

Teboho: I do not think so, Sir. Entrepreneurs are born; it is against this that we have very few successful entrepreneurs.

Mr Mofokeng: I agree with you; you need special characteristics to be an entrepreneur, many of which cannot be learnt, and a suitable family background as well..

Selloane: I have learnt in a previous lesson that it is impossible to be an entrepreneur if you do not come from a family of business.

Teboho: If you do not come from a business family, you cannot be an entrepreneur. You learn through practice.

Contrary to what the literature and policy document expects from a lecturer, the above extract, taken from a lesson on-by Mr Mofokeng, clearly illustrates a lack of CK and PCK on EE that can assist the lecturer to clarify misconceptions students have in class. The students' mistakes and misconceptions would be recognized by a lecturer who possess adequate CK and PCK (Nezvalová, 2011). When teaching, the lecturer does not take the students experiences in

to account. The duty of a lecturer is always to take into account the students' prior learning and strive to incorporate it into their teaching (Olfos, Goldrine & Estrella, 2014: 916). The inappropriate response to the students derails them from what they know, which the lecturer fails to illustrate, as to how entrepreneurship can be taught, instead of agreeing with the student's misconceptions. The lecturer suppresses the quest of the students to know by providing them with inadequate answers. The poor SMK is revealed by the lecturer's response.

Furthermore, it should be noted that resistance capital and navigational capital demonstrated by the students, in exploring various possibilities for the answer, leaves them bewildered and crushed down. The lecturer used his powers to conclude that the students' analysis and interpretation were wrong. He ignored the students' multiple intelligences.

Sufficient knowledge of content and students

After a class presentation by the coordinating team, it convened a meeting of participants to discuss the outcome and provide a way forward. After lengthy deliberations this was decided in a meeting.

The same holds true for the relationship between teachers' CK and PCK in the rational number domain (Depaepe, De Corte & Verschaffel, 2015). The teacher who possess sufficient PCK is able to understand students' learning sequence in anticipation of students' responses to different pedagogies and the knowledge of student misconceptions (Chen, Sonnert, Sadler & Sunbury, 2019). The lecturer has to be able to anticipate students' learning misconceptions and mistakes and be ready to give alternative models or explanations to overcome those misconceptions and mistakes (Ilyas, Budayasa & Juniati, 2018:2). It is important for an EE lecturer to understand student thinking in order for them to prepare a responsive lesson enjoyed by students in a class. Lecturers must also interpret student thinking by navigating the language used by students to explain their techniques, so as to reiterate the explanation using correct EE language for the rest of the class. Therefore, the teachers' training programme should unequivocally be geared towards seeking to redress the legacy of apartheid training "especially the poor content and conceptual knowledge found amongst lecturers" (MRTEQ, 2011:9). Discarding a "purely skills-based approach that relies on evidence of demonstrable outcomes as measures of success, without paying attention to how knowledge must underpin these skills for them to impact effectively on learning" is crucial for future growth (DHET, 2011:7).

The following exchange transpired in one of the classes taught by Ms Zwane:

Ms Zwane: One has to be very careful of not mixing an idea with an opportunity as many people treat their ideas as opportunities. The best idea has no value if there is no opportunity or market for it.

Dibuseng: Does the absence of filling stations around the College present an opportunity?

Ms Zwane: Only if it fulfils the core requirements of an opportunity, which are timeliness, attractiveness, durability and being anchored in a product, service, or business that creates or adds value for its buyer and end user.

The lecturer was able to pinpoint the students' difficulties with the topic. The lesson demonstrates her ability to deal with misconceptions and explain correct knowledge for students. The fact that students could not differentiate an idea from opportunity presented a serious misconception. When the students were allowed to interact, they reached the same understanding of an opportunity and an idea. They arrived at the same understanding of the

concepts and A sound subject knowledge, as part of PCK, in teaching the concept ‘opportunity’ as opposed to ‘idea’. It was further reinforced that and opportunity needed to be carefully evaluated to fulfil the prescripts of the concept ‘opportunity.’

With social constructivism, all team members can construct meaning during their interactions with one another (Amineh & Asl, 2015). The lecturer sets the tone for constructive discussion to take place. The classroom for learning and teaching all advocate for engagement (Kundi & Nawaz, 2010:32). Furthermore, the team has to deal with lecturer dominance in class as the only source of knowledge.

