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Assessment of the Needs of ICT Skills on Employability in SMEs: A VFT Approach

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ABSTRACT

The globalised economy comes with the extra demand for ICT skills among the graduates. This is due to the demand if ICT technicalities in performing several basic activities in the workplaces. Majority of studies which concentrate on ICT skills on employability deals with technical enterprises. In non-technical companies such as construction, manufacturing and agriculture, ICT is studied as among the basic skill-set of graduates. However, recently, there has been a special demand for graduates with basic ICT knowledge of recruitment processes. This indicates the growing demand for basic ICT skills among a broad range of professions. However, the type of basic ICT skills required for work is not clear. This study aims to explore and understand the type of ICT skill needed, the significance of each ICT skills on employability and the way of identifying the best graduate based on ICT. This study uses Value-Focused Thinking (VFT) to understand and identifying the possible ways of managing ICT skills on employability. VFT uses in-depth interviews will be conducted to identify the fundamental and intermediate concerns regarding ICT skills on the employability of graduates. This study explored five main fundamental issues which have to be handled effectively by the stakeholders to make sure that ICT graduates are more employable within the SMEs.

Keywords: Employability, graduates, ICT skills, VFT, HEIs and SMEs.

INTRODUCTION

Unemployment is among the greatest challenges in the current world. The rate of increase in the number of job seekers seems to surpass the demand of the same in the employers' side. This provides more challenge for employers to select competent staffs from the pool of graduates. In these situations, Higher Education Institutions (HEIs), graduates and SMEs have roles to play to make sure that they satisfy the needs and expectations of graduates as far as employability is concerned. Employability of graduates encompasses several skills for them to be able to work in the SMEs. Employability can be attributed to a broad range of skill-sets of graduates there a broad range of skills which are needed (Andrews & Higson, 2008; Fulgence 2016). But the growing level of sophistication in the current world, the need of ICT skills among graduated is becoming significant. The graduates are left with questions on which ICT skills should they have to be considered as among be among the most employable groups when it comes to

employability. To answer these questions, this study uses a Value-Focused Thinking (VFT) to articulate the needs of ICT on the employability of graduates.

The outcome of this research will propose guidelines to the SMEs, graduates and HEIs through objectives which should be achieved.

Tanzania is among the countries which fall into among the least developed countries. The ICT skills are among the needs that are required and assessed in interviews. However, linkage of the specific sets of ICT skills with the expected job performance is among the challenging issue worldwide. This study covers this gap by assessing the ICT skill needs from the SMEs perspective, students and the HEIs.

The rest of this paper is organized as follows: Section two introduces the concept of employability and section three discusses the role played by ICT on the employability of graduates. Section four discusses the value-focused thinking while section five presents the decision problems which have been solved by VFT. The methodology which was used to collect and analyse data in this study is discussed in section six followed by the analysis of results in section seven. The rigour of this study is discussed in section eight before the conclusion in section nine.

EMPLOYABILITY

The central focus of this study is to improve the talents of graduate so that to increase their chances for employment. According to Knight and Yorke (2004), employability refers to the ability of graduates to adapt and use their skills on personal and academic perspectives. At individual levels of graduates, the factors which influence unemployment or its delay include individual's class of degree, profession studied, prior class performances and background of social class (Kroft, 2016). Previous studies shows also that in UK up to two-third of the employment vacancies can be covered by any discipline within organisations (Raybould & Sheedy, 2005). In the existing dynamic and competitive industry, employers working staff who have broader skills and can manage labour market flexibility (Pfeifer, 2005).

Employability, therefore, comprises of a broad range of skills. A recent study of Fulgence (2016) grouped the employability skills into five categories: personal qualities, core skills, process skills, initiative and enterprise skills and positive attitudes. In each of the skill category, there is a broad range of related competencies.

This suggests that the skills required by graduates for employability can be regarded as infinite and only sounding ones are being reported and discussed.

Among the previous studies which discussed employability and their methodologies include Andrews and Higson (2008). They employed semi-structured interview involving fifty people in which graduate was asked on their experiences of shifting from education to employment whereas employer was asked concerning graduate recruitment issues and formal graduate employment schemes.

