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Competence-Based Education and Training model and its infusion into learning activities at one polytechnic in Zimbabwe

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Abstract

This study sought to gain an understanding concerning how the targeted polytechnic was infusing the Competence-Based Education and Training (CBET) model was into its learning activities. The quantitative approach guided data collection, analysis and interpretation. A semi-structured questionnaire was used to source data from the 18 respondents who were selected through stratified random sampling technique. The collected data was presented using tables and percentages, and analyzed statistically. From the analyzed data it was noted that CBET was conceptualized as a pedagogical model that entailed the designing learning materials, their implementation and assessment. The respondents acknowledged the model's contribution towards the acquisition of competences by the students under the guidance of the lecturers/instructors at the polytechnic and workplace industry and commerce. It was further noted that mostly student-centered approaches were used in learning activities with the aim to enhance hands-on approach to the acquisition of the competences. It can be concluded that through the respondents acknowledged the relevance of CBET model in learning activities and various approaches were used to infuse in activities that were enhancing students' acquisition of knowledge, and skills. Based on the above conclusion, the researchers recommend that lecturers be inducted on how best this model can be infused in their learning activities.

Keywords

Competence-based education and training, experiences, infusion, learning activities, polytechnic.

INTRODUCTION

Discourses on human capital development have increased in recent years due to its effect on society's socioeconomic achievement [1]. Thus, the human capital development lies at the heart of nearly every education and training institution's effort to develop their students' competences [2]. Hence, if polytechnics perform their functions effectively and efficiently, it becomes imperative for them to equip students with relevant competences to enable them to be functional in their society [3]–[5]. In Zimbabwe polytechnic education and training has the following levels: National Certificate, National Diploma, and Higher National Diploma [6]. This structuring of the polytechnic education system underscores the relevance of acquisition of competences in readiness for the real world of work [7]. This exposes students to empowerment through the

acquisition of relevant competences, which are at the core of the Zimbabwean government's transformational agenda [8]. It is in this regard, that the government adopted the CBET model.

In this approach to education and training was now driven by the need to match the requirements of industry and commerce [9]. Thus, industry and commerce specify competence standards and practical assessment guidelines for occupational areas. This differs considerably from traditional model of instruction since it focuses on imparting practical skills rather than theoretical knowledge [10]. In addition, this was a response to a general complaint by employers industry and commerce about the lack of preparedness of polytechnic products for industry and commerce [11]. This created the platform for polytechnics to incorporate employability or generic skills in their programmes and CBET as an appropriate model [12]. This model has the primary objective to enable students to acquire pertinent competences for gainful employment in a given trade or occupational area [13], [14].

The transformation has witnessed the introduction new approaches both to the learning activities and assessment at National Certificate, National Diploma, and Higher National Diploma levels [15]. Thus, the selected polytechnic as per the guidelines of the Ministry of Higher and Tertiary Education Innovation Science and Technology Development's Department of Quality Assurance and Standards was expected to shifted from the traditional lecturer-centered approach to student-centered with the view to equip students with relevant competencies [16]. Though infusion of this pedagogical model in learning activities at this polytechnic has not been well-received by the lecturers [17]–[19], at selected polytechnic. In addition, the literature highlights a lack of innovative pedagogy among lecturers and limited ideas for transitioning to student-centered learning activities [20], [21]. It is against this background that this study sought to contribute towards the closure of this gap guided by the following objective: To establish how CBET model was infused into learning activities at the selected polytechnic.

RESEARCH METHOD

In this section the researchers outlined the roadmap that was employed in data collection, analysis and interpretation.

Research approach

In its quest to gain insights into the issue under investigation, the researchers grounded this study in the quantitative approach. This was appropriate since, it was targeted at developing new insights pertaining the issue at the center of this study that has not been satisfactorily researched [22]. This allowed for an in-depth objective reasoning of the respondents' contributions based on their knowledge levels and experiences [23]–[26], concerning the infusion of CBET model in learning activities [27], at the selected polytechnic.

