

DESIGN OF LEARNING DELIVERY STRATEGY BASED ON DIMENSIONS OF COMPETENCY IN VOCATIONAL EDUCATION AND TRAINING

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Abstract

This study identified the use of dimensions of competency model to facilitate learning and improving performance by managing processes and resources. This study uses a Case Study research approach. The result of this study identified that by managing delivery order process follow the order of five dimension of competency can facilitate learning and improving performance of learning. The order of learning delivery are: Task skills (performing individual tasks); task management skills (managing a range of different tasks); Contingency management skills (responding to contingencies or breakdowns), job/roles management skills (dealing with the responsibilities of the workplace), and transfer skills (work with new specifications and others). The limitation of this study lies on its scope of Technical Vocational Education and Training (TVET). The result may not be applicable in non-vocational education. With the Five dimension of competency model of learning delivery This model can be used to enhance and improve the delivery model based on percentage of delivery portion times policy practical and theory.

Index Terms—*learning delivery strategy, dimension of competency, vocational education, competence.*

I. INTRODUCTION

Issues of non-employable vocational education and training arising from complaints from industry or workplace complaints at the time of recruitment, in fact many graduates from vocational education and training were not yet employable, this resulted in unemployment occurring in vocational education graduates who were should be the opposite (Figure 1). This problem is an ongoing challenge that is a common theme: that business leaders want to see the value of their human resource investments; that they want people's initial reactions to learning experiences to show that learning is relevant and directly applies to their needs; and they want to see the effectiveness of learning and its sustainability [1].

The effectiveness and quality of vocational education and training remains a major challenge and problem for Indonesia. Workers' skills are very important for company productivity and competitiveness, as well as the work abilities of the workers themselves. The government and society have made a lot of efforts to improve the link and match system of education and training, so as to ensure the skills possessed by workers meet the needs in the workplace. This phenomenon shows the ineffectiveness of learning implementation. Pauline Kneale in Fry et al identified that graduates generally would be more effective at work and make a greater impact on their careers if deep lifelong and instructional learning skills were part of their practice [2].

Efforts to improve the effectiveness of the delivery of learning very much, including by dividing the percentage between theory and practice (40:60, 30:70 etc.). However, the way of delivery that starts by giving the theory to completion and then followed by practice can result in participants forgetting the theory at the time of practice, so that students do not achieve the expected learning effectiveness, even at risk of only achieving task skills.

Learn the problem of learning effectiveness, it is important to develop students' thinking and learning abilities. Specifically “Reference [3] identifies the modern systems thinking principles are: The big picture; Long term, short term perspectives; Measurable and no measurable data; Dynamic, complex and interdependent; and We are a part of system. He also promote a linear thinking which is a process of thought following known cycles or step-by-step progression where a response to a step must be elicited before another step is taken”. Therefore learning delivery strategies is very important to improve the effectiveness of learning is a learning delivery system based on the management of competency dimensions.



Figure 1. Open Unemployment Rate by Highest Education Level Graduated (percent), August 2016 – August 2017 [4].

This study aims to answer the following questions:

- How can training effectiveness be improved?
- How can the delivery strategy intervene and improve the quality and performance of vocational education and training?

II. METHODS

a. Theoretical basis

i. Competency and competence

In Indonesia these two words are generally the same (in a dictionary) but, in their conception, they make a difference in the competency development approach used in vocational education and the workplace. This if not understood in depth can lead to the term dichotomy in education and the workplace which can further lead to miss and unmatched between the competencies of the area of education and the workplace.

