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The Impact of Competency Models on TVET Instructors in Apparel Pattern Making Processes in Ghana: A Qualitative Study

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ABSTRACT

Competency-based pedagogy significantly increases the likelihood of adequately preparing students for the world of work. This is a major objective of TVET. Thus, the goal of this inquiry was to examine competency models and the teaching of apparel patternmaking in Ghana. It identifies the origins and introduction of competency-based training models in Ghana and examines the gaps that exist between the desired competencies needed for teaching the subject successfully and the challenges that are affecting instructors' competencies. This study employed the qualitative approach. The target study population was the instructors of technical universities in Ghana. Consequently, the purposive sampling technique was used to select 23 samples from four technical universities. The major empirical findings of the study demonstrate that instructor's approach to pattern making has duly changed to accommodate the unique competency requirements necessary for effective teaching and learning of pattern making in the various technical universities. To enhance training, it is recommended that real industry working environment be replicated in a school setting or by affording more opportunities to collaborate and utilize the workplace as a learning station.

Keywords: Apparel, patternmaking, CBT models, TVET.

INTRODUCTION:

In a modern labour market with permanent innovations and the requirement for lifelong learning (Verdier, 2013), the ability to assess the competency-based approach is more important than having a broad range of technical and vocational know-how learned from theoretical coursework and imitation of skills by learners. However, in several developing nations including Ghana, there is still a strong tendency to equate teaching and training in Technical Vocational education and Training (TVET) without competency-based models with other developed countries such as Germany and Australia, who use competency-based models. This according to ILO (2010), is often the least suitable preparation for lifelong learning where distinct problems and yet to be known job and skill requirements will require ongoing problem solving without external coaching, underlying the critical role played by teamwork and self-learning capacity for present and future workplace responses.

The opening up of a competency-based model in TVET and the efficient application of new teaching/learning approaches could be a means of liberalising learning for instructors (Mbarushimana, & Kuboja, 2016; ILO 2015). It also offers a much more relevant and useful way of acquiring competencies that are appreciated by enterprises, students and precisely because of its relevance and validity for the transition from TVET institutions to work (ILO 2010). As Wahba (2012) points out, the strategy of competency models in TVET is based on occupational competencies which are founded for each career field and job title. A competency-based TVET system (McClarty & Gaertner, 2015; Wheelahan, 2012) adopts combinations of dominant techniques to ensure that the needs of different industry sectors such as the fashion industry are addressed.

In this regard, techniques such as Management Information Systems (MIS), Knowledge Management (KM), Monitoring & Evaluation (M&E) and Competency Assurance Management Systems (CAMS) are commonly

used (Soares, 2012). Competency-Based Training (CBT) is an industry and market-driven education and training program based on well-defined industry-generated standards (Santioanni, 2016; Jonnaert et al. 2006). These industry standards are the basis for which the curriculum, assessment, (Meyer-Adams et al. 2011) and learning materials are designed and developed. CBT programs concentrate on what the student is supposed to be able to accomplish in the workplace as against merely having theoretical knowledge (Torres et al. 2015). It is, therefore, a training program which guarantees that students acquire the essential knowledge, skill set and values or attitudes to be successful in the workplace (Guthrie 2009).

Aldrich (2013) describes fashion as a cycle that moves in a visible pattern, as fashion changes; the ideal figure and shape also change, however, not all designers who can design and sew to meet the changes ongoing in fashion. Pattern making methods were developed to address the changes in the silhouette, and this later became a significant aspect of the fashion world. MacDonald (2010) explains that the development of a garment comprises different processes, and pattern construction is the basis of clothing and fashion design. A pattern is, therefore, the core of any garment development process. It is the blueprint or template used to cut out the fabric which makes a garment. A valid pattern has balance and reflects the design accurately.

Joseph Armstrong (2010) acknowledges that patternmaking is an art. It is the art of manipulating and moulding a flat piece of fabric to correspond to one or more bulges of the human figure. Patternmaking is a bridge function linking design and production. A sketch can be transformed into a garment via a pattern which interprets the design in the form of the garment components. In the apparel industry, patternmaking is essential in transferring two-dimensional designs to real garments, because proper pattern making ensures a good fit for the target consumers (Kim & Park 2007).

A combination of these techniques must be mastered to enable the fashion designer to be competent in coming out with garment components that can produce beautiful and well-defined clothing items (Amaden-Crawford, 2012). The ability to create a fashionable collection to meet consumers taste is a source of joy for every fashion designer as this brings satisfaction to the designer and also meets clients' expectation (Armstrong 2010). An acquisition of a combination of pattern technology skills is, therefore, essential for any clothing manufacturer because it helps in coming out with intricate styles that give perfect fit (Fischer, 2009).

However, despite the importance of this combination, many craftsmen in Ghana face challenges due to the lack of in-depth knowledge in their respective trade areas. This has a debilitating effect on their ability to create attractive designs to meet international standards and make strides in meeting clients demand for socio-economic development. Kahn et al. (2005) emphasise that greater challenges continue to exist on the quality in cut assembling and finishing processes. To change this trend and allow fashion designers to take full advantage and participate effectively in the global economy, there is the need for fashion designers to be versatile and competent in pattern construction and this can only be achieved if the instructor is skilled enough to impart the right and accepted techniques expected.

It is essential hence, to explore pattern making instructors' familiarity with pattern technology competencies used for teaching pattern making, find out the challenges they face and develop strategies that will help overcome these difficulties. It is envisaged that related studies and opinions on models of pattern making processes, instructors' competence, need for pattern technology competencies, and history of clothing pattern making processes will be visited. ADB (2010) explains that Vocational training provided by the TVET sector increasingly misses the demand of the labour market. The labour market assessment identified 'five major areas of current and apparently likely continuing skills shortages (p. 4).

These include furniture, construction, construction sub-trades (masonry, carpentry, electrical, plumbing), tourism and hospitality and fashion design. The sobering forecast, identified by the assessment, is justified by the fact that the number of needed skilled workers trained by TVET institutions, has dropped in recent years. On the one hand, training in these trades is not attractive for the youth, because it has a bad image. On the contrary, the institutions are not keen on offering sufficient and accepted standards of training because it is too challenging and has a bad reputation for them as well. On the contrary, Higher Diploma programs in IT and business administration have become the fastest growing component of TVET, despite an even faster-growing oversupply of graduates (Badawi 2013; Wheelahan, & Moodie, 2011).