Also, Jusoh et al (2011) analysed the expectation gap by conducting a survey to the fresh graduates who are working. This survey focused on five variables; organisational culture, leadership, communication, decision making, team working, motivation, and development. The results were used to suggest the expectation gaps within the fresh graduates using t-tests.

Felstead et al (2013) conducted a survey to analyse the skills at work in Britain in 2012. Their survey targeted working adults in England, Scotland and Wales accounting up to 3200 respondents. The use of skills was captured using job skills (broad or generic skills). The indicators for broad skills were education, prior training, and initial post-entry learning while Factor analysis was used to produce ten types of generic skills (Felstead et al., 2013).

ICT SKILLS ON EMPLOYABILITY

The current globalised world looks at ICT at a slightly different angle. The demand for ICT skills is increasing in the job market. The job market nowadays considers ICT skills as essential in recruitment processes for most of better jobs (Garrido et al 2011). ICT skills are considered an important asset which promotes competitiveness and improves business productivity. The importance of ICT skills is becoming more significant in sectors such as agriculture, construction, education and in the service industry (Garrido 2011).

Majority of studies in ICT4D which addressed ICT skills in detail in employability concentrates in the ICT companies such as software industry and economic opportunities associated with business process outsource (Picatoste et al., 2018). This poses a need for more research on basic ICT skills for intermediate or normal users on employability.

The level of sophistication of activities has become significant in many sectors to-date. This poses more demand for graduates with basic ICT skills. But the existing challenge is to identify what category of the type of basic ICT skills is essentially required by graduates applying for SMEs? To answer this question, there is a need to understand the common or basic ICT-work related tasks within the SMEs. In that regard, each piece of ICT skill has to have a basis for its demand in the working environment. The best method of acquiring such information is to ask respondents to explain the importance of each of the basic skills. This research aims to act as a platform for SMEs in identifying the basic ICT skills they may need from the upcoming graduates as well as the way they might utilise such skills.

VALUE-FOCUSED THINKING

In Value-Focused Thinking (VFT), values are fundamental to achieving any decision. VFT involve conducting in-depth interviews with stakeholders of a decision context after which their desires will guide the selection of the best alternative to solve their problems (Keeney, 1992). If the solution can't be achieved by selecting the existing alternatives, VFT can also be used to create an alternative to solve a decision problem (R. L. Keeney, 1996). In VFT, instead of alternatives, values are treated as the primary focus in deciding to solve a particular problem. Keeney (1994) asserts that alternatives are relevant only as a way of finding the values. Values are fundamental to all that we do; and thus, values should be the driving force for our decision-making.

An opposite concept of VFT is an Alternative Focused Thinking (AFT). In AFT, decision problems are cantered towards the actions of others such as customers, competitors, government, and stakeholders or by circumstances such as recessions and natural disasters(R. L. Keeney, 1996).

Thus, In AFT, decisions are normally starting from the alternatives followed by addressing the criteria to evaluate them (R. L. Keeney, 1996). Principally, alternatives are relevant only because they are the means to achieve your values.

Therefore, the best option is to explore the values followed by selecting of creating an alternative to achieve them (Keeney, 1996). This is what is in the VFT.

Obtaining clear objectives requires creativity in discussions with decision-makers and individuals concerned about the decision (Keeney, 1996). According to Keeney (1992), an objective is a statement of something that is desired to be achieved by someone. On the other hand, values are principles which are used for the evaluation. According to Keeney (1992), these values of concern are explicitly identified by first identifying the objectives. The objectives in VFT are grouped into means objectives and fundamental objectives. Means objectives are the intermediary ones which lead to the fundamental objectives (Keeney, 1996). The fundamental objectives are the ones which highlight the consequences of the decision and key to driving decision-making (Keeney, 1994).

DECISION PROBLEMS SOLVED BY VFT

VFT was applied to explore the values of mobile technology in education.

Such values were, eventually, used as guidelines for effective implementation and usage of mobile technology in learning environments (Sheng et al., 2010). Also, VFT was used to explore the strategic implications mobile technology have in a publishing company (Sheng et al., 2010). In environmental management, VFT was used to develop the objectives for decisions regarding climate change of the American government (Keeney & McDaniels, 2001). Another application of VFT was in the decision context of tourism management in which the fundamental and means objectives for the vitality of rural areas was shown (Kajanus, 2004).