“Reference [5] identified 'competence' as generally referring to functional areas while 'competency' for behavioral areas but their use was often inconsistent”. Competence approach as a functional area is widely used by industry, especially by practitioners of human resource development in the industry. So when the British government realized the endemic of not achieving skills in schools

in the UK, the government in 1980 introduced a competency-based approach (vocational-based approach) for vocational education to reform and build a national-standard system of work-based qualifications (work-based qualification) [5]. This vocational education reform was driven by the application of a competency-based qualification framework, which then influenced similar developments in other countries in the Commonwealth and the European Union.

ii. Standard of Competency

Competency standards describe the knowledge, skills and attitudes needed to perform in a particular occupation. Competency includes all aspects of the work including [6]: skills to perform all the different tasks of the job; managing a range of different task and activities required by the job; responding to problems, the unexpected and non-routine events; and dealing with all aspects of the workplace, the organisation and colleagues

"References [7] identify that competency standards support a variety of jobs. Competency standards have been developed with a good format and process and standards ". So that the competency standards produced can be used by countries that are in the process of developing their national standards, or are reviewing national standards that support TVET (Technical Vocational Education and Training). In addition, competency standards have been able to encourage collaboration between technical experts and practitioners and activities to increase capacity, promote internal industry cooperation and the public-private sector, develop workers' quality and skills, and lifelong learning. This is because the expert groups formed to build competency standards must represent this sector. Once developed, competency standards are validated by the industry. This enables competency standards to be appropriate for these objectives.

This enables competency standards to be appropriate for these objectives. The main purpose of competency standards is as an assessment instrument. In addition to these objectives, there are several other important objectives, namely: as a source of information in designing curriculum; a tool for equality of national and international qualification benchmarks; recognize someone's skills; and planning career paths [7].

The main aim of national competency standards is to identify the nature of the work performed in correctional services and the standards required by workers to be deemed competent. This provides the basis for the design of training and detailed specifications for workplace assessment. It also provides the basis for national industry qualifications. "Reference [8] identify that in higher education, specifically, the development of technology has been improving its assessments system. Instead of examination, assessment system become significant for educational practices, and it should be implemented considerably in schools, through teaching-learning process, tiered and sustainable from basic education to higher education".

The competency standards should not be confused with curriculum. Curriculum can be used to translate the standards into a wide range of learning outcomes and processes which lead to the performance outcomes described in the standards. Competency standards also should not be confused with practice standards or service standards. Competency standards are limited to the work actually performed and demonstrated by the workers. However, competency standards will provide a valuable ingredient in performance management and quality endorsement [6].

In designing training programs it is often based on competency standards. But it should be done

after the training needs analysis process. Competency standards are used as minimum standards in curriculum design, because standards are only a critical aspect requirement as an indicator of competence in the curriculum; and does not cover the education and training needs of students holistically [7].

iii. Dimension of Competency (DoC)

The concept of competency covers the five dimensions of: Task skills – carrying out individual tasks; Task management skills – dealing with several tasks at the same time; Contingency management skills – dealing with things when they go wrong; Job/role environment skills – fitting in with the workplace environment; dan Transfer skills – being able to transfer skills to new situations [9]. While “Reference [10] identified that the competency dimension is part of the concept of the magnitude of competency, which covers all aspects of performance represented as four dimensions namely task skills, task management skills, contingency management skills and job / role environment skills”.

Some experts use the term transfer skill and some use the term transferable skills. Transfer skills are defined as the ability to overcome problems in a different context. While Transferable is defined as transferring skills and knowledge to new situations and contexts. But in their use these two terms are used interchangeable. Both require the ability to adapt to different work situations and demands.

Besides that, some experts identified the competency dimension to include transfer skills so that they became five dimensions, while some other experts did not include skill transfer in the competency dimension, but instead became key competency or employability skills. However, both groups identified as a very important skill to produce new innovations.

b. Method

This study is a qualitative study using a Case Study research approach. The methodology of case study research derives primarily from ethnography, which is one of the earliest forms of qualitative research [11]. There are four key characteristics of a qualitative research in this case study, i.e.:

- **Study of Particular Instances of a Phenomenon.** The case study explains a particular phenomenon - that is, a series of processes, events, individuals, programs, or other events or situations that are of interest to the researcher
- **In-Depth Study of the Case.** A case study involves in-depth study of the phenomenon, meaning that a substantial amount of data are collected about the specific case or cases selected to represent the phenomenon.
- **Study of a Phenomenon in Its Natural Context.** This approach to research typically involves **fieldwork**, a process in which researcher interact with participants in the field, meaning in their natural settings rather than in a setting established primarily for research purposes.
- **Representation of Both the Emic and Etic Perspectives.** This case study came to understand a phenomenon from the research participants’ point of view (emic perspective) while also maintaining their own point of view (etic perspective).