Also, more efficient delivery of TVET, as well as an assessment of its functional outcomes through cooperation in TVET systems between enterprises and schools and with other stakeholders, is still far from generally applied. The sharing of responsibility with employment stakeholders, especially when it comes to certification, measuring output orientation of learning and better recognition of prior learning can still be much improved (Obwoge, 2016; Marope et al. 2015). Instead, in many countries, TVET and existing labour market policies do not always facilitate the school to work transition, thereby handicapping young people especially in obtaining a

head start in working life.
For TVET systems to become more flexible and responsive to new skill demands, which tend to be difficult to foresee and increasingly diversified, there is the need to assess the impact of competency models in TVET instructors. As this can help in upgrading the training provided and labour requirements and responsiveness to labour market conditions (Raimi & Akhuemonkhan, 2014). This study thus seeks to contribute theoretically and empirically to the advancement of the professional competence of TVET instructors in Ghana by evaluating the impact of competency models on TVET instructors in apparel pattern making processes.

LITERATURE REVIEW:

Technical and Vocational Education and Training and Definition Issues:

Ideally, TVET programs are intended to develop the skills that are most demanded by the market as well as contribute to the socio-economic and cultural welfare of people. They must be designed to meet the requirements of the available employment opportunities, increase productivity, and eventually lead to an improvement in living standards (Lemma, 2017; Gamble, 2013). These Competency Models can in different settings be the master key to unlocking poverty (Guthrie, 2009), promoting sustainable development fundamentals such as self-reliance in otherwise the unskilled youths by helping them to adapt to a fast-changing and globally competitive knowledge-based community.

Definitions:

According to Education International (2015), defining TVET as a sector within the education system poses some difficulties. For instance, general and academic education is seen as one that builds analytical skills, knowledge and critical thinking, while TVET develops craftsmanship, hands-on experience and practical problem-solving. Nonetheless, this simple discrepancy does not hold up to scrutiny (Cedefop 2015). Analytical and critical thinking skills are needed in the case of a good carpenter or electrician who must routinely make judgements to solve problems. Equally, a good surgeon needs an extensive set of practical skills to operate a patient masterfully. These simple differences can also lead to misperceptions and academic drift of vocational institutions (Raimi & Akhuemonkhan, 2014; Brockmann, & Winch, 2011)) or a rationalisation of higher education (Keep, 2015; Bosch, & Charest, 2009).
Nonetheless, TVET has been defined by many and varied authors. For instance, Tripney et al. (2013) broadly defined TVET as the acquisition of knowledge and skills for the world of work. According to Winch, (2013) and Wolf (2011), TVET encompasses those aspects of the educational and training processes as well as the study of technologies and allied sciences, attitudes and the acquisition of practical skills as well as knowledge related to professions in different sectors of economic and social life. TVET thus prepares people not only with vocational skills but with a broad range of knowledge, attitudes and expertise that are now recognised as indispensable for meaningful participation in work and life. Benefits of TVET include self-awareness and self-esteem, and strengthened interpersonal, citizenship, communication and entrepreneurial skills (UNESCO 2015).
For UNESCO (2017), TVET is an activity or a set of activities designed to transmit theoretical knowledge and professional skills that are required for certain types of jobs. He continued that, TVET includes every form of education that leads to the acquisition of qualifications related to a profession, art or employment which provides the necessary training and the appropriate skills as well as technical knowledge. So that students can practise a profession, art or activity, independently of their age and level of training, even if the training program contains elements of general education (Badawi, 2013).
TVET according to Green et al. (2000), relates to a series of learning experiences relevant to the world of work and which may occur in a variety of learning contexts, including educational establishments and the workplace. It involves learning, intended to cultivate the skills for practising specialised occupations, as well as learning, designed to equip students for entry or re-entry into the world of work. In both instances, the learning may be expected to lead to direct labour market entry or to serve as a basis for entry into further education and training for specific occupations. By interpretation, therefore, TVET embraces a diverse spectrum of learning activities that are difficult to appreciate in any single classification (Gallacher et al. 2012).
Some attempts have been made to classify types of non-formal and informal learning, especially regarding forms of on-the-job training (see Tikly, 2013; Brown et al. 2001; Ashton et al. 1999). Although seemingly abstract, the discussion on what TVET is and what it constitutes is in the first place a question of practical discussion. For instance, a question of definition leads to a further question of the place where TVET is provided, who TVET students are, who TVET teachers (Grollmann & Rauner, 2007) are and crucially under which types of conditions such teachers work.

Table 1: Variations between CBT and Traditional Training

Features	CBT	Traditional program
What Students Learn	Based on specific, precisely stated students' outcomes called competencies or tasks that have been recently verified as being necessary for successful employment in the occupation for which the students are being trained. These competencies are made available to all concerned and desirable precisely what the students will be able to do on completing training.	Uusually based on textbooks, reference materials, course outlines or other sources removed from the occupation itself. Students rarely know what they will learn in each successive part of the program. The programs are usually built around chapters, units, blocks and other segments that have little meaning within the occupation. Instructors focus on covering material.
How the students learn	Provide students with high quality, prudently designed, student-centred learning activities, media and materials designed to help them master each task. Materials are organised so that each learner can stop, slow down, speed up or reiterate instruction as required to learn effectually. A central part of this instruction is intermittent feedback during the learning process with opportunities for learners to correct their performance.	Rely primarily on the instructors to personally deliver most of the instructions, lectures, discussions and other instructor centred learning activities. Learners have little or no control whatsoever over the pace of instruction, and usually, little periodic feedback on progress is given
When students Proceed from task to task	Provide each trainee with enough time (within reason) to fully master one task before being allowed or forced to move on to the next.	Usually, require a group of students to spend the same amount of time on each unit of instruction. The group then progress to the next unit after a fixed amount of time which may be too soon or not soon enough for many individual trainees.
When students learn each task	Require each trainee to perform each task to a high level of proficiency in a job like setting before receiving credit for attaining each task. Performance is compared to present, fixed standard.	Are highly reliant on paper and pencil tests and each student performance is usually compared to the group norm students are allowed (and usually forced) to move on to the next unit after only marginally mastering or even failing the current unit.

Source: Brown (1994)

The different approaches to competency models evident in the literature:

The higher education business is abuzz with new models, innovations, and new ways to deliver content, engage students and measure outcomes (Helix Education 2014). As technology enables new learning experiences, instructional methods must also be revised to link this new knowledge to practice to create change in the student experience. According to the Helix Education, an appropriate approach to competency models includes personalised learning and adaptive learning.