Sampling

The selected polytechnic has 5 departments with a staff compliment of 180 lecturers. These formed the targeted population for the study. The target population was first organized in groups or strata whose members in each case had common characteristic of belonging the same department. These departments for the sake of this study were assigned names A-E. The distribution of target population was as follows: A (N=20); B (N=30); C (N=40); D (N=30); and E (N=60). Random selection was performed in each of the strata. In this case, 10% of the respondents were selected from each stratum to come up with a sample of 18. These respondents participated in the completion of the instrument used to collected data. This sampling technique was used to gathers data from the proportionally selected respondents [28]. The idea was to get each respondent's opinions on issue raised concerning the infusion of CBET model into learning activities. These were later abstracted and generalized to show generally the respondents' experiences pertaining to the infusion of CBET model into learning activities at the selected polytechnic.

Instrument

A questionnaire with a revised Likert-type scale of Strongly Agree (SA), Agree (A), Disagree (DA) and Strongly Disagree (SDA) was used in study [29]. This questionnaire was made up of questions that were grouped according to the following themes: Part A—demographic characteristics of the respondents, Part B—conceptualisation of CBET model in the context of learning activities context, Part C—CBET model and its relevance to learning activities, and Part D—approaches used to infuse the CBET model into learning activities. The use of this

instrument allowed for a methodical data sourcing and triangulation [30]. Thus, the researchers had the opportunity to check the data sourced from the selected respondents against each other, thereby making a comprehensive analysis.

Data collection

The researchers were granted permission by the Secretary for the Ministry of Higher and Tertiary Education, Innovation, Science and Technology Development to conduct the study at the selected polytechnic. A meeting was conducted with the institution's administration and the targeted respondents with the view to share with them the objectives of the study. Thereafter, respondents' consent was sought in writing for their involvement in the study. The circulation of the questionnaires was done during the learning periods with the approval of the heads of departments. In this case the return rate was high since the respondents were present at the institution to facilitate learning activities. The respondents participated in the completion of the questionnaire voluntarily. The respondents were assured that their contributions were going to be made public or offloaded [31]. In addition, through anonymity the respondents were protected from possible reprisal, given the subtle nature of the topic under investigation [32].

Data analysis

In this study, data analysis was quantitative in nature. The data collected was checked for completeness, and comprehensibility. Thereafter respondents' contributions were quantified in descriptive statistics (i.e. tables and frequencies) to make the analysis and interpretation of the collected data more efficient. In line with ethical practice, the study avoided the use of the respondents' real names so as to protect their identities.

RESULT AND DISCUSSION

In this section the respondents were asked to share their experiences concerning the infusion on CBET model into polytechnic learning activities. In the sub-section below demographic characteristics of the respondents are presented and analyzed.

Characteristics of the respondents

In this section the respondents' demographic characteristics are interrogated through the articulation of their sex, professional qualifications and lecturing experiences.

Table 1. Distribution of Respondents According to Sex, Professional Qualifications and Experience

Attributes	%	Attributes	%
Sex		Lecturing experience (Years)	
Female	33.3	Below 25	16.7
Male	66.7	25 - 29	5.6
Professional qualification(s)		30 - 34	22.2
National Diploma	72.2	35 - 40	22.2
Higher National Diploma	11.1	41 - 45	33.3
BTech/BScEd/BSc	16.7		

In terms of sex, it can be noted that most of the respondents (66.7%) were males and the remainder were females. From the above table it was noted the most of the respondents (72.2%) were holders of National Diploma, 11.1% were Higher National Diploma, and 16.7% were degree holders. Thus, the respondents had the requisite qualifications to enable them facilitate infusion of CBET model into polytechnic learning activities. In addition, it was noted that their length of service as lecturers can have a positive influence on how they infuse the CBET model into polytechnic learning activities. In the next section the respondents' conceptualisation of CBET pedagogical model is looked at.

