Creating pathways to enhance college to work transition using COMET competence diagnostic model to assess and develop occupational competence and commitment in Technical Vocational Education and Training (TVET).

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Summary: This paper sets out to examine the levels of occupational competence and the impact thereof on TVET student readiness for transition to the world of work in the conceptual age.Holistic problem solving underpinned by creative thinking,shaped in an apprenticeship/dual TVET delivery, is a key element in this study. Central to the debate around high youth unemployment is the issue of student occupational competence levels to access the opportunities created by government policies andstrategies. Thischallenge is addressed by analysing the impact of a reflective, conceptual thinking, work-based learning approach.Concepts such as novice to expert paradigm, conceptual thinking and functional to holistic competence serve ascatalysts to improve articulation of students to the workplace. COMET psychometric measurement applied in this study providessolidempirical evidence regardinga lack of holistic problem solving skills needed for college-to-work transition.

Keywords: Apprenticeship, college to work transition, youth employment, occupational competenceand commitment

Introduction

TVET is seen as an important public policy tool to support economic growth and poverty alleviation. It is instrumental in the transition from school to decent work and adulthood; increasing productivity of existing workers and steering the unemployed into work; assisting in reconstruction after conflict and disasters and promote social inclusion (UNESCO, 2013). Thesignificance for a well-defined occupational competence assessment tool to quality assure TVET is accentuated in this statement of the Southern African Development Community (SADC) region and the United Nations Educational, Scientific and Cultural Organisation (UNESCO).

To effectively enter the world of workstudents must be equipped with conceptual thinking to break through establishedspecialised patterns towards thefinding of meaning in an integrative work environment. Daniel Pinkrefers to the importance of synthesis, finding innovative, enduring solutions and inductive reasoning(Pink, 2006).TheCOMET three-dimensional model has the possibility to assess and develop these critical elements needed for students to enter the workplace.COMET is a psychometric model used for the assessment and development of occupational competence in TVET(Rauner, et al., 2013).

According to Stuart, author of the South African National Skills Handbook, graduates in engineering and science, predominantly from TVET colleges are provided with the knowledge and some practical training, but then left without work

experience and ultimately unemployed (Prinsloo, 2011). The interrelatedness of theory and workplace apprenticeship is vital for the development of occupational competence towards improved employment prospects.

The transfer of training to the workplace is complicated and complex. The adaptation to a changing environment is influenced by the nature of the transfer (Subedi, 2011). Logical, critical and analytic thinking is inevitable.

The average age for South Africans was 25 years in the 2011 national census, with just over one third being under the age of 15(Jordaan, Ngcobo, Motloutse, & Tala, 2012). The Quarter 4, 2014 Labour Force Survey pitched unemployment for youth between the ages 15 to 35 at 36, 1% (Statistics South Africa, 2015). TVET need to transform into centres of excellence, responsive to socio-economic needs to strengthen economic and human capacity.

Methods andresearch design

Participants comprised of 813 students and artisans from 6 TVET Colleges (8 – campuses) and 5private Training Academies in Engineering. (Male-62, 4%; Female - 28,4%; No response – 9,1%). 49,4% of students ranged between ages 20-25.

Research questions posed in this study seek for the relationship between variables as measured entities, being occupational competence levels as the dependent variable and student holistic problem solving skills as the independent variable:

Would the implementation of the COMET competence diagnostics model in TVET effect higher quality assessment for the development of occupational competence and commitment?

The following measuring tools were applied:

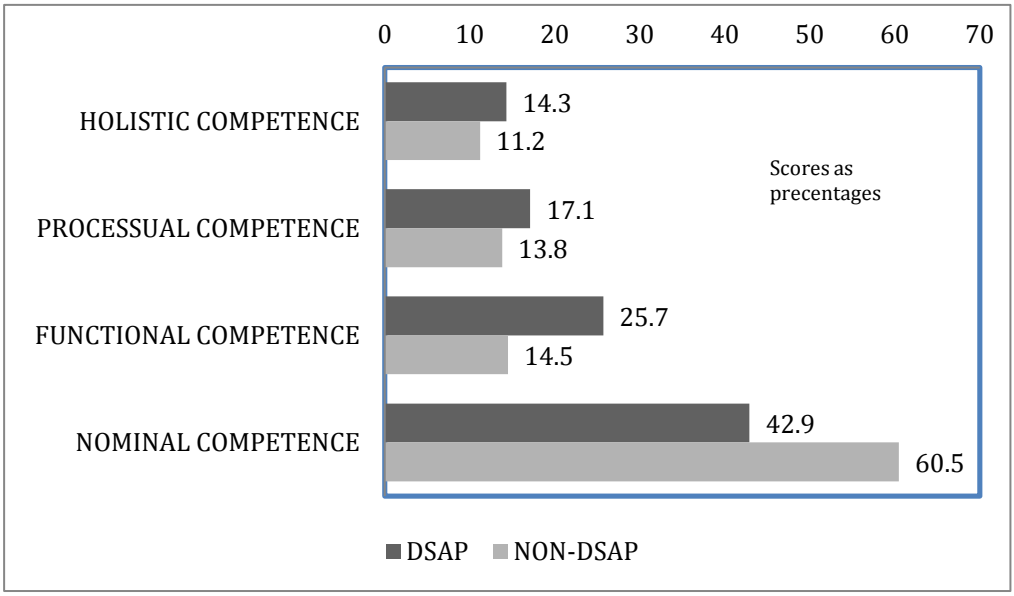
- *COMET competence diagnostic assessment and development measuring tool.*
- *A questionnaire comprising of 30 items measuring the impact of Assessment Feedback on occupational competence development.*
- *COMET Occupational Commitment and Motivational questionnaire.*
- *Qualitative focus group interviews with TVET students.*

Study programmes selected are Mechatronics, Millwright, Welding and Electrical. Test Task validity was established. COMET Large-Scale Open Test Task assessment was conducted. It measures the occupational competenceto solve complex problems based on the respective curriculum, holistically. Occupational competence levels were rated and analysed. The management of institutions involved in the study was informed regarding the nature of the study during site visits prior to the actual study. Raters were identified and trained.

Results

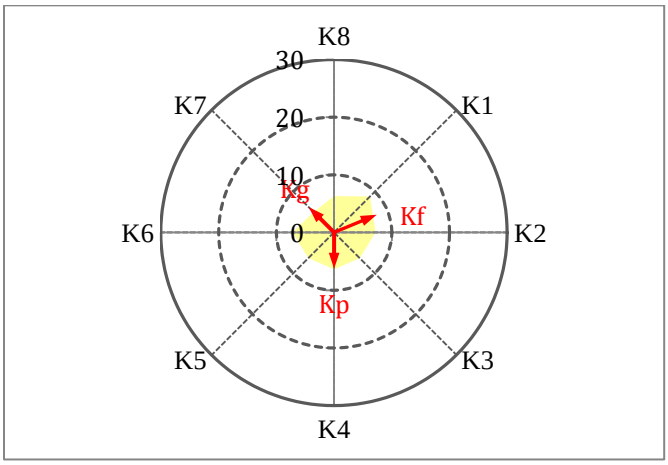
Occupational competence levels measured indicated that qualifications do not guarantee the development of occupational competence amongst students. The typical applied curriculum appears not to be sufficient in preparing TVET students for the transition from College to Work. 31% of the 813 students obtained a total score below 5 and were therefore excluded from the final analysis. Students in the dual system apprenticeship programme(DSAP)exposed a real work situation acquired higher occupation competence levels in comparison to sole College based peers (NON-DSAP) as illustrated in Table 1.