Personalised Learning:

In a personalised learning experience, the curriculum stays fixed. The subject itself does not change as students encounter an identical flow of information in the same order as their friends. Nevertheless, a personalised study plan is created and updated as a consequence of pre-assessment activities to recommend modules or topics that may be skipped and where the student should direct his or her time, to develop excellent skills and knowledge. Personalized Learning has been described in the industry as a learning process. This applies to various aspects of education delivery which offer students the choice of their activities, ways of engaging with their mentors and peers, and other options (Everhart et al. 2014). The EDUCAUSE Learning Initiative (ELI) describes Personalized Learning as a tool that assists educators to design student-centred instructional models. ELI depicts Personalized Learning as endeavouring to stimulate student learning by tailoring the instructional setting

to address the unique needs, skills, and interests of each student.

Adaptive Learning:
Adaptive Learning strategies according to Helix Education (2014) create a student experience that is modified based on a student's performance and engagement with the course materials. 'Adaptivity' is different from personalization in that it takes a more sophisticated, data-driven, and in some cases, non-linear approach to remediation. This supports Education Growth Advisors (2013) assertion that, at a simple level, an adaptive learning system behaves differently based on how the learner interacts with it. In Adaptive Learning, the actual learning experience changes based on the individual's performance. The instructional experience is organised to meet the needs of the individual learner and challenge that person at the most appropriate level. In an Adaptive Learning experience, the curriculum is adjusted based on the student's baseline knowledge level.
The Allen Consulting Group (2006) examined the records and reports concerning employability skills in training packages. They proposed an integrated assessment of employability skills with detailed reporting which would be useful to employers in the unit of competence level enhanced with student portfolios of evidence. This was suggested because it would be relatively easy to implement. The model endorsed by the National Centre for Vocational Education Research (NCVER) (1999), involves the assessment and reporting of employability skills embedded in the individual units of competency in training packages. NCVER (2003) specified that fostering the development of generic skills, needed to be a joint responsibility of teaching institutions, individuals and employers, with the various groups working in partnership where possible.

Training packages:
Training packages Guthrie (2009), are made up of nationally endorsed components including Units of competency; which define the knowledge and skill, and the utilisation of that knowledge and skill to the desired performance needed in the workplace. Units of competency comprise a variety of functions, applicable to the workplace and are relevant to an enterprise. (i) Qualifications; are formulated by packaging units of competency into meaningful groups to form qualifications. (ii) Assessment guidelines; which provides an industry framework for assessing competency in the specified industry, industry sector, or enterprise. Training packages do not designate how a person should be educated. Trainers develop learning and assessment strategies to support individual learners' needs, abilities and circumstances.

Accredited courses:
Not all competency-based training is within training packages. Where there are no training packages, courses may develop to meet industry, education, enterprise, legislative or community needs may have those courses accredited by the state accrediting organisations such as the national accreditation board (NAB). Accredited courses are generally accepted, and their delivery, assessment and certification are covered by a corresponding QA mechanism as training package qualifications. Certified courses are based on nationally approved units of competency. In practice, several accredited courses are competency based (Schofield & McDonald 2004).

The Practicality of Pattern Designing:
Joseph Armstrong (2010) describe pattern designing as the creative process of all the stages of folding, cutting, copying, modifying and experimenting with the relevant basic blocks to obtain the first set of pattern pieces that reflect the fashion design illustrated. Pattern makers group their rules of interpretation according to the types of the garment. A pattern maker will classify a new fashion design into the relevant garment type so as to apply the set of pattern making rules to obtain a close basic style. Fashion features are then added, modified or deleted from this basic style to get the final design. Pattern making is thus a three-step process that covers fashion analysis, pattern design and pattern making (MacDonald, 2010).
In the analysis process, a new design is disintegrated into a basic style which closely resembles this new design and the new fashion features needed through appropriate classification of that garment type. Pattern-making rules are then applied to subdivide this three-dimension garment design into sections that are more easily spread into two-dimension pattern pieces. Subsequently, these pattern pieces are modified to take into account those new fashion features in the design. Only then are the pattern pieces drafted out. The basic style is made up of several sections of a garment that can easily be reduced to their secondary forms as illustrated in Figure 1. By implication, patternmaking requires a lot of applications and hands-on experiences.

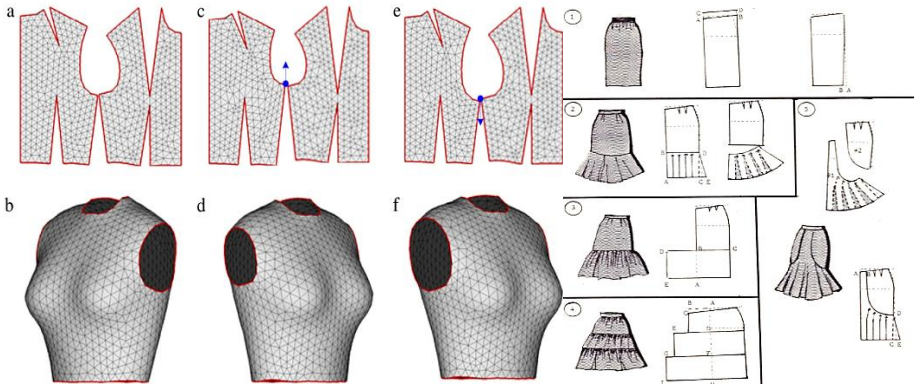

Figure 1: Secondary forms Source: Meng et al. (2012)

Pattern Making in Garment construction:

Fashion designers begin creating patterns by forming either a two-dimensional or (McKinney, 2007) three-dimensional pattern, using one or more of the patternmaking techniques; flat pattern making, pattern drafting, reversed engineered/knockoff, pattern draping, and computer-generated patterns. The approach chosen is contingent on the design and the particular working styles of the designer and/or the patternmaker (Joseph Armstrong 2010).

The flat pattern making is a design process where a basic pattern is developed into a desired design to fit a particular figure. A basic pattern block is selected from which to construct the design. Alterations are then made on the basic patterns by either adding fullness, moving seam lines, changing necklines etc., until the pattern resembles the desired design. The sloper is the starting point for flat pattern making (MacDonald, 2010). The basic pattern already has a designated shape and ease. Pattern drafting, on the other hand, involves measurements derived from sizing systems or accurate measurements taken on a person, dress or body form, measurements for chest/bust, waist, hip and so on are taken, construction lines are drawn and ease allowances are marked on the paper to complete the pattern. Drafting may be used to create basic, foundation or design patterns.

Pattern draping is the manipulation of fabric on a three-dimensional form to obtain perfect fit and harmony between the fabric, design and the silhouette of the individual (Amaden-Crawford 2012). Many designers prefer to use draping methods to create original/unique designs as the proportion, fit, balance, style lines etc., of a design, can easily be seen as precisely as it will look on the figure. Working with fabrics gives a fashion designer greater inspiration and a better indication of the flow and performance of a fabric. Reversed engineering/knockoff is a method of pattern making by which the pattern maker copies another garment as a starting point for a new design. Thus, it involves taking the garment apart and tracing the shapes of the pattern pieces to sew a new garment. However, with the computer-generated patterns, Computer-aided design (CAD) software is used to produce patterns for the desired garment (Kim, & Kang, 2003).