The fact that VFT has been used in various decision contexts means that it can help to identify objectives (including the previously unknown ones) as well as providing the relationship between them with logical and consistent manner (Morais et al. 2013).

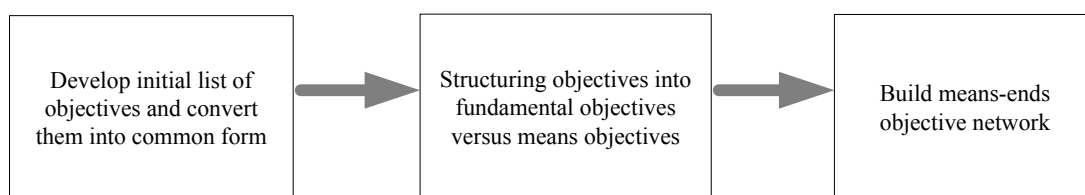
Another strength of VFT in comparison with the AFT in the context of decision analysis shows it is more superior.

The structure of objectives which were generated using VFT was found to be more extensive and hierarchical structure than that which was generated using AFT in all the qualities judged (Leon, 1999).

METHODOLOGY AND DATA COLLECTION

The methodology of this study follows the principles of VFT in decision making. The VFT steps pass through three stages as seen in Figure 1.

Figure 1. Procedures of Value-Focused Thinking (adopted from (Keeney, 1992))



The first step is to develop an initial list of objectives followed by converting them into a common form. The proposed techniques which can help to identify possible objectives include wish-list, alternatives, problems, shortcomings and consequences (Keeney, 1992). By assuming that HEIs, SMEs and graduates have a clue about the operations of the others, the probing questions to identify values will be around wish-list, benefits and problems, limitations and challenges (Keeney, 1994; Sheng et al., 2010). In some cases, alternatives can also be used in case the response requires producing some. These probing questions aim to identify values in respect to the existing challenges, realised benefits, problems faced and limiting factors.

The second step is to structure the identified objectives into fundamental objectives versus means objectives. Fundamental objectives are 'the ends that decision-makers value in a specific context' while means objectives refer to the 'methods to achieve ends' (Keeney, 1992). Separating means objectives from fundamental objectives is done by asking "Why is that important (WITI)?" in each of the identified means objectives from the respondent. Asking WITI questions helps to force respondents to think critically about the relationships between objectives (Reynolds & Gutman, 1988; Sheng et al., 2010). Asking WITI results in two main outputs: (1)

this objective is among the essential reasons for interest in the situation and is fundamental for decision making and (2) this objective will help understand implications for other objectives (this is called means objective) (Sheng, Nah, & Siau, 2005). Therefore, the fundamental objective will be achieved if the WITI approaches do not help to generate any more means objective.

The third step of VFT is to build the means-ends objective hierarchical network. This network shows the interrelationship between the identified means objectives and the way they influence fundamental objectives. This process is also called Means-Ends Chain theory (MEC) (Reynolds & Gutman, 1988).

Question Set for HLIs (lecturers, curriculum developers, managements) on the decision context "Grooming the best possible talents". Due to the creativity needs in acquiring information from interviewees in VFT, a discussion document is used instead of a questionnaire. The questions or statements are presented according to the techniques (such as challenges, benefits, wish-lists and problems) which are used to identify the objectives according to Keeney (1994). The issues which will, therefore, need to be discussed with graduate and SME managers/supervisors include:

1. What is important to you in ICT skills on employability? This discussion aims to identify the needs or goals as well as determining the reasons for requiring graduate to have ICT skills for them to fit in work.
2. What should be done to raise the level of basic ICT skills needed for work? This aim to identify wish-lists and alternatives. These two are important in identifying values that lead to objectives.
3. What are your current concerns regarding the level of ICT skills of graduates in comparison to the requirements? The response from this question helps to identify the problems and/or shortcomings which will help to identify the values in such e.g. A concern like "employees fail to use computer software effectively" indicates that they need to have basic knowledge of the current computer software.