III. RESULTS AND DISCUSSION

Discussing the competency dimensions in vocational education and training, we cannot be separated

from Competency-Based Education, Outcome-Based Education and Competency-Based Assessments. This is because the benchmarks of the graduate profile and assessment pattern will cover the dimension of competency. “Reference [12] identified that in competency based education (CBE):

- Students are empowered daily to make important decisions about their learning experiences, how they will create and apply knowledge, and how they will demonstrate their learning.
- Assessment is a meaningful, positive, and empowering learning experience for students that yields timely, relevant, and actionable evidence.
- Students receive timely, differentiated support based on their individual learning needs.
- Students progress based on evidence of mastery, not seat time.
- Students learn actively using different pathways and varied pacing.
- Strategies to ensure equity for all students are embedded in the culture, structure, and pedagogy of schools and education systems.
- Rigorous, common expectations for learning (knowledge, skills, and dispositions) are explicit, transparent, measurable, and transferable.

Reference [13] identify that Outcome Based Education (OBE) is a theory of educational that base on that every part of the education system is part of the goal. At the end of the educational experience, each student must reach the goal. There is no single teaching or assessment style in OBE; instead, classes, opportunities, and assessments must all help students achieve the specified results.

Whereas “Reference [14] defines Competency-based assessment is a form of assessment that is derived from a specification of a set of outcomes; that so clearly states both the outcomes-general and specific-that assessors, students and interested third parties can all make reasonably objective judgements with respect to student achievement or non-achievement of these outcomes; and that certifies student progress on the basis of demonstrated achievement of these outcomes. Assessments are not tied to time served in formal educational settings.

The three models base the benchmarks of evidence of learning achievement, and the evidence for the assessment is standard based and evidence based as well as participatory. So as to prove competence is not tested learning outcomes but assessed formatively and if it is not achieved then the recommendation is at least two choices, namely returning to class or adding hours of practice to add experience.

a. Task skills

From discussions in theoretical foundations, task skills require task performance to the required standards as described in the competency unit and expected in the workplace. So assessors need to gather evidence that students can take individual actions and all tasks [10]. The identified skill task is also a specific step of performance which must be carried out according to acceptable industry standards. For example in making cakes, the task skill for individuals is to complete all the steps needed to make cakes according to standards.

To ensure that learners follow the tasks according to standards, we have to help participants / students, the following steps: Understanding the concepts and principles of the task; internalization according to competency standards applied in the industry (conceptions and principles and theories), and how SOPs are in accordance with customer requirements, standards and regulations; follow step by step standard operational procedures; doing repeatedly until reaching the required

standard level and until feeling confident to carry out their duties; and conduct independent assessments to ensure achievement of their competencies.

In the delivery of learning “Reference [1] provides successive models of Reaction, Learning, Behavior, and Outcomes. Then study them back and forth, namely: Results, Behavior, Learning, Reaction. So that every time we face a client, then we can ask the same question, repeatedly. What results do you want? What to do? What competencies or assets do we need? How can we arrange our solutions so that people will react positively to them?”

b. Task Management Skills

These skills integrate a number of potentially different tasks to achieve complete work results. Within the framework of qualifications and occupational packaging, the skills that must be managed can be identified from core competencies. Here, Reference [11] stipulates that participants must show evidence that they can demonstrate their work efficiently to productively handle and manage tasks interrelated smoothly. In more simple words that skilled participants deal with several tasks simultaneously. This is because, “Reference [15] further emphasized, that the education system, especially in vocational education, is composed of context components. input, process, output and outcome. context influences input, input influences process, process influences output and output influences outcome”