METHODOLOGY:

This study employed the qualitative approach. Qualitative research (Creswell 2014) is exploratory in nature, and its methodologies allow for a more productive and more in-depth understanding of a process or a phenomenon. Again, as inferred by Patton (2015) the qualitative approach to research is in-depth using a range of techniques, which aims to understand why people think, feel, react and behave in the way that they do. However, samples tend to be small (Gentles et al. 2015) as the aim is to generate concepts, strategies, or, an appreciation of processes that govern groups or institutions. The benefit of qualitative approaches according to Maxwell, (2013) and Guest, et al. (2013) is that the researcher does not start with a hypothesis that needs to be proved as this can make the study very rigid. Instead, it is an open-ended approach that can be adapted and changed while the research is ongoing, which enhances the quality of the data and insights generated.

Furthermore, the qualitative approach according to Leavy, (2017) aims to generate in-depth accounts from individuals and groups by talking with them, watching their behaviour, analysing their artefacts, and bearing in mind the different contexts in which they are based. The target study population was the instructors of technical universities in Ghana. Consequently, the purposive sampling technique was used to select four technical universities. According to Gentles et al. (2015) and Oppong (2013), purposive sampling techniques are widely used in qualitative research for the identification and selection of information-rich cases for the most effective use of limited resources. Thus, purposive sampling technique was used to select 23 samples and interviewed.

FINDINGS AND DISCUSSIONS:

Do you believe the roles and responsibilities of TVET instructors have changed considerably in the last few years? If yes, how has it changed?

In the last few years, the roles and responsibilities of instructors in TVET have changed considerably (Powell, & Powell & McGrath, 2014; Bosch, & Charest, 2009; Pahl & Rauner, 2009; Grootings, & Sören 2006). These changes have challenged vocational instructors to adopt new teaching and learning approaches to prepare them for their new and constantly evolving roles. Based on this, instructors were asked to indicate whether their roles and responsibilities have changed over the years. The general responses show there is a general consensus among the respondents to the effect that their roles and responsibilities have indeed changed considerably. Some of the responses to that effect have been given below;

> *"...For me I take it from the last three decades, our roles and responsibilities have changed remarkably. Now it is the competency-based approach adopted all over the place. Previously students were spoon-fed, but now the emphasis is on how best students can contribute to the achievement of the goals of the lesson and that means they have to be highly involved in the teaching and learning process."*

Another respondent added that;

> *"Previously it was traditional instruction, but now even in some circumstance, I hear one of the technical universities has moved into a virtual learning environment which is helping very much. There has been a shift in teaching to learning through a more interactive and engaging learning environment for instructors and students to work together effectively."*

Additionally, another instructor remarked;

> *"Yes!! TVET itself is going through many changes and as a result, influences our roles and responsibilities…"*

She was quick to add that;

> *"Now our method of teaching has changed from knowledge transmitter to that of a facilitator, co-learner, and sometimes as a knowledge navigator. Our new role demands a new way of thinking, understanding and ultimately different approaches to planning our lessons now with a new vision of the learning process which is the competency-based approach; actually focusing on what students can do. Learners now have the responsibilities of their own learning as they seek, find, synthesise, and share their knowledge with others."*
>
> *"...since the implementation of the CBT programme, I have continuously put in an effort to improve my teaching methods. We have found the CBT concept to be worthwhile and me personally I've become more confident in teaching now than ever before..."*

From the responses, it could be observed that the interview respondents contrasted their experiences prior and current dispensations of the competency-based approaches to teaching at the technical universities. More so, it can further be noted that there is generally more effort on the part of instructors to involve students effectively in the teaching and learning process. To them, it is crucial for getting students involved by getting them to discover how to do things by themselves with the instructor being the facilitator. To that end, technical universities' adopting the competency-based model to teaching is requiring that instructors adopt different roles and responsibilities to augment student learning.

In your opinion, how have the changes influenced instructional delivery in this institution?

The TVET institutions engage two categories of instructors, those in charge of academic subjects, and those who are responsible for technical and vocational subjects as well as practical training in the workshops and laboratories. The interview responses give the impression that instructors recognize the changes in instructional approach has influenced how they go about their instructional delivery. Below are some selected comments;

> *"...the successful implementation of a competency-based approach to instruction depends on the quality of instructors. This is because competency-based models are built on the philosophy that almost all learners can learn equally well if they receive high-quality instruction and if sufficient time is given for the intense concentration on the content in the CBT modules."*

"... because of this approach, we dedicate more time and efforts to support students properly during their training sessions, for example by offering the opportunity for re-submission of tasks unsatisfactorily done, providing feedback…"

Another respondent remarked;

"…my lessons are now project-based, and all I do is to come up with the concept and students moot about how to develop the concept into products…"

"…because of the CBT, we are expected to have an indirect influence on student's acquisition of professional skills through feedback because CBT is student-centred, self-paced and mastery learning which requires coaching, immediate promptings and repeated reinforcement at regular intervals in the learning process…so I personally make sure I'm always thinking and planning about the next activity that will give more exposure to students."

From the responses, it could be observed that most of the instructors have now tailored their instructional methods to one that is student-oriented and focused.

Introduction and understanding of competency-based training:

Competency-based training is not actually a new phenomenon in training but has been used since the 1960s '70s, and 1980's to improve, vocational instruction in many countries. Presently a number of institutions around the world are now realising the benefits of Competency-based training and its use as a standard for evaluating training programs. It is, however, a new concept in Africa partly explaining why we still rely on expatriates in most major development projects. From this position, the study sought to find out from instructors the introduction and their understanding of competency training. Responses to that effect indicated that instructors possess an appreciable understanding of what competency-based training means. Selected responses have been given below;

"CBT is designed to have a problem-solving attitude which is very important as knowledge is changing and hence problem-solving is more important than knowledge of things. In this training, students are allowed to make mistakes. Students are encouraged to discuss and generate their own ideas for themselves; the learner has the freedom to choose what to learn about, the facilitator guides and provides hints than giving answers to stimulate the problem-solving attitude…"

Another instructor noted;

"…I see it as a form of training that places the main emphasis on what the individual can do, rather than the training itself and it is also concerned with training to industry-specific standards rather than the individual's attainments relative to others…"

"…A teaching approaches where relevant contents of knowledge, skills, attitudes and values, are integrated into a learning module which is connected to real-work situation…"

How is competency-based training carried out in your institution; and in your opinion, how effective is it?