Conceptualisation of CBET model in the context of learning activities

It is in this context, that the results as presented under the theme of the conceptualisation of CBET pedagogical model in the context of learning activities. In the Table 2, contributions advanced by the respondents are presented.

Table 2. Conceptualisation of CBET

Attribute(s)	SA	A	DA	SDA
a. Is a holistic structure, which makes it a rich methodology for CBET	11.1	61.1	22.2	5.6
b. It focuses on outcomes which are key to students' employability	66.6	22.2	5.6	5.6
c. Is a careful selection of competences to be developed in an individual	33.3	44.4	16.7	5.6
d. Allows for flexible training approaches such as large or small groups, individual study and project work	16.7	72.2	11.1	0
e. It is student-centered	66.6	16.7	11.1	5.6

Note: Units in percentage (%), SA=Strongly Agree, A=Agree, DA= Disagree, SDA= Strongly Disagree.

From Table 2, it can be noted that most of the respondents (61.6%) acknowledged CBET model as a holistic structure, which makes it a rich methodology for the acquisition of competences in polytechnics. In the same vein, 66.6% of the respondents were strongly in agreement with the notion that CBET model focuses on the outcomes which are key to students' employability. Thus, the respondents conceptualize CBET as a model grounded in transformative-based learning approaches centered on equipping students with knowledge and skills relevant for the real world of work. This was also augmented by some respondents (44.4%) who considered the CBET model as a careful selection of competences to be developed in an individual through the integration of theory into practice. Further to this most of the respondents (72.2%) were in agreement with the view that CBET was model, which allows for a flexible learning approach involving large or small groups through individual study and project work, and these are done at the students' own pace. This concurs with the contributions by 66.6% of the respondents who highlighted that this model of education and training was student-centered. Therefore, in this study, the CBET model refers to activities supervised by lecturers/instructors at the selected polytechnic, enabling students to gain competencies for industry-standard task performance.

CBET model and its relevance to learning activities

In this section contributions concerning the relevance of CBET pedagogical model in learning activities are presented and interrogated.

Table 3. Relevance of CBET Model to Learning Activities

Attribute(s)	SA	A	DA	SDA
a. It enhances the quality of training	66.6	27.8	0	5.6
b. Students link theory to practice while they learn	5.6	61.1	22.2	11.1
c. Students gain in confidence in work situations	16.7	44.4	27.8	11.1
d. Training time is used effectively and efficiently	22.2	50	16.7	11.1
e. Mentors or instructors spend more time with trainees or students	33.3	44.4	16.7	5.6

Note: Units in percentage (%), SA=Strongly Agree, A=Agree, DA= Disagree, SDA= Strongly Disagree.

From Table 3, it can be noted that most respondents (66.6%) strongly agreed to the view that quality of training and relevance of knowledge and skills are enhanced through CBET. With 61.1% of the respondents agreeing to the view that CBET assists students to gain competencies through applying knowledge and skills while they participate in learning activities. Thus, 44.4% of the selected respondents indicated that students gain in confidence in work situations. In addition, some respondents (50%) were in agreement with the notion that CBET was relevant in learning activities, since the training time was used effectively and efficiently. In the same sense, some of the respondents (33.3%) strongly agreed to the notion that CBET was relevant to learning activities at the selected polytechnic since more mentors' and supervisors' time can spent with trainees. Therefore, the main goal of this approach in learning is to provide students with experiences that help them enjoy the assigned tasks and activities through their personal engagement.

Approaches used to infuse the CBET model into learning activities

At the center of section is on the discussion of approaches used to infuse CBET model into learning activities at the selected polytechnic.