The method of presenting learning task management skills is to help and facilitate participants / students, by: explaining what is placed as real work, the role of a person would be more than one task; identify the main core tasks of the job function / task at the work place established by the company, or can be in accordance with the description of the occupation at the time of certification. So, task management skills refer to the ability to manage a number of tasks correctly that are part of real work. This involves the ability to integrate a number of different tasks to achieve complete work, example: follow health and safety procedures when baking such as cleanliness, ensure that relevant tools, tools and equipment are available and functional.

Here participants must be able to ensure that all tasks can be completed competently, with the attributes: have a positive attitude, make plans, manage effectively, understand the interaction of a number of skills with your perfection, focus on the task at hand, get things done every day. At this stage, participants can be sure not to forget the skills of the tasks learned previously.

c. Contingency Management Skills

This skill is a requirement for responding to irregularities and disturbances in routine, where candidates must show evidence of dealing with possibilities, for example: disturbances, irregularities, imperfections or unknowns [11]. This skill helps participants respond appropriately to deviations and problems in routine activities at work / work place. As employees at work, there are times when unexpected situations occur and alternative equipment or tools must be used to complete tasks. Therefore, it is important that every time you plan an activity, you must always plan for emergencies or unexpected situations. This is important because it prevents loss of time and resources. Examples of Contingency Management Skills are, What if ...? Equipment is broken - if the electric mixer stops working then the solution can be to use an alternative mixer or apply hand mixing techniques with the equipment needed; The temperature is too high before baking - the solution is to reset the temperature and let the oven cool down to the required temperature setting

How to present learning contingency management skills is by helping and facilitating participant / student, to: Identify problems both experienced by the workplace, as well as other sources of information (textbooks, journals, report documents and others); provide interventions in the form of irregularity or damage and how to respond to resolve the problem; alternative identification addresses each problem; and practice overcoming and managing problems until reaching mastery. At this stage in general the trained participants will feel happy and will not forget the task skills or task management skills, and will feel proud.

d. Job/Role Environment Skills

These skills are a requirement for dealing with the responsibilities and expectations of the work environment, the capacity to work with others and adapt to different situations is central to successful performance including adapting to the work environment [11].

These skills identify generic competencies that support the job. Basically work environment / role skills or work skills reflect the requirements of work attitude. They discuss a person's ability to handle or handle the responsibilities and expectations of the work environment. This may include working with others, communicating effectively and resolving problems that might arise. Many workplace requirements are formulated in the code of practice or guidelines for workplace requirements, such as Good Manufacturing Practices (GMP), Good Laboratory Practices (GLP), Good Farming Practices (GFP), and others.

How to present job learning / role environment skills in learning is by helping and facilitating participant/student, for: Identification of work environment requirements from the workplace, other sources of information (textbooks, journals, report documents and others); work following SOPs and communicate with colleagues; and others.

At this stage, in general, students will feel happy and will not forget the task skills, task management skills, contingency management skills and will feel proud. "Reference [16] found that certain conditions someone can force themselves to do something unfamiliar".

e. Transfer skills

This skill is the ability to transfer / adapt skills to new situations, new standards, or new requirements, also known as "transferable skills" or "portable skills," which are qualities that can be transferred from one job to another. Someone may already have many transferable skills that employers want, such as strong organization or communication, or as the ability to solve problems in new contexts.

These skills can help convince potential employers that someone is very suitable for their company, even someone who has no experience, transferring these skills can adapt to new jobs and in any situation.

The learning delivery for job / role environment skills is by helping and facilitating participant / student, to: provide context in learning in the form of new context, new specifications, new requirements; focus on the relevance of what you're learning; take time to reflect and self-explain; use a variety of media learning; change things up as often as possible; identify any gaps in their knowledge; establish clear learning goals; practice generalizing, and others.