Competency-based instruction and learning activities require capable instructors in knowledge and teaching methodology for its effectiveness. From this standpoint, the interviewed instructors were asked to describe how competency training is carried out in their respective institutions. Selected responses have been outlined below;

"…in this school competencies to be achieved by students are derived from occupational standards and are updated continuously to reflect changing needs..."

Another instructor commented;

"…competencies to be achieved are specific, precise and stated in a written form and are announced in advance for student's awareness…"

"…oh!! We make an effort to create an environment where students are encouraged to undertake collaborative learning by engaging in positive interaction among themselves for active learning.

Another essential point to be considered in the implementation of competency-based TVET instruction is about presentation in the classroom.

"…the thing is that students learn at their own pace, and immediate feedback is provided by the students on their performance on each practice, and this gives me an idea of how my students are progressing on the module."

"…what I do is that I allow my students to practice tasks correctly before moving on to new ones…"

How does competency training in your institution align with industry and occupational standards?
The renewed policy trend of CBT includes more emphasis on skills development of students, responding to the labour market requirements. To achieve this, student skill development is critical to filling industry positions. Based on this assertion the instructors were asked about how competency training in their respective schools align with industry and occupational standards. The responses to that effect are given below;

"...I understand the outlines we are given for the modules are designed in close cooperation with key industry players. This is to ensure that training and competencies are relevant to job requirements..."

"Implementing CBT in our school has brought us closer to the industry. In the context of teaching and learning, this partnership has increased strong linkage between theory and skills, industry-focused curricula, a student-centered, active and exploratory form of learning among trainees making them more suitable for the job market..."

"Hmm!! That is a big issue we expect that, through workplace learning and internship, the industry may assume a direct or an indirect impact on the acquisition of competencies. However, a critical assessment of our module structure tells a different story...am always fighting the authorities we cannot continue like that else we will be producing graduates not competent enough to work in the industry..."

"...we try to create space for industry visitations as well as attachments to ensure that we are on track with the training programs. We also invite industry experts for seminars and workshops to give students the exposure to real-world work scenarios..."

He further added;

"I must confess it has been beneficial as the exchanges have increased skill sets of our students as we have observed tremendous improvements in the performances of students over the years we began this..."

Specific to the pattern making; how does the model influence your instructional practices?
In the garment industry, products are as good as the patterns they are made from. Consequently, competency in pattern making is a major factor in the production of a well-fitting garment. In pattern making, various techniques can be used such as draping, drafting, and reverse engineering.

"Students have to go through four different stages of pattern making before they can get patterns to cut out their garments. First, they develop the basic block pattern which is used as a basis for all adaptations then the secondly the block is traced onto a brown paper to produce the working patterns utilised for marking out the basic style lines as well as the design features. After adding all the necessary structural features to get the desired style of garment the different parts of the garment are traced on the third sheet of paper. This pattern is distinctly marked with the required garment cutting and making up directions comprising all allowances for seams, fullness, herm turnings and pattern symbols. Finally, the patterns are numbered and traced on another piece of drafting paper. It is from this final pattern that the clothing is cut out..."

She further added that;

"...these steps are taken one at a time, and each student is made to master each of these steps at their own pace before they move on to the next stage, and the cycle continues until students are able to demonstrate mastery of the entire process before another concept is introduced."

Another instructor noted

"*My role as an instructor of pattern making has changed to a facilitator; now I no more stand in front of the classroom to deliver my lessons abstractly, rather students learn at their own pace, and immediate feedback is provided for each performance, so incorrect practices are now detected and corrected before they move to the next stage. Learning activities are reinforced until the required competency is achieved."*

Pattern making techniques are critical to the fashion designers concept of creating any garment each of these techniques serve the purpose of creating a style pattern that can be used to construct the designers' concept. It is important to note that without using one of these techniques it is almost impossible for a new fashion design

concept to be made into a wearable garment hence a good pattern maker must learn all these techniques including the various steps otherwise garments cannot be constructed.
It could be observed from the responses that instructor's approach to pattern making has duly changed to accommodate the unique competency requirements necessary for effective teaching and learning of pattern making in the various technical universities. Pattern making is a distinct concept in fashion which demands mastery of the various aspects carefully in order to perfect competencies.

How do you assess your students going through competency training?
Assessment is the process of measuring the learner's skills, knowledge and understanding of the standards laid down for a particular unit. If a learner can show by generating sufficient evidence of their competence that they meet the standards, then they qualify for that unit. Therefore, CBT assessment measures whether a learner is competent or not and only two possible outcomes can be the result of the assessment process. That is if they are competent then they can perform what is stated in the standard; on the contrary, if they are not yet competent, then it means they cannot perform yet what is stated in the standard. From these background instructors were asked to describe how they assess their students; the ensuing are some of their responses;

"...I usually assess my students by placing emphasis on their performance, and I do that either by observing them while they carry out the activity or by looking at what the learner has made or done."

Another added that;

"...By asking the learner questions that can be answered either verbally or writing."
"In assessing my students for mastery of concepts they only have to prove they can do a task, activity or exercise well enough to be assessed as competent."
"Students have to be successful in the task they are given to complete that unit of work."

Students' assessment of competency-based training is based on learning outcomes specified in the learning unit specifications developed for each course. Therefore, in competency-based training, assessment refers to collecting evidence of a learner's performance. It is on the performance that the assessor determines whether or not or the extent to which a learner has met the performance of judgement is made as to whether a learner has achieved a learning outcome as a whole or not.

Is there the need to strengthen the link between TVET institutions and the Industry?
Collaborating with the industry and TVET institutions are a major rising concern in many developing countries like Ghana. For the improvement of TVET systems, there is a need to forge closer links with training and the labour market. Adequate collaboration between these two will lead to the provision of relevant practical skills for industrialisation.

"...Yes, we need to do more because the industry is the primary consumer of graduates. Therefore, industry participation in the curriculum and workplace training opportunities is the primary way of achieving this. If employers are not involved in the process of imparting the specific skills, attitudes and behaviours required by graduates they are less likely to see any relevance to the institutions and their skill needs."
"...Yes and I think with TVET education the curriculum is relatively stable hence constant feedback from the industry is the only primary input to updating curriculum along with graduate input on the relevance of student's acquired skills, and the performance industry requires...."
"In most emerging economies like Ghana, educators and industry operates in different worlds and often has little contact with each other, so that is what we are facing there's little involvement of industry in our activities in this school. So yes, we need to strengthen our ties with industry to get students exposed to the real-world situation ahead of time..."

