

The Influence of Mental, Physical, Ethical and Entrepreneurial Skills on Innovative Abilities of Technical and Vocational Education and Training Graduates

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Abstract

The main objective of TVET is to produce competent, employable and self-reliant graduates but majority of TVET graduates lack practical hand-on skills needed by the industry rendering them unemployable. This research investigated the influence of mental, physical, ethical and entrepreneurial skills on innovative abilities of TVET graduates. The aim of this study was to assess whether mental, physical, ethical and entrepreneurial abilities promote TVET graduates innovativeness. This study was conducted through a survey research design. Purposive and stratified sampling techniques were used to select the sample for the study. The data was analyzed by use of the Statistical Package for Social Sciences (SPSS) computer program. This study adopted the Gestalt theory which states that stimuli only have meaning as they are cognitively organized by a person. Learning is based on changes in perceptual process; thus true learning, or insight, occurs when the individual perceives new relationships with the field and if a person does not understand how to use a certain tool, insight will not occur until he or she figures out the relationship between the tool and its function. The study's conceptual framework illustrates the relationship between mental, physical, ethical, entrepreneurial skills and innovativeness of TVET graduates. In this study mental, physical, ethical, entrepreneurial abilities are the independent variables while TVET graduate innovativeness is the dependent variable. The employees who were innovative in the industry indicated that the TVET education they went through integrated mental, physical, ethical, entrepreneurial skills training. TVET education should integrate mental, physical, ethical, entrepreneurial skills training to produce innovative TVET graduates. TVET graduate who will be equipped with mental, physical, ethical, entrepreneurial skills will be innovative and self-reliant for sustainable development.

Key words: Mental Skills, Physical Skills, Entrepreneurship Skills, Innovative Abilities.

INTRODUCTION

All over the world and particularly Sub-Saharan African countries, governments are revitalizing efforts to support Technical and Vocational Education and Training (TVET) with the faith that skill development will boost productivity and foster economic growth and development (Dasmani, 2011). Kenya is expected to develop towards a middle income economy and be an industrialized nation by the year 2030. One of the objectives of Kenya Vision 2030 is to improve the quality of education which will prepare the foundation for technology-oriented and information-based global economy (Chauvel, 2017). Kenya is a predominantly youthful society which represents a fabulous potential development of human

capital which the society cannot neglect. Many youth face high unemployment and difficulties in getting a firm footing into the labor market (Maigida *et al.*, 2013). Many youth have graduated from TVET institutions but they are not able to secure jobs in the market because they lack the required hands-on practical skills (Asghar & Iqbal, 2015). In support of Asghar and Iqbal, Maigida *et al.* (2013) complains that graduates from Kenya TVET institution have been found not to be having the skills required by employers. In response to this problem, he recommends a Technical and Vocational Education and Training (TVET) program that integrate entrepreneurial skills to enable its graduates wrestle unemployment which has reached worrying proportions.

Chege (2009) reveals that most of the TVET instructors are not well equipped with practical hands-on training skills to enable them to effectively transfer practical skills to the TVET trainees. A curriculum that is balanced in terms of design and with emphasis on the enhancement of mental, physical and ethical abilities will result in the development of a holistic, knowledgeable and competent human capital (Malaysia Polytechnic, 2015). Leke (2010) recommends that TVET programs at the business / industry level need to have a value orientation that emphasizes on the knowledge, skills and attitudes for social sustainability that can develop all the power and faculties of the individual namely mental, physical, and behavioral. Once TVET graduates are equipped with entrepreneurial skills, they will become entrepreneurs and create job opportunities (Asghar & Iqbal, 2015).

Mental skills referred to as cognitive skills in bloom's taxonomy include; knowledge of recall and application, use of intellectual skills, comprehending of information, acquiring and developing concepts, creative thinking, organizing ideas, securing rules, generating and testing hypothesis and analyzing and synthesizing of data (Ochsner, 2013). According to Leke (2010) physical skills referred to as psychomotor skills in bloom's taxonomy is the ability to use the mind and body senses to coordinate body muscles and parts to skillfully and competently carry out various synchronized activities, that is, practical hands-on skills. Ethical skills referred to as affective skills in bloom's taxonomy comprise of humility, commitment, honesty, teamwork and consistent behavior (Raihan, Hassan & Shamim, 2013). Entrepreneurial skills include abilities to create, innovate, start new business, take risks, plan projects and manage projects (Maigida *et al.*, 2013). Adams (2006) accounts that creativity (innovativeness) arises through the confluence of knowledge, creative thinking and motivation. He explains that knowledge refers to the appropriate comprehension of an individual has to be creative, creative thinking refers to an individual's thinking and working style in tackling problems, and motivation is the momentum to creative production.