In this dimension of transfer skills, someone with transfer skills usually brings benefits to prospective workers and employers [17]:

- **Flexibility.** In an increasingly competitive job market, these skills provide the ability to complete the vary tasks and roles.
- **Diversity.** Transfer skills will increase the many variations that can be offered to prospective employers.
- **Portability.** The nature of this transfer skill can be brought with someone when they change jobs.
- **Work ability.** With this transfer of skills if someone has little work experience, then one can adapt to new demands.

f. Implementation trial of the competency dimensions for learning module development

The implementation trial of the competency dimension involved the writers of the learning modules consisting of 44 Master Trainer, Lecture, Master Assessor, Non Fiction book writer, IT Professional. The trial was conducted with the preparation of learning modules that produced 72 modules followed by FGD (Focus Group Discussion). From the results of the trial and FGD, a survey based on the number 5 hedonic scale with the results as below.

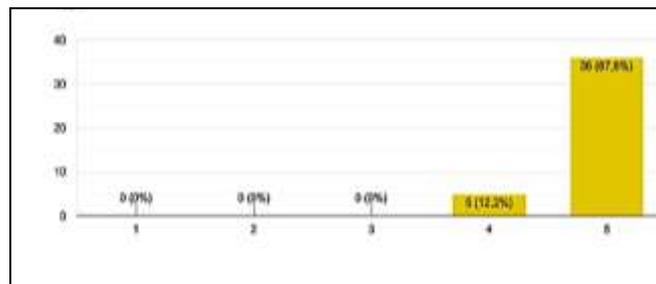


Figure 2. The learning module writer who is interested in applying the five dimensions of competency (41 responders on a 5-point hedonic scale).

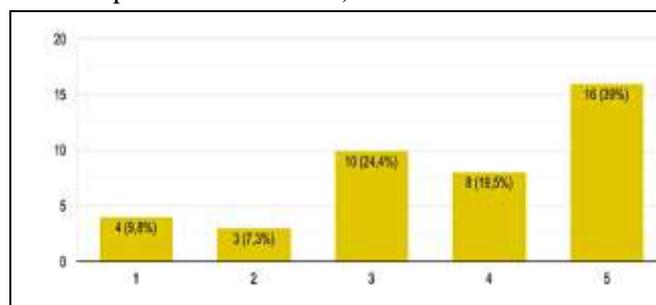


Figure 3. Composition of module writers who used the competency dimension before participating in the FGD for the Development of Learning Modules (41 responders on a 5-point hedonic scale).

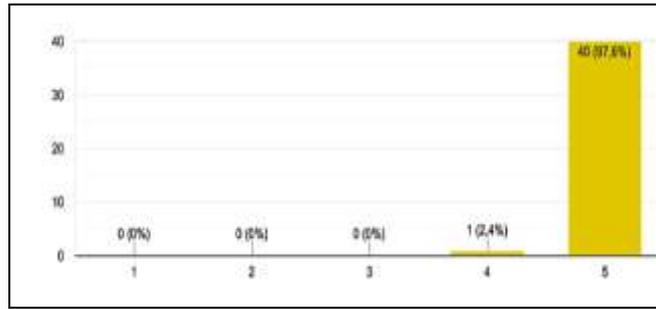


Figure 4. The benefits of applying the competency dimension to the writers of the learning module books (41 contributors on a 5-digit hedonic scale).

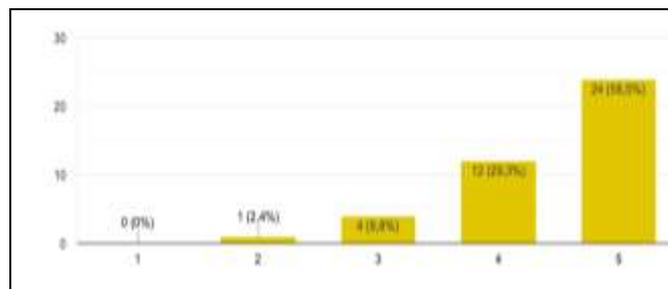


Figure 5. Effective implementation of the strategy sequence of the application of the competency dimension (1-5) in learning (41 responders on a 5-digit hedonic scale).