From the responses, it could be gathered that on the whole, the technical universities instructors accept that the technical universities need to engage more of key industry players to augment the efforts of the instructors. These exchanges will help students better have foreknowledge of the trends and demands of the working environment.

What challenges do you face in teaching your course using the competency-based training models?
Challenges identified in the implementation of competency models are many and varied among TVET institutions. These include inadequate training materials and equipment, increased workload, insufficient learning support from lecturers, learners' difficulty in studying on their own due probably to the paradigm shift of the role of the teacher.

"…the cutting of pattern for a clothing only can take an average of 12 hours that is four lecture periods which is very difficult, so then you have to schedule lessons in between others, and that breaks the continuity of thought…"

"…my only challenge is the calibre of students admitted. Some of them are slow so one very thing you have to keep repeating over and over again…and even with that they go and come back virtually with the same mistake…moreover, sometimes it is very frustrating."

"…with time the nature of tools and equipment that is currently available in the schools is woefully inadequate. The few that are available are obsolete and fall far behind the kind of equipment used currently in industries. The kind of classrooms used by TVET students is inappropriate. The kind of workshops available for TVET lacks the space required to teach practical lessons. Broken down machines and tools have been left unrepaired for several years. Due to lack of conducive classrooms for teaching and learning, we have converted our workshops to classrooms."

"The problem I have is that with the implementation of a competency-based curriculum in this school we still have problems regarding training materials in implementing the competency-based models. ...for instance, materials like brown paper, greybaft, dress forms and calico. Initially, I used to buy brown paper from my own pocket for students to use. But after some time I made the student buy themselves for their own work..."

She added that;

"…like I was saying these materials are meant for training, but they are not provided on time, they mostly come around May after the training program is completed. Competency-based TVET training is practical in nature, and in fact, 70% is practical and 30% theoretical but in our case the reverse is true..."

Another instructor highlighted;

"We have serious infrastructural challenges, you can just look around, we have metalwork, fashion and design, building and construction, woodwork, electricals, and we have auto mechanics. Out of these, it is only woodwork and metalwork that has well-equipped workshops. So, in terms of infrastructure, we have serious problems, not even a proper equipped fashion lab…"

One other instructor elaborated as follows;

"Tools and equipment available are out of date, unserviceable or inaccessible the labs and workshops are poorly equipped with antiquated tools and machinery many of which are non-functional can you imagine some old hand sewing machine this whole institution. Even individuals are buying industrial machines for their works."

The responses show that generally, TVET education in the various technical universities is facing various challenges that are preventing it from making the desired impacts as expected. From the results, it could be concluded that most, the technical universities are challenged by infrastructural inefficiencies to facilitate the implementation of the competency models.

Is the quality of TVET being addressed by the way competency models are being implemented in your institution?

In TVET, quality is directly related to the achievement of learning outcomes such as knowledge, skills and competencies achieved at the end of the learning process and this must fulfil key stakeholder expectations. From this background, the instructors were asked whether the implementation of competency-based training in their respective schools is addressing quality issues in TVET.

"Quality in TVET depends on several inseparable components because the quality of learning outcomes is multi-dimensional and the emphasis is placed on all the components to produce the desired outcomes."

"In our institution, there is a quality assurance department in place that helps people to have confidence in the quality of our programs and these increases public trust."

How can competency training in your institution be improved?

Given the growing importance of CBT with its associated challenges in preparing students for work, there is little reason to limit access or to discourage improvements in the general outlook of CBT in Ghana. The CBT

system requires more efforts to significantly improve quality and outcomes to attract better student's outcomes. From this notion, instructors were asked to suggest ways that the implementation of competency-based training can be improved in their respective institutions. Below are selected responses;

"Hmm! On the whole, there is the need for massive infrastructural development through the provision of proper tools and equipment to be used in vocational training…and also incentives should be offered to encourage the private sector to collaborate with the technical and vocational institutions to train the teachers according to the labour market orientation…"

"For me you see I take things from the foundation; on this one, the understanding and knowledge of instructors about CBT is central to a successful implementation of CBT in the technical universities. That is why I believe that consistent provision of in-service training to instructors. Since instructors are the major implementers of the modules. This will allow instructors to play their roles effectively..."

SUMMARY OF FINDINGS:

On the adoption of competency-based models to teaching, it can be concluded from the interviews that instructors adopt different roles and responsibilities to augment student learning. Most of the instructors have now tailored their instructional methods to one that is student-oriented and focused. In relation to how CBT is carried out, it can be concluded that competencies to be achieved by students are derived from occupational standards and are updated continuously to reflect changing needs. Concerning how the model influences instructional practices specific to pattern making, it can be concluded that instructor's approach to pattern making has duly changed to accommodate the unique competency requirements necessary for effective teaching and learning of pattern making in the various technical universities. Pattern making is a distinct concept in fashion which demands mastery of the various aspects carefully in order to perfect competencies.

On students' assessment of competency-based training, an appraisal is based on learning outcomes specified in the learning unit specifications developed for each course. Therefore, in competency-based training, assessment refers to collecting evidence of a learner's performance on which an assessor determines whether or not or the extent to which a learner has met the performance requirements of the learning outcome laid in a particular unit. Then a decision is made based on this judgement as to whether a learner has achieved a learning outcome as a whole or not. From the findings, it can be concluded that generally, TVET education in the various technical universities is facing various challenges that are preventing it from making the desired impacts as expected. Mostly, the technical universities are challenged by infrastructural inefficiencies to facilitate the implementation of the competency models.

RECOMMENDATIONS:

There is an urgent need to enhance pedagogical training to the distinctive nature of TVET by recognizing authentic teaching and learning whereby real industry working environment can be replicated in a school setting or by affording more opportunities to collaborate and utilize the workplace as a learning station. Using competency models and incorporating project and problem-based training are timely momentarily as the demand from industry for specialized skills and employable skills are becoming more apparent and stringent. The adoption of vocational pedagogy copulated with the use of technology is worth exploring.

CONCLUSIONS:

Lack of skills that are valued in local and global economies constrains economic growth. Demand-driven TVET is potentially one of the most valuable tools for giving skills to the youth, both in and out of school. However, TVET looks very different in developed nations as compared to the developing ones. However, the concept of competency models in TVET training puts more emphasis on the importance of the entire competence of individuals and especially on their ability to solve problems. The concept of competency models in TVET is an industry and demand driven education and training program based on well-defined industry-generated standards based on occupational competencies which are established for each career field and each job title.