Conditions necessary to enhance Pedagogical Content Knowledge among lecturers

The lecturers with deep PCK have the ability to expose students to more opportunities to practice an acquired and appropriate skill, thus enhance student learning (Creasey, Whipp & Jackson, 2012). For effective learning to take place, a lecturer has to possess adequate PCK, the skill which will assist them to address students’ misconceptions (Neumann, Kind & Harms, 2018), employing effective strategies to assist the students not to repeat the same mistakes again (Mishiwo, Sedega, Anane, & Kofi, 2017). The conditions prevailing in a class should allow the students to think outside the box and interact with the lecturer, and fellow students, and, in this way, enabling innovation. The lecturer has to demonstrate an ability that ensures that the thinking of the students is not limited to what they are taught. Therefore, it is important for the lecturer to work collaboratively with other EE lecturers and experts in education.

Mr Mofokeng: Entrepreneurial business has the capacity to create jobs, not small business, as is often reported.

Mpuse: What is entrepreneurial venture, Sir?

Mr Mofokeng: Can small businesses offer more than five jobs and an owner?

Sello: No Sir, they do not have the capacity; they are small in nature and owners have limited capital; another feature is that they are mostly family businesses.

Mr Mofokeng: They are innovative, because they can innovate, they have the potential to grow.

The lesson provided a better explanation to the students between the two concepts. The discussion between the lecturer and students revealed a better understanding between the two. Their discussion was not abstract and as such demonstrated an understanding of the theory which is represented by a rich PCK from the lecturer. The students’ misinformed position is eliminated entirely in this topic. The PCK results in the misconceptions about small businesses being capable of being explained to students. The strategies mean that students will not carry their misconceptions to the next level of their studies. The lecturer was able to expand the students’ thinking through proper probing.

Threats towards Pedagogical Content Knowledge

Lecturers who do not possess a deep CK and PCK are not able to solve students’ learning problems and they are as such a threat to the framework. According to Nurullah .& Nihat, (2016) these lecturers commit similar mistakes and misconceptions as students, thus posing a threat of transferring incorrect and unreliable information onto their students (Wooditch, Rice, Peake & Rubenstein, 2018:2). The lack of PCK threatens the implementation of a PCK framework with lecturers and will negatively affect the delivery of effective teaching, which is teaching that addresses the students’ difficulties and deepens their understanding of subject matter content

(Tseng, 2016). After research in PCK, an EE lecturer “found that despite having a strong background in EE content, many of the lecturers were unable to apply that content knowledge and related skills to their classroom instruction” (Rice & Kitchel, 2016:87).

The class conducted by Mr Mofokeng on small businesses revealed the following:

Mr Mofokeng: The small business is regarded as the engine of economic growth.

Nokufa: It is against this background that South Africa still experiences high levels of unemployment; it is because of a lack of a strong small business presence.

The inadequate understanding from the lecturer above has the potential to threaten the framework. The lecturers who still think of small businesses as a panacea for unemployment is ill informed. The tendency of lecturers to feed students with inadequate information demonstrates a poor PCK. This prevents the lecturer from dealing with the students’ misconceptions and inaccurate information about small businesses.

Evidence that the framework developed to teach EE has yielded good results

In the previous sections the process of developing a framework for the effective teaching of EE was discussed. The PCK challenges of the TVET College lecturer were also discussed, as were the components of the solution, the conducive conditions for an emerging framework to teach EE to work effectively were thoroughly explained. In addition, the threats that have the ability to hinder the implementation of the framework were pointed out, as well as how best to mitigate the risk posed by these threats.

Pedagogical content knowledge

The core components of PCK are as follows: lecturers’ knowledge of students’ learning difficulties regarding small businesses, and lecturers’ knowledge of instructional strategies to teach small business education (Dipaepo et al., 2015:91). The lecturer’s limited PCK was dealt with through a lesson presented by Mr Mofokeng on the topic of small businesses. A deep PCK was demonstrated by the lecturer when he successfully responded to a student’s questions. An understanding of students’ misconceptions and the ability to identify students’ common misconceptions by using effective strategies to help students avoid them, is essential. The PCK of the lecturer developed when he started to collaborate with others.

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