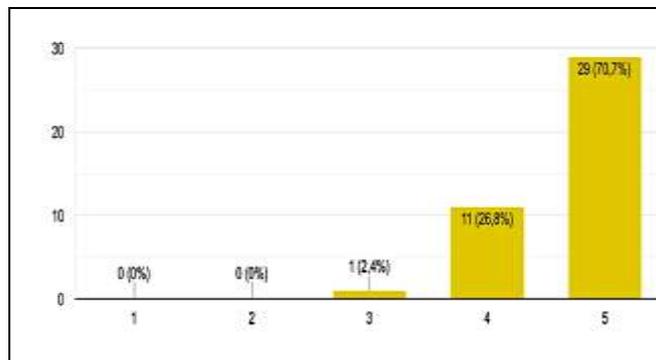
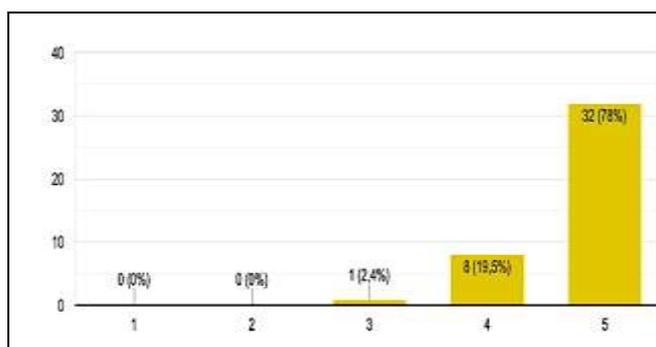


Figure 6. Percent of book writers who will apply the five dimensions of competence in the development of learning modules after the FGD (41 responders on a 5-digit hedonic scale).



Picture 7. The quality level of learning models generated by applying the competency dimension (41 responders on a 5-hedonic scale scale).

From the results of applying the competency dimensions and discussion in the FGD, the module book writers are very interested in applying the sequenced competency dimension (1-5) in writing training module books, useful in developing modules, providing effectiveness in learning delivery strategies, and improving the quality of learning. The module book writer were sure that this strategy and learning media will improve the instructional, This is in line with [18] who found that learning media has an impact on increasing the enthusiasm and meaningfulness of students' independent learning.

g. Model Design

From the discussion above, this study develops a delivery strategy model based on competency dimensions as an ecosystem of one's competence, where competence contains elements of skills at work, knowledge at work and attitudes at work. So this model is called “1-5 Sequenced Dimension of Competency Model” of Learning Delivery Strategy. (Figure 8)

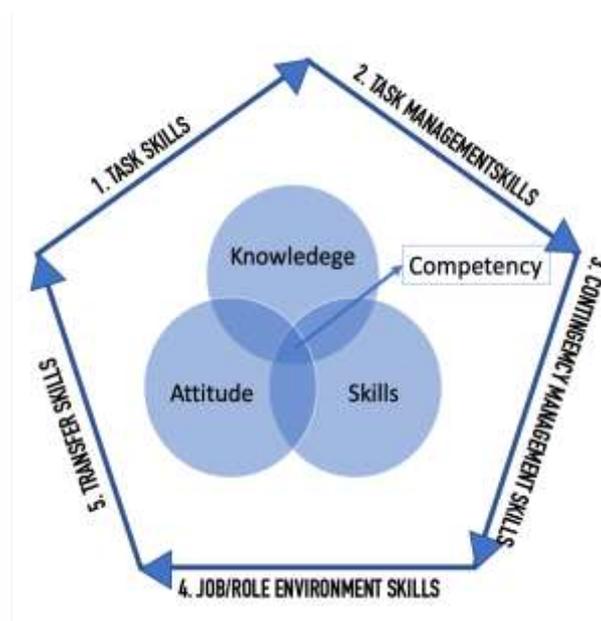


Figure 8. The “1-5 Sequenced Dimension of Competency Model” of Learning Delivery Strategy.