Furthermore, competency training models in TVET institutions, emphasises the outcome students demonstrate after their training period and focuses on practical training in ensuring that students acquire the necessary competencies and skills; in this case, the apparel pattern making processes. It begins with a clear identification of competencies and expertise students need to master and state clearly the criteria and conditions by which performance are assessed which are made available to the students in advance. Competency models may be new to some technical universities; however, the concept and approach have been accepted worldwide in industries

and many training organisations. The quality of TVET instructors influences the performance of vocational students directly. It is, consequently, imperative to develop a model of pedagogical competence of apparel pattern making instructors in this world of sustainable development to contribute to strengthening sustainable vocational education and training system in Ghana.

A competency-based TVET system uses combinations of dominant techniques to ensure that the needs of different industry sectors such as the fashion industry are addressed. In many countries including Ghana, nevertheless, most skills gained during TVET training are too narrow in scope, lack overall context and misses the demand of the labour market. The present study aimed at determining the level of TVET instructors' competency in apparel pattern making processes in selected technical universities offering the fashion design program in Ghana. It is hoped that the study will impact significantly on competencies acquired by learners in apparel pattern making processes for the fashion industry.

REFERENCES:

ADB, (2010). Labor Market Assessment: Strengthening Technical and Vocational Education and Training Project. http://www2.adb.org/Documents/RRPs/LAO/42278/42278-02-lao-oth-01.pdf

Aldrich, W. (2013). *Metric Pattern Cutting for Women's Wear* (5th edn.) London: Wiley Ltd.

Allen Consulting Group (2006). Assessment and reporting of employability skills in training packages, Department of Education, Science and Training, Melbourne.

Amaden-Crawford, C. (2012). *The art of fashion draping,* (4th edn.) NY: Fairchild Publication.

Ashton, D., Green, F., James, D. & Sung, J. (1999). *Education and Training for Development: The Political Economy of Skill Formation in East Asian Newly Industrialised Economies*. London: Routledge.

Badawi, A. A. (2013). *TVET and entrepreneurship skills. In revisiting global trends in TVET: Reflections on theory and practice.* UNESCO - UNEVOC International Centre for Technical and Vocational Education and Training.

Bosch, G., & Charest, J. (Eds.). (2009). *Vocational training: international perspectives*. New York: Routledge.

Brockmann, M., & Winch, C. (2011). *Knowledge skills and competence in the European Labour Marke*t. London: Routledge.

Brown, M., (1994). *A Collection of Readings Related to Competency Based Training*. Victoria: Deakam University.

Cedefop. (2015). *Handbook for VET providers: Supporting internal quality management and quality culture*. Cedefop reference Series 99. Luxembourg, Publications Office of the European Union.

Education Growth Advisors (2013). Learning to Adapt. http://edgrowthadvisors.com/wp-content/uploads/2013/03/Learning-to-Adapt-White-Paper_Education-GrowthAdvisors_March-2013.pdf

Education International. (2015). UNESCO adopts international standards to promote adult and vocational education. Geneva. https://www.ei-ie.org/en/news/news_details/3802 viewed 20 August 2016.

EDUCAUSE Learning Initiative (ELI), A Working Definition of Personalized Learning. http://net.educause.edu/ir/library/pdf/csd6272.pdf

Everhart, D. Sandeen, C., Seymour, D. & Yoshino, K. (2014). *Clarifying Competency-based Education Terms: A Lexicon*. The American Council on Education and Blackboard.

Fischer, A. (2009). *Basics: Fashion Design Construction*. Switzerland: AVA Publishing.

Gallacher, J., Ingram, R., & Reeve, F. (2012). *Are vocational qualifications vocational*? In Matthias Pilz (editor) The future of vocational education and training in a changing world (pages 381-402), Wiesbaden: Springer VS.

Gamble, J. (2013). *Why improved formal teaching and learning are important in technical and vocational education and training (TVET)*. In UNESCO-UNEVOC (Ed.), Revisiting global trends in TVET: Reflections on theory and practice (pp. 89 - 122). Bonn: UNESCO-UNEVOC International Centre for Technical and Vocational Education and Training.

Gentles, S. J., Charles, C., Ploeg, J., & McKibbon, K. A. (2015). Sampling in qualitative research: Insights from an overview of the methods literature. *The Qualitative Report*, 20(11), 1772-1789.

Green, A., Hodgson, A. & Sakamoto, A. (2000). *Financing Vocational Education and Training*. In Descy, P. and Tessaring, M. (eds.) *Training in Europe. Second report on vocational training research in Europe 2000*: Volume 1, Cedefop Reference series. Luxembourg: Office for Official Publications of the European Communities.

Grollmann, P. & Rauner, F. (2007). *TVET teachers: an endangered species or professional innovation agents*? In Philipp Grollmann and Felix Rauner (editors), International perspectives on teachers and lecturers in