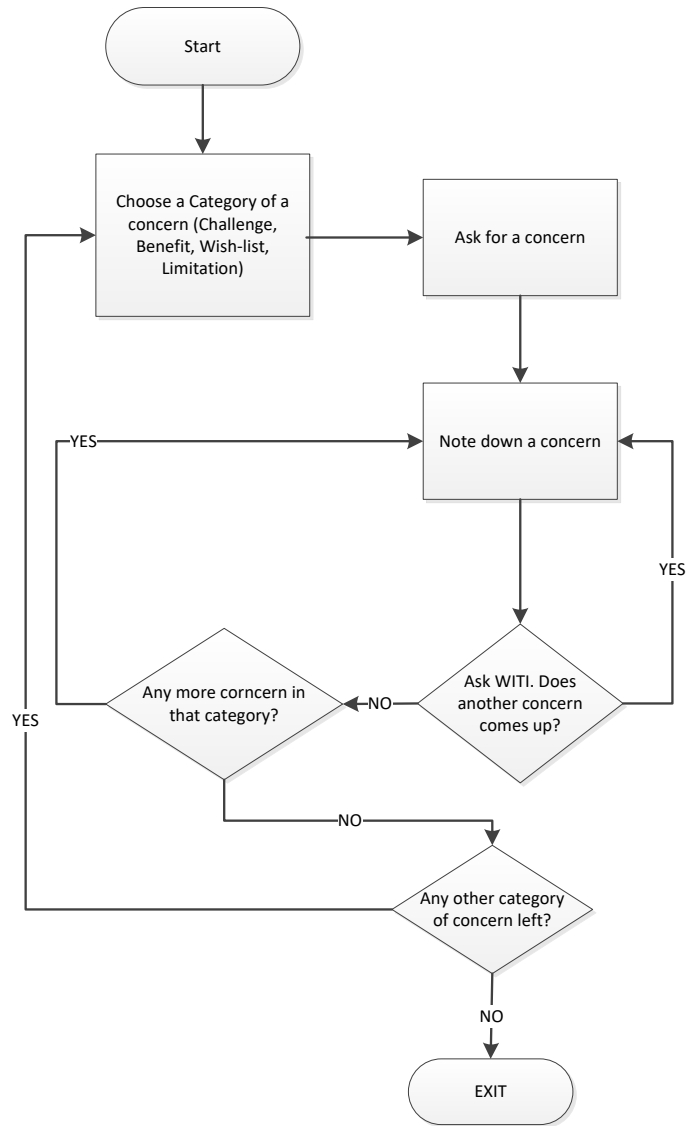
4. What can be done to ensure that the ICT skill-set of graduates suits SMEs? Here the aim is to identify aspects which can be solved now e.g. Issues like curriculum, lifestyles etc.
5. What are limitations facing grooming ICT skills into potential graduates? Here the issues which pull back the efforts of stakeholders are raised.
6. If you have to evaluate the required ICT skills for a graduate in recruitment. How would you do it and what will indicate ICT suitability of a candidate? Aim of this question is to identify any possible alternatives.

This interview approach has been previously used by Nah et al (2005) and Drevin et al (2007). In a study of Drevin, an assessment of ICT security in the educational institution was explored by interviewing key personnel, one at a time. In studies like this, the total number of interviewees is normally known after a 'saturation point' has been reached. The saturation point is when there is no additional data which is found by the researcher for a specific category in a study (Glaser & Strauss, 1967). Drevin et al (2007), example, stopped when 10 respondents were interviewed and Nah et al (2005) stopped with seven respondents.

This study involved aimed to interview at least 20 respondents but the researcher stopped when interviewing the 12th respondent after noticing that the responses were starting to repeat (logically). This indicated that the saturation point for this study was reached. The characteristics of respondents were holding at least a bachelor degree (in any field) for graduates and HEI representatives and the supervisors of SMEs, and having experience of 4 working years for the SMEs supervisors/managers. This study covered SMEs which belong to travel industry, restaurants, entertainments, retail shops and bars.

In this study, a flowchart was developed to assist an interviewer of the key items as well as steps in coming up with concerns and the identification of which ones tends to influence the others after asking a series of WITI questions. As seen in fig 2, the first step is to select a starting category out of benefits, challenge, limitation and wish list. Once a respondent selects a category, will be prompted to mention any concern followed by being asked again to explain why is the said concern important to him or her. The response will then be checked whether can be explained more to resulting in another concern or not. This sequence of step repeats until all the concerns within a single category are over and all categories are over. The five fundamental objectives which are seen on the right hand side of Figure 2 were deduced by compiling the issues which were more appealing from the responses of the interviews in the means-objectives seen on the left-hand side.

Figure 2. Steps in performing Laddering technique for this study



RESULTS AND DISCUSSIONS

The results of this study are represented in Table 1, in the form of a means-ends objective network. This table shows results in two main sides. The left side shows the key concerns concerning ICT needs in employment and the way they influence each other. The arrow between the concerns (means-ends objectives) shows how they influence the next ones. On the right-hand side, the logical grouping of means objectives results in fundamental objectives of the context of this study. The fundamental objectives represent all the means objectives at a high level. The fundamental objectives which were compiled from this study are explained in detailed form in the following sections.

A. Ensuring Specialisations in Training and Employments

This study has identified cases where ICT student graduates without knowing what they know better in their profession. In these circumstances, these graduates are not aware of which ICT task they can perform better than others. Situations like these are dangerous because, in normal circumstances, it is unlikely that a student can perform better in all aspects of ICT. Therefore, this study suggests students think, in their earlier stages, of the best career of ICT they are good at and concentrate on the modules which will make them much better. However, this could be achieved if the colleges will expose to the students all possible ICT based careers so that they can assess themselves based on their interests and existing motivations.

The specialisation is also identified in an angle of employments. This is due to a fact that a broad-minded graduate might get an excuse of underperforming in employment when the job role is not specific enough. This study proposes treating specialisation as a sort of contract between a graduate and an SME upon which an employee can be evaluated. Therefore, curriculum developers in the colleges have to make industrial visit and research periodically in attempting to identify any adjustments in the job markets and incorporate them as soon as possible. By doing that, ICT graduates will be aligned with job demands. Ensuring Competence of Lecturers and ICT Learning Environments.

B. Results have shown that the best ICT graduates are moulded by the best lecturers.

Results have shown that the best ICT graduates are moulded by the best lecturers. Some of the respondents have mentioned poor lecturers as among the problems for their incompetence. This is among the critical problem as far as their employability is concerned. The lecturing staffs in Tanzanian colleges do not pass into professional teaching courses. Instead, there is a minimum cut-off academic qualification which needs to be attained in the undergraduate degree program of specialisation. Therefore, teaching skills which relate to the methodology are normally lacking to most of the lecturers. The National Council for Technical Education (NACTE) and the Tanzania Commission of Universities (TCU) have set regulations which demand academic staff to pursue further training which can equip them with such methodological aspects. However, the competence of ICT lecturers requires extra skills which come along with the advancement of technology itself. For example, the approach of delivering materials for modules such as computer programming and software engineering needs to be adjusted with the variations on the ICT usage within the society. This is due to the emergence of more advanced technologies which provide more options for using technology within the society.

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D. Improving ICT learning Environments

The nature of ICT demands continual investments in learning environments. This is a challenging issue in the developing economies where the funds are not enough to fit for the purpose. Most of the ICT infrastructures in the colleges come from the aids from the government or NGOs. In some circumstances, administering the ICT systems in the learning environments needs proper management and funds. For example, one lecturer in public in Tanzanian public college expressed dissatisfactions on the way ICT systems in the computer laboratories are managed. Among the areas which are mismanaged include poor accounts management and network speeds (in server-based thin client platforms), overcrowding and few opportunities for the student to use computer labs and unavailability of teaching software packages in the computer laboratories. This study asks the management in the HLIs to treat ICT in its speciality because innovation demands special attention in terms of financial and organisational perspectives.

Table 1: Means-ends objectives of ICT on employability in SMEs

<p>Improving programming skills</p> <p>Example: Improve awareness of key programming languages</p> <p>Ability to apply programming concepts in performing ICT tasks</p>	<p>Improve specialisation in Businesses</p> <p>Examples: Demonstrate how ICT is used to accomplish specific tasks</p> <p>Improve ability to select ICT skills used to accomplish various key tasks</p>
<p>Enhancing Practical Training</p> <p>Example: Providing a chance for ICT students to apply class lessons in solving real-world problems</p> <p>Assessing the practical aspects of ICT</p>	<p>Ensure clarity of careers to Students</p> <p>Example: Specifying possible key careers ahead of graduates of ICT</p> <p>Enabling students to select careers based on their ICT interests</p>
<p>Maximising Task Completeness in Jobs</p> <p>Example: Ensuring that employees complete given tasks</p> <p>Improve the ability to work independently</p>	<p>Maximise learning of new techniques</p> <p>Example: Encouraging ICT students to keep on learning new concepts</p>

Acquisition of up-to-date knowledge Example: Keeping trend with technological advancements Ability to solve problems with up-to-date tools and techniques	Ensuring effective use of ICT in companies Example: Discovering the possible areas to be improved by ICT in the firms Ensuring that the ICT budgets are used effectively
Improve awareness of ICT in early-stage education levels Example: Enabling graduates to understand the fundamentals of ICT Providing the opportunity of studying ICT for longer time	Maximise supervision of practical training Example: Ensuring that the practical aspects are well understood in parallel with theoretical knowledge Improve the ability of students to practice their theoretical knowledge effectively
Introduction of ICT specialisations in Colleges Example: Introducing specific key specialized roles within working environments Providing examples of how ICT is applied to solve real-world problems	Improve Problem Solving Skills Example: Promoting space for students to solve several business problems using ICT
Introducing Entrepreneurial skills in schools Example: Providing areas which ICT can play the part on start-ups Elaborate to students how ICT can be an investment	Ensuring the acquisition of Suitable ICT candidates Example: Ensuring that the ICT students have an interest in the profession Providing screening exams to students who want to pursue ICT courses
Maximise creativity Example: Introducing courses which improves creativity among students Demonstrate how ICT requires creative thinking	Maximise practical Interviews Example: Ensuring that ICT is interviewed by practical activities rather than theory Imposing demonstration or set-ups of equipment as part of interviews
Maximise Competence of Lecturers Example: Ensuring that Lecturers have enough backgrounds to give students up-to-date materials	Improve ICT learning Environments Example: Ensuring that the colleges have a conducive and reliable ICT learning environment

E. Improving Creativity in ICT usage

Among the challenges facing SMEs concerning the graduates include lack of creativity. It is claimed that only a few of them can be able to solve ICT based problems on their own. Creativity is important because the majority of problems which need to be solved new, thereby, need confidence and skills for solving them.

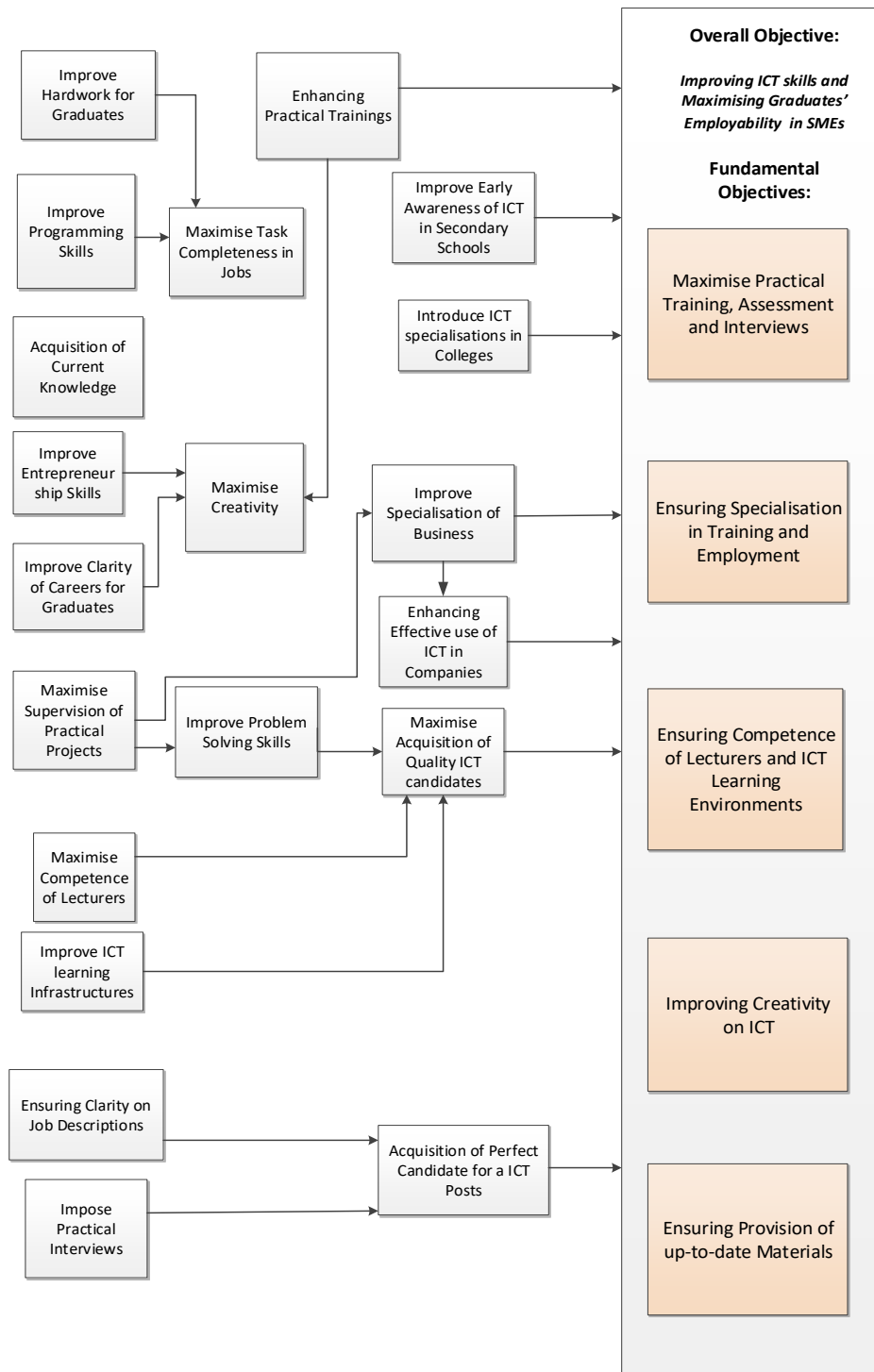
The initiatives which are in place in Tanzanian include twisting the curriculums in some of the colleges from Knowledge-based Education Training (KBET) to Competence-based Educational Training (CBET). However, this transformation adjusts only the methodological aspect of teaching, leaving the professional-based contents unchanged. Therefore, the remaining approach could be to ensure that there are added contents in the syllabuses and assessment parts which will be specifically assessing the creative aspect of all the ICT modules.

F. Ensuring Provision of up-to-date Materials

Unlike modules such as law, history and geography, ICT related modules are always changing as days pass by. Eventually, the contents of the modules need to be adjusted frequently to meet the market demand and trend movement. By doing so, they will increase their chances of being employable to the SMEs. However, this will demand to keep lecturers, students and colleges up-to-date. While keeping lecturers up-to-date might be achieved by providing them with ongoing training and providing them access to the current sources of information such as

libraries and training, the case of colleges might be difficult. This is because there will be the needs to phase out some of the computers, software and network equipment after some time, which is difficult due to insufficient financial capabilities.

Figure 3. Means-ends Objective Network (MEC) Diagram for Employability of ICT graduates in SMEs



RIGOUR OF THE STUDY

The methodology which was used to guide the data collection and analysis is based on VFT, which is a well-recognised for exploring values based on decisions of respondents in a specific contextual environment. Recordings of the interviews were transcribed manually by the author. The discussions and was supported by the opinions of interviewees and on the concerns as guided by the laddering technique (Reynolds and Gutman, 1988). Laddering involves in-depth, one-to-one interviews to develop an understanding of how consumers translate the attributes of products into their personal values (Reynolds and Gutman, 1988). The sample size was achieved when no more new objectives from respondents, which was a saturation point (Guest et al, 2006). The saturation was reached after the 12th respondent was interviewed.

CONCLUSION

This article has explored the wishes, problems and concerns of SMEs concerning employability of graduates from the Tanzanian colleges. The methodology used was grounded to Value-Focused Thinking. This methodology guided the process of data collection and analysis. The deliverables of this research is a set of means-ends objectives which point out key issues which are important to the ICT graduates to work well within SMEs. This research compiled the means-ends objectives into five fundamental objectives that address the main areas which, when solved, will improve the employability of ICT students.

The future studies could perform a quantitative measure of the extent to which the fundamental objectives influence the employability of graduates in the SMEs. Another study could be performed to assess the employability of ICT graduates but in a specific industrial sector such as telecom or marketing.

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