Table 2. “1-5 Sequenced Dimension of Competency Model” of Learning Delivery Strategy and its advantages.

DIMENSION OF COMPETENCY	DELIVERY	ADVANTAGES/ BENEFITS
1. Task Skills , specific steps of performance which must be executed according to an acceptable industry	<ul style="list-style-type: none"> • This requires the performance of the task in accordance with the standards required by the workplace. • Understanding the concept and principles of the task. • Internalize how competency standards are applied in the industry, and how SOPs are in accordance with customer 	<ul style="list-style-type: none"> • important in order to be able to successfully complete many common tasks found in most work environments. • employers will favour people who

<p>standard.</p>	<p>requirements, standards and regulations.</p> <ul style="list-style-type: none"> • Follow step by step the standard operational procedures. • Do it repeatedly until it reaches the required standard level and until it feels confident to carry out its duties. • Conduct self-assessments to ensure competency outcomes. 	<p>can demonstrate successful achievements in these areas.</p> <ul style="list-style-type: none"> • Improve precision and accuracy.
<p>2. Task Management Skills: Perform multiple tasks simultaneously.</p>	<ul style="list-style-type: none"> • Explain that in a real workplace, the role of a position will do more than one task. • Identifying the core of job functions / tasks in the work place specified by the company, or can be identified in the occupational description of the certification scheme. • This includes the ability to coordinate a number of different tasks to achieve overall work. • Ensuring that all tasks are competent to achieve. • Manage tasks: <ul style="list-style-type: none"> ○ Have a positive attitude. ○ Create a plan. ○ Manage up effectively. ○ Know your perfect juggling amount. ○ Focus on the task at hand. ○ Complete something every day. 	<ul style="list-style-type: none"> • Help the participant to work efficiently to meet deadlines, handle a sequence of interrelated tasks and progress smoothly between tasks.
<p>3. Contingency Management Skills: The requirement to respond to irregularities and breakdowns in routines.</p>	<ul style="list-style-type: none"> • Identification of problems that have either been experienced by the workplace, other sources of information (textbooks, journals, report documents, etc.). • Provide interventions in the form of irregularity or damage and how to respond to resolve the problem • Identify alternative actions to overcome each problem. • Exercise to overcome and manage problems until reaching mastery. 	<ul style="list-style-type: none"> • help the participant to respond appropriately to irregularities and problems in routine activities within a job/workplace.
<p>4. Job/role Environment Skills: fitting in with the workplace environment.</p>	<ul style="list-style-type: none"> • Identification of work environment requirements from the workplace, other sources of information (textbooks, journals, report documents, etc.). Workplace requirements are usually referred to as good practices (GMP = Good Manufacturing Practices, GLP = Good Laboratory Practices, etc.) issued by international writer ties or organizations. • Work to follow SOPs in Good Practices and communicate with colleagues. 	<ul style="list-style-type: none"> • Improve capacity to work with others and adapt to different situations, which are central to successful performance.
<p>5. Transfer Skills, skilled at applying their skills to new situations</p>	<ul style="list-style-type: none"> • Providing context in learning can be new contexts, new specifications, new requirements. • Focus on the relevance of what you're learning. • Take time to reflect and self-explain. • Use a variety of learning media. • Change things up as often as possible. • Identify any gaps in your knowledge. • Establish clear learning goals. • Practise generalising. • Make your learning social. 	<ul style="list-style-type: none"> • Provides greater flexibility in the ability to deal with changes in wants and demands of different workplaces that continue to grow. • Provides greater diversity capability to reach the function area due to overcoming wide variable boundaries. • Provides greater portability for moving workplaces, regions or