technical and vocational education pages 1–26, Dordrecht: Springer.
Grootings, P. & Nielsen, Sören (Eds.) (2006). *Skills development for poverty reduction*. ETF Yearbook 2006. Turin: European Training Foundation.
Guest, G. Namey, E. E. & Mitchell, M. L. (2013). *Collecting Qualitative Data. A Field Manual for Applied Research*. Thousand Oaks, CA: Sage Publications.
Guthrie, H. (2009). *Competence and competency-based training: What the literature says*. Adelaide: National Centre for Vocational Education Research.
Helix Education (2014). *Instructional methods and Education models shaping the Future of higher education: Defining and Differentiating Personalized Learning, Adaptive Learning, and Competency – Based Education*. Helix Education White Paper.
Hesse – Biber, S. N., & Leavy, P. (2011). *The Practice of Qualitative Research*. (2nd edn.). Thousand Oaks, CA: SAGE Publications.
ILO (International Labour Organization) (2010). Teachers and trainers for the future – technical and vocational education and training in a changing world. *Report for discussion at the global dialogue forum on Vocational Education and Training* (29–30 September 2010), Geneva, ILO.
ILO (International Labour Organization) (2015). Voc*ational teachers and trainers in a changing world: the imperative of high-quality teacher training systems*. Geneva.
Jonnaert. P., Masciotra, D., Barrette, J., Morel D. & Yaya, M. (2006). *Revisiting the Concept of Competence as an Organizing Principle for Programs of Study: from competences to competent action* (original in French). IBE Working Paper on Curriculum Issues (online). Geneva: IBE/UNESCO.
Joseph Armstrong, H. (2010). *Patternmaking for Fashion Design.* N. J.: Pearson Education Inc.
Kahn, A., Cohen, P. & Soto, D. (2005). Pre – Assembly Processes-The Cutting Room Marking, Spreading, Cutting and Bundling. pp. 1-32.
Keep, E. (2015). Thinking about where to go and what next to do in the reform of vocational qualifications. *Journal of Education and Work*, 28(2), 117-125.
Kim, S. M., & Kang, T. J. (2003). Garment pattern generation from body scan data. *Computer-Aided Design*, 35(7), 611-618.
Kim, S., & Park, C. K. (2007). Basic garment pattern generation using geometric modelling method. *International Journal of Clothing Science and Technology*, 19(1), 7-17.
Leavy, P. (2017). *Research Design: Quantitative, Qualitative, Mixed Methods, Arts-Based, and Community-Based Participatory Research Approaches*. Guilford Press.
Lemma, D. (2017). Effectiveness of competency-based TVET curriculum in TVET institutions of Oromia Regional State. *The Ethiopian Journal of Science and Sustainable Development*, 6(1), 100-112.
MacDonald, N. M. (2010). *Principles of Flat – Pattern Design* (4th edn.) NY: Fairchild Books.
Marope, P. T. M., Chakroun, B., & Holmes, K. P. (2015). U*nleashing the potential transforming technical and vocational education and training*. Paris: UNESCO Publishing.
Maxwell, J. A., (2013). *Qualitative Research Design: An Interactive Approach*. (3rd Edn). Thousand Oaks: Sage Publications.
Mbarushimana, N. & Kuboja, J. M (2016). A paradigm shift towards competence-based curriculum: The Experience of Rwanda. *Journal of Business and Management Studies* 1(1), 6-17.
McClarty, K. L., & Gaertner, M. N. (2015). *Measuring mastery: Best practices for assessment in competency-based education*. Washington, DC: Center for College & Career Success, Pearson.
McKinney, E. C. (2007). Towards a three-dimensional theory of pattern drafting: Relationship of body measurements and shapes to pattern measurements and shapes (Doctoral dissertation, University of Minnesota).
Meng, Y., Mok, P.Y., & Jin, X. (2012). Computer aided clothing pattern design with 3D editing and pattern alteration. *Computer-Aided Design*, 44, 721-734.
Meyer-Adams, N., Potts, M. K., Koob, J. J., Dorsey, C. J., & Rosales, A. M. (2011). How to tackle the shift of educational assessment form learning outcomes to competencies: One program's transition? *Journal of Social Work Education*, 47, 489–507.
NCVER (1999). *Competency-based training in Australia: Research at a glance,* Adelaide: NCVER.
NCVER (National Centre for Vocational Education Research) (2003). *Fostering generic skills in VET programs and workplaces: At a glance*. Adelaide: NCVER.
Obwoge, E. M. (2016). Competency – Based Education and Training: A Fresh Green Leaf from the Australian Context for TVET in Africa. *IRA International Journal of Education and Multidisciplinary Studies,*

3(3), 538-545.
Oppong, S. H. (2013). The problem of sampling in qualitative research. *Asian journal of management sciences and education,* 1-9.
Pahl, J.P. & Rauner, F. (2009*). Research in the vocational disciplines*, in Rauner, F. & MacLean, R. (ed) Handbook of technical and vocational education and training research, pages 193-199, Springer.
Patton, M. Q. (2015). *Qualitative research & evaluation methods: Integrating theory and practice* (4th edn.). Thousand Oaks, CA: Sage.
Powell, L., & McGrath, S. (2014). *Exploring the Value of the Capability Approach for Vocational Education and Training Evaluation: Reflections from South Africa*. In G. Carbonnier, M. Carton & K. King (Eds.), Education, learning, training: critical issues for development. Leiden; Boston: Brill Nijhoff.
Raimi, L., & Akhuemonkhan, I. A. (2014). Has Technical Vocational Education and Training (TVET) impacted on Employability and National Development? *A multidisciplinary journal of global macro trends*. *The Macro Theme Review*, 3(2), 12-19.
Santioanni, P. (2016). Teaching and learning in competency-based education courses and programs: Faculty and student perspectives. *The Journal of Competency - based education*, 1(1), 42–47.
Schofield, K & McDonald, R. (2004). *Moving on: Report of the high-level review of training packages.* Melbourne: Australian National Training Authority.
Soares, L. (2012). A 'Disruptive' Look at Competency-Based Education: How the Innovative use of Technology will Transform the College Experience. Centre for American Progress.
Tikly, L. (2013). *Reconceptualizing TVET and development: a human capability and social justice approach*. In UNESCO (Ed.), Revisiting global trends in TVET: Reflections on theory and practice (pp. 1-39). Bonn: UNESCO-UNEVOC.
Torres, A. S., Brett, J., & Cox, J. (2015). *Competency-based learning: Definitions, policies, and implementation*. Waltham, MA: REL Northeast and Islands at EDC.
Tripney, J., Hombrados, J., Newman, M., Hovish, K., Brown, C., Steinka-Fry, K., and Wilkey, E (2013). *Post-basic technical and vocational education and training (TVET) interventions to improve the employability and employment of young people in low- and middle-income countries: A systematic review.* Campbell Systematic Reviews.
UNESCO (2015) *Recommendation concerning Technical and Vocational Education and Training*. Paris.
UNESCO. (2015). Unleashing the Potential: Transforming Technical and Vocational Education and Training. Paris, UNESCO. http://unesdoc.unesco.org/images/0023/002330/ 233030 e.pdf
UNESCO. (2017). *Towards Quality Assurance of Technical and Vocational Education and Training: Trends and Challenges in the Asia-Pacific Region*. Bangkok, UNESCO.
Verdier, E. (2013). *Lifelong learning regimes versus vocational education and training systems in Europe: The growing hybridisation of national models*. In J. G. Janmaat, M. Duru-Bellat, A. Green & P. Méhaut (Eds.), The Dynamics and Social Outcomes of Education Systems (pp. 70 - 93). Hampshire: Palgrave Macmillan.
Wahba, M. (2012). Competence Standards for Technical and Vocational Education and Training TVET. Available at: http://cva-acfp.org/article/competence-standards-for-technical-and-vocational-education-and-training-tvet/
Wheelahan, L. (2012). *The problem with Competency Based Training.* In H. Lauder, M. Young, H. Daniels, M. Balarin & J. Lowe (Eds.), Educating for the Knowledge Economy? Critical perspectives (pp. 152-166). London: Routledge.
Wheelahan, L., & Moodie, G. (2011). Rethinking skills in vocational education and training: from competencies to capabilities. Sydney: Board of Vocational Education and Training.
Winch, C. (2013). *The attractiveness of TVET*. In UNESCO-UNEVOC (Ed.), Revisiting global trends in TVET: Reflections on theory and practice (pp. 89 - 122). Bonn: UNESCO-UNEVOC International Centre for Technical and Vocational Education and Training.
Wolf, A. (2011). *Review of Vocational Education - The Wolf Report*. London: Department for Education, England.