Table 1 – Occupational Competence Levels– DSAP versus NON-DSAP



There is no significant difference in holistic competence levels over years of training - Year 1- 3.6; Year 2- 2.7; Year 3-2.0; Year 4- 3.3. A modularised, applied curriculum appears to lead to stagnation of competence development and in the process hampers the creating of pathways from college to work.54, 6% of students found the test tasks rather difficult but useful (Very Much-63, 3%; Much-18.4%) and over 92, 2% of test takers expressed the desire for this type of test tasks to become part of their training. 71.7% of Students indicated that they put very much effort in doing the test tasks. 63,4% indicated that they feel very much closely related to their occupation. Students were committed to doing the tasks – 73,5% indicated that they concentrated at a very much level and 71,1% placed very much effort into it.

Figure1: Student performance on COMET criteria for holistic problem solving



K1-Clarity/Presentation
K2-Functionality
K3-Use value
K4-Cost Effectiveness
K5-Business /Work Process
K6-Social Responsibility
K7-Environmental Responsibility
K8-Creativity
Kf-Functional Competence
Kp-Processual Competence
Kg-Holistic Shaping Competence

Student responses during the focus group semi-structured interviews provided valuable substantive information for the qualitative statistical data on holistic problem solving and occupational competence levels. The main themes are as follow:

- *Challenges experienced during COMET large –scale assessment are due to the fact that students are used to assessment types where they merely reproduce and apply what they have learnt as opposed to COMET assessment requiring holistic problem solving strategies and thinking.*
- *TVET courses without workplace based learning are not equipping students adequately for the workplace.*
- *Feedback after assessment should be more than scores to improve student performance.*
- *A dual system is essential for the development of work readiness, but it must be well planned and organised with a clear memorandum of understanding inclusive of all stakeholders.*
- *TVET occupations have the potential to improve student's quality of life because of the possibility for self-employment as well the need for Artisans in South Africa and Internationally.*
- *With COMET assessment you need to understand how to solve problems in the real world.*
- *Qualities needed by students to survive the workplace are Teamwork, Adaptability, Dedication and Commitment, being Observant, Listening skills, Discipline, Workplace experience, Thinking out of the box, Creativity, Integrity, be able to see Opportunities, good Interpersonal and Personal relations and Happiness.*

Empirical quantitative as well as qualitative findings from the study support the research question. Firstly, insight in the TVET student holistic problem-solving paradigm is gained and reflected in the occupational competence levels. Secondly, educators are equipped with qualitative data to study the impact of TVET delivery on work prospective. Finally,it directs policy makers regarding the position of TVET in relation to sector expectations.

This disparity between poor levels of occupational competence and high levels of vocational identity and commitment as well as motivation indicates a disjuncture between student perception and curriculum outcomes. Students lack thinking and problem solving skills to survive the work place demands of the Conceptual Age, which will probably complicate the transition from college to work.Their concept of qualities needed for the workplace is vague and indicative of a lack of understanding of the dynamics and demands thereof. TVET should focus on workplace trends such as Flexibility, Virtual work spaces, Improved quality of life for individual and company prosperity, Mindfulness, Whole Brain thinking, Sense-making, Socialintelligence, Transdisciplinarityand the ability to think globally but act locally(Sodexo, 2015).

The 21st century workplace requires workers that can deliver beyond mere functionality. Pink refers to the demands of the Conceptual Age workplace in terms of six high-concepts impacting the mind: 1. Not just function but Design – referring to creativity and being emotionally engaged; 2. Not just argument but Story – persuasion, self-understanding, communication; 3. Not just focus /specialisation but Symphony – seeing the big picture, holistic solutions; 4. Not just logic but Empathy – social wellness, relationships; 5. Not just seriousness but Play – humor and fun to

improve overall wellness; 6. Not just accumulation but Meaning – significance, transcendence, spiritual fulfillment (Pink, 2005). The COMET model as illustrated in Figure 2, is based on holistic problem solving rooted in eight criteria and work process knowledge which exceedsthe know THAT (knowledge) to know HOW and know WHY, is well positioned to address the transition from the Information Age dominated by the accumulation of knowledge, information and technology to the Conceptual Age workplace.

Figure 2: Criteria for the complete (holistic) solution of professional tasks – Work process knowledge.

The COMET assessment and development tool provide the data and methodologies needed in creating pathways to enhance the student's transition from College to the 21st century Workplace.

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