This study reviewed literature related to the influence of mental, physical, ethical, and entrepreneurial skills on innovativeness of TVET graduates. Cognitive teaching and learning models help learners to process information, develop concepts, acquire concepts, acquire rules, generate hypothesis, test hypotheses, think creatively, comprehend information, organize ideas, analysis data, synthesize data, apply knowledge, choose alternatives in problem solving, evaluate ideas or actions, recall knowledge and use of intellectual skills (Jones and Bartlett, 2005; Faraday *et al.*, 2011). Mental abilities are nurtured by equipping the mind of a trainee with knowledge and information required to solving a problem. Physical

(psychomotor) means “...of or relating to movement or muscular action related with mental processes (Tan, 2006)”. Jones and Bartlett (2005) asserts that the term psychomotor refers to the use of the brain and senses (psycho) to tell the body what to do and the use of the muscles (motor) to tell the body how to move to accomplish a task or perform a skill. Psychomotor or practical hands on skills involve; practical skills, job centered skills and information technology skills (Leke, 2010). According to Mishra, Barans & Pislaru (1967) psychomotor skills provide a competence to learners to carry out tasks with great proficiency. Physical skills equips the learners with the skills to use the mind and body senses to coordinate body muscles and parts to skillfully and competently carry out various synchronized activities. Physical skills are practical hands-on skills required by the youth to fit in the current job market. Ethical (affective) learning outcomes involve attitudes, motivation, and values (Raihan et al., 2013). Punctuality, team work, self-confidence, moral integrity, humility, honesty and commitment are affective skills considered vital for a person to acquire in order to be productive in a working environment (Leke, 2010). The development of students’ affective domain allows them to constantly adopt a paradigm and a philosophy that will guide them to behave consistently with their personal values (Malaysia Polytechnic, 2015). The affective element establishes links between the practical task and students’ state of mind by putting activity into a meaningful context (Pavlova & Huang, 2012). Jones and Bartlett (2005) say that affective learning concentrates on the characteristics that make each person unique in his or her individual’s inclinations, insights and values. Ethical skills fosters punctuality, team-work, moral integrity, self-discipline, interest, commitment, self-confidence, honesty, humility and consistent behavior in a trainee. Entrepreneurship refers to an individual’s ability to turn ideas into action and it comprises of creativity, innovation, risk taking and the ability to plan and manage projects in order to achieve desired objectives (ECEI, 2009). Maigida *et al.* (2013) informs us that entrepreneurial studies are inter- disciplinary training that focuses on the tools required to start a new business or vocation. Unemployment is major problem youth face in developing countries. Self-employment in small business is key to eradicating the problem of unemployment among the youth (Asghar & Iqbal, 2015). In this condition entrepreneurship education plays a substantial role in fostering entrepreneurship abilities in the youth. This will enhance small business that will offer more job opportunities for the unemployed youth. ECEI (2009) informs that entrepreneurial programs and units provide students with knowledge to think creatively and solve problems effectively. It adds on that entrepreneurship education is a major ingredient in vocational training because it equips students with innovative skills required in working life and self-employment. Therefore, entrepreneurship is an individual’s capacity to create, innovate, take risk, plan and manage projects. Innovation is the creation and accomplishment of new ideas (commodities, services and models) to meet needs (Ali & Caulier-Grice, 2018). UNESCO (2010) contends that innovation is the heart beat of economic growth. It states that research and advancement in engineering is the main force behind innovation. It also reveals that engineering and innovation enhances efficient resource use and wealth formation by a factor of five (5) or an eighty (80) per cent enhancement in resource use. Ali and Caulier-Grice (2018) remind us that innovation is desired to remodel the services around the prerequisites of learners and employers and to respond to the challenges. A quality education is the groundwork on which all adaptive innovation related skills are pivoted (Toner, 2011). Lettmayr and Nehls (2011) reported that a

higher share of workers with a TVET background may be favorable for knowledge transfer, investments in skills and aid innovations. Innovation is the creation and accomplishment of new ideas and new things so as to meet people's needs.

The skills acquired by trainees in TVET institutions often do not meet the prospects of employers. PLANCO (2017) and Maigida, Saba & Namkere (2013) lament that most youth in Kenya are locked out of employment because they lack needed skills and do not have the ability to adapt their skills to the constantly shifting demands of the job market. They reveal that many TVET institutions only equip students with purely theoretical knowledge at the expense of practical hands-on skills. Most TVET stakeholders fail to internalize the fact that the demands of the job market are changing with time predominantly in the technical field. The instructors of TVET trainees have been found to lack practical hands-on skills rendering them ineffective to transfer practical hands-on skills to TVET trainees. A study conducted by Chege (2009) which assessed instructors drawn from many TVET institutions in Kenya revealed that the training most TVET instructors went through did not equip them with sound practical hand-on skills. Global contest places substantial demands on innovation and entrepreneurship, while global certification demands new viewpoints on engineering education, requiring timely and appropriate responses from engineering education system (UNESCO, 2010). Many studies have been done on TVET but no comprehensive study has been carried out on the influence of mental, physical, ethical and entrepreneurial skills on innovative abilities of TVET graduates. This situation prompted the research to assess the influence of mental, physical, ethical and entrepreneurial skills on innovative abilities of TVET graduates. The results of this study will be used by education and curriculum designers to design an educational curriculum which will foster innovativeness in TVET graduates. It will also create awareness that mental, physical, ethical and entrepreneurial skills training develop TVET graduates innovative abilities.

RESEARCH QUESTIONS

This study was guided by the following research questions:

1. Were mental, physical, ethical and entrepreneurial skills integrated in TVET education program the TVET graduates went through?
2. What is the influence of mental, physical, ethical and entrepreneurial skills on innovative abilities of TVET graduates?
3. Is there any significant relationship between mental, physical, ethical and entrepreneurial skills?
4. Were innovative workers in Mashariki motors and Car & General Motors companies equipped with mental, physical, ethical and entrepreneurial skills?

CONCEPTUAL FRAMEWORK

This conceptual framework specifies the area of research interest. Figure 1 shows the study conceptual paradigm. In these study mental skills, physical skills, ethical skills, entrepreneurial skills are the independent variables while innovative abilities of TVET graduates are the dependent variable. The figure also illustrates the relationship between mental abilities, physical abilities, ethical abilities, entrepreneurial abilities and innovation abilities of TVET graduates. It also shows

that harmonious development of TVET trainees' mental, physical, ethical and entrepreneurial skills nurture innovative abilities of TVET graduates.

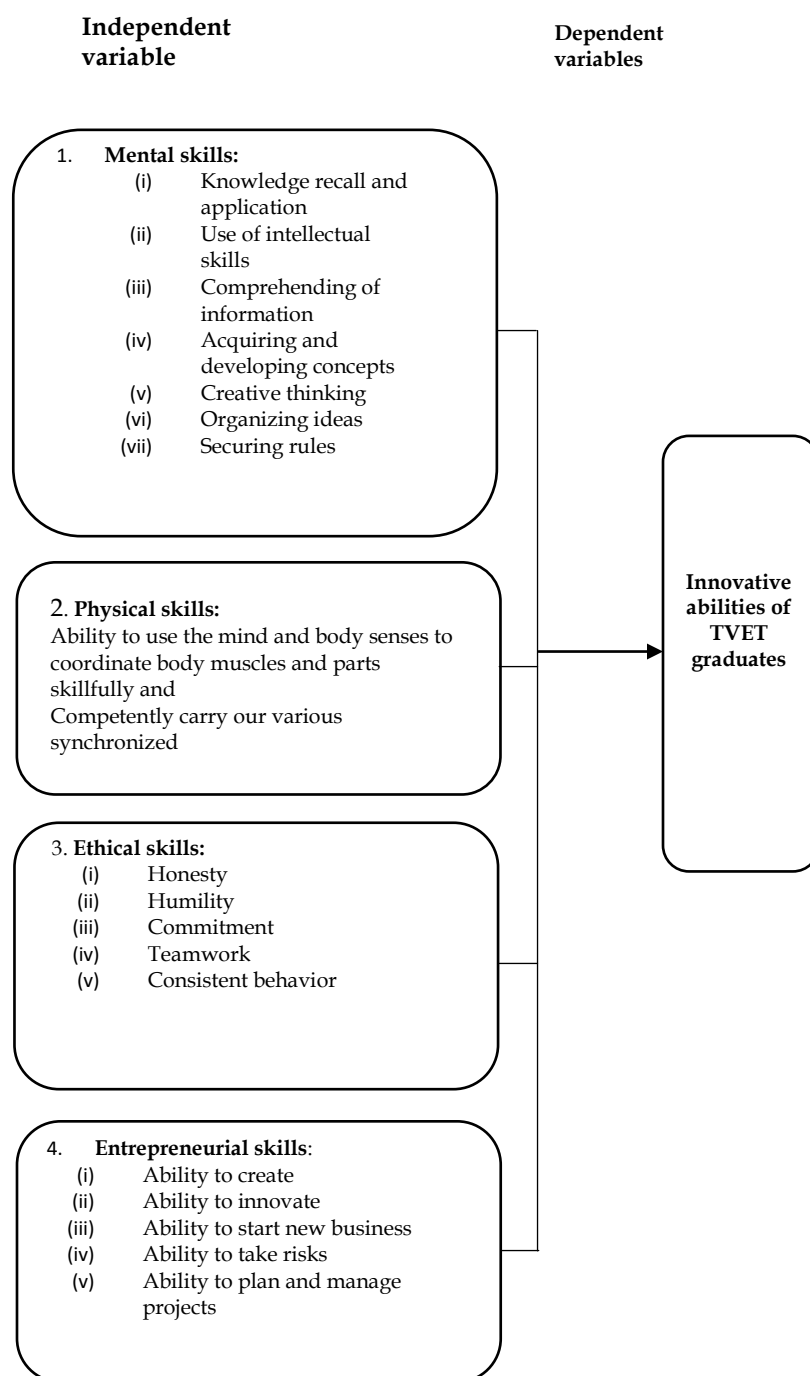


Figure 1: Conceptual framework (Author, 2018)

THEORETICAL FRAMEWORK

This study adopted the Gestalt theory which states that stimuli only have meaning as they are cognitively organized by a person. Learning is based on changes in perceptual process; thus true learning, or insight, occurs when the individual perceives new relationships with the field and if a person does not understand how to use a certain tool, insight will not occur until he or she figures out the relationship between the tool and its function (Lewinski, 2015). Therefore, the learning of mental, physical, ethical and entrepreneurial skills will equip TVET graduates with knowledge they need to be innovative workers who are self-reliant and employable.

METHODOLOGY

This study was conducted through a survey research design since the researcher was concerned with providing qualitative and numeric descriptions of a target population. The population for the study comprised of thirty (30) supervisors and one hundred and eighty (180) TVET graduate working with Mashariki and Car & General Motors companies. All thirty (30) supervisors and one hundred and fifty (150) out of one hundred and eighty (180) TVET graduates were selected for the study. Simple random and purposive sampling techniques were used to select the sample for the study. Two sets of questionnaire and an interview schedule were used to collect data for the study. One questionnaire was for the supervisors and the other was for the TVET graduate workers. The questionnaires were both open and closed ended and used a four (4)-point Likert scale. One interview schedule was for the supervisors and the other was for TVET Graduate workers. The questionnaires were administered to ten (10) supervisors and thirty (30) TVET graduate workers in Toyota Kenya Company Limited during pretesting. The questionnaires were analyzed which gave satisfactory internal consistency reliability coefficient value of 0.8001. The Researcher obtained a research permit from the National Council for Science and Technology and Innovation (NACOST). The researcher also sought permission from the Ministry of Education Science and Technology and the Nairobi County Government to allow him to collect data in the selected companies. Finally, the researcher administered questionnaires to both graduate workers and departmental supervisors. The researcher also interviewed the selected supervisors and TVET graduate workers in the two selected companies. Descriptive and inferential statistics were used to analyze data. The data was analyzed using the Statistical Package for Social Sciences (SPSS).

RESULTS AND DISCUSSION

RESEARCH QUESTION 1:

Were mental, physical, ethical and entrepreneurial skills integrated in TVET education program the TVET graduates went through?

TABLE 1: Responses to whether mental, physical, ethical and entrepreneurial skills were integrated in teaching and learning of TVET program the TVET graduates went through.

S / No.	Item statement	4 SA	3 A	2 D	1 SD	Mean	Decision
1.	Mental skills	100	40	6	4	3.88	Agree
2.	Physical skills	10	30	53	57	1.85	Disagree
3.	Ethical skills	8	12	70	60	1.89	Disagree
4.	Entrepreneurial skills	6	9	78	57	1.62	Disagree

Source: Field data. $X \geq 2.49$ Agree Key. SA = Strongly Agree, A = Agree, D = Disagree, SD = Strongly Disagree

Table 1 reveals that most (93 %) of the TVET graduates were trained mental skills, a few (20 %) were trained Physical skills, very few (13 %) were trained ethical skills, and a very small proportion (10 %) were trained entrepreneurial skills. Raihan et al. (2013) supports this finding by revealing that most of TVET institutions concentrate on training mental skills at the expense of physical, ethical and entrepreneurial skills. This indicates that Most of the TVET graduates were mainly trained in mental skills but less trained in physical, ethical and entrepreneurial skills.

RESEARCH QUESTION 2:

What is the influence of mental, physical, ethical and entrepreneurial skills on innovative abilities of TVET graduates?

TABLE 2: Correlations statistics between mental, physical, ethical, entrepreneurial skills and innovativeness in TVET graduates

	Mental skills	Physical skills	Ethical skills	Entrepreneurial skills	Innovativeness
Mental skills	1				
Physical skills	0.3980	1			
Ethical skills	0.4357	0.1253	1		
Entrepreneurial skills	0.6977	0.5688	0.6543	1	
Innovativeness	0.7987*	0.8788*	0.6751*	0.7789**	1

**p > 0.01

The above correlational matrix shows that there is statistical significant and resilient positive correlation between mental skills ($r = 0.7987$, $p > 0.01$) and innovativeness, physical skills ($r = 0.8788$, $p > 0.01$) and innovativeness, ethical skills ($r = 0.6751$, $p > 0.01$) and innovativeness, entrepreneurial skills ($r = 0.7789$, $p > 0.01$) and innovativeness. This shows that there is a resilient significant positive relationship between mental skills, physical skills, ethical skills, entrepreneurial skills and innovativeness. Maigida et al. (2013), Raihan et al. (2013), Leke (2010) and Ochiner (2013) supports this finding by agreeing that mental, physical, ethical and entrepreneurial skills training inculcates innovativeness in TVET trainees. This reveals that integration of mental skills, physical skills, ethical skills and entrepreneurial skills fosters innovativeness in TVET graduates.

RESEARCH QUESTION 3:

Is there any significant relationship between mental, physical, ethical and entrepreneurial skills?

In Table 2 above, the respondents' verdict shows that there is a weak positive relationship between mental skills ($r = 0.3980$, $p > 0.01$) and physical skills, mental skills ($r = 0.4357$, $p > 0.01$) and ethical skills, ethical skills ($r = 0.1257$, $p > 0.01$) and physical skills. This result also shows that there is no significant relationship between mental, physical, ethical and entrepreneurial skills but there is a positive weak relationship between them. A study conducted by Khidzir *et al.* (2016) shows that there is no significant relationship between all learning domains but there is a weak positive relationship between mental, physical, ethical and entrepreneurial skills (r Values < 0.4 , $p > 0.01$).

RESEARCH QUESTION 4:

Were innovative worker in Mashariki motors and Car & General Motors companies equipped with mental, physical, ethical and entrepreneurial skills?

Information gathered through interviews revealed that TVET graduate workers who were sampled out as being innovative workers had acquired additional training in practical hands-on skills, ethical skills, and entrepreneurial skills apart from the skills they had acquired in TVET institutions. This reveals that innovative workers in Mashariki Motors and Gar & General Motors had all-encompassing mental, physical, ethical and entrepreneurial skills. Ochsner (2013), Leke (2010), Raihan *et al.* (2013) and Maigida *et al.* (2013) support this finding by indicating that innovative workers have a good grounding in mental, physical, ethical and entrepreneurial skills.

CONCLUSION AND RECOMMENTATIONS

This study concluded that education program that the TVET graduates went through emphasized on mental skills while physical, ethical and entrepreneurial skills were given very little attention. The study also concludes that mental, physical, ethical and entrepreneurial skills have a strong positive significant influence on innovative abilities of TVET graduates. Further, mental, physical, ethical and entrepreneurial skills had a weak positive relationship between them. TVET graduate employees who were innovative in the both Mashariki Motors and Car and General Motors companies had gone through a wide-ranging mental, physical, ethical and entrepreneurial skills training.

The study also concludes that TVET institution did not integrate comprehensive physical (practical hands-on), ethical and entrepreneurial skills in youth training programs.

From the findings of this study, the researcher recommends that;

1. TVET trainers should harmoniously develop TVET trainees' mental, physical, ethical and entrepreneurial abilities to enable them have the skills required in the job market.
2. TVET curriculum developers should integrate mental, physical, ethical and entrepreneurial skills training in TVET programs to enable TVET graduates to be innovative workers, employable and self-reliant.

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