From Table 4, most the respondents (72.2%) were strongly in agreement with the view that problem-solving (action research) was one of the approaches that were being used in learning activities at the selected polytechnic. From another angle, some respondents (66.6%) were in agreement with the opinion that project-based learning was one of the approaches in used to engage students in learning activities at the selected polytechnic. Some of the respondents (50%) were strongly in agreement with the view that design-based learning was one of the approaches that were used to infuse CBET pedagogical model into learning activities. With 44.4% of the respondents in support of the notion that group work (peer tutoring) can be an effective approach in integrating CBET in learning activities. However, it was significant to acknowledge in learning activities at the selected polytechnic existed students with diverse learning needs. In the same context, 44.4% of the respondents were strongly in agreement with the view that differentiated learning was one of the approaches that was taken into account when integrating CBET pedagogical model in learning activities at the selected polytechnic.

Table 4. Approaches Used when Infusing CBET Model into Learning Activities

Attribute(s)	SA	A	DA	SDA
a. Problem-solving (action research)	72.2	16.7	11.1	0
b. Project-based learning	22.2	66.6	5.6	5.6
c. Design-based learning	50	22.2	16.7	11.1
d. Group work (peer tutoring)	27.8	44.4	16.7	11.1
e. Discussion (interaction and sharing)	61.1	22.2	11.1	5.6
f. Differentiated learning	44.4	33.3	16.7	5.6

Note: Units in percentage (%), SA=Strongly Agree, A=Agree, DA= Disagree, SDA= Strongly Disagree.

These approaches emphasize that collaborative learning activities facilitate students' ability to construct their own knowledge in their quest to acquire relevant skills. Hence, the need for a learning environment that allows for students to take responsibility for their learning, which aligns with the requirements of the CBET as a model. Therefore, this model puts students at the center of learning activities and develops independent critical thinking skills in them to enable them to be functional in their working areas.

Discussion of findings

The above results acknowledged that CBET model was anchored on student-centeredness and the learning activities were geared towards the acquisition of competences. Thus, CBET model is an innovation aimed at improving the transition from polytechnic environment to workplace industry and commerce after graduation [33]. This is seen as an effective path way towards enhancing the quality of instruction in polytechnic learning activities.

In this context, this model helps students improve their theoretical and practical knowledge through it focus on putting into practice their tasks. This model provides students with knowledge and skills using a mixture of theoretical and practical approaches to learning activities. Therefore, CBET model guarantees that learning activities are pertinent to the requirements of industry, commerce and students. In addition, students' strong point and weaknesses are noted and strategies to improve on the identified weak areas are put in place.

This model calls on lecturers to design learning activities that enable students to acquire the relevant knowledge and skills. Therefore, increases students' competences in the face of new challenges in societies, industry and commerce. Hence, this model gives emphasizes that learning is a continuous process and students must uninterruptedly progress and bring up-to-date their competences through the focus on skills transfer rather simply transferring knowledge. This implies that students acquire competences at their own pace, as the learning outcomes are clearly laid out and open to both the students and the instructors. In this case the CBET model helps in the assessment of an assortment of skills and attitudes efficiently over a period of time. So, with this model lecturers can take stock of students' rate of progression in given competence area. This creates a robust and worthwhile environment for an impartial and precise student assessment.

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In other words, the CBET model transforms the requirements of industry and commerce into learning activities. In support, Mulenga and Kabombwe [34] postulated that this model contains specific outcome of statements that show the competencies to be attained, expected behaviours or tasks, conditions for their performance, and acceptable standards shared with students. Hence, the CBET model focuses on creation of a learning environment that drives students to be active knowledge seekers and experiential. This means through the learning activities, students are capable of adopting a mindset that gives emphasis to innovation, and ethics.

CONCLUSION

From the analyzed and interpreted data, it was revealed that the respondents conceptualized CBET model as holistic structure, focuses on outcomes which are key to student's employability and this can made possible through the careful selection of competences to be acquired by the students through flexible learning approaches. It involves the use of various student-centered approaches to expose students to knowledge and skills, which prepare them according to the expectations of the industry. Based on this it can be concluded that the infusion of CBET model into learning activities creates a conducive environment that facilitates the link between theory and practice at the selected polytechnic. From the conclusion it can be recommended that lecturers/instructors as the curriculum implementers need to be adequately inducted such that they can adequately infuse CBET model into their learning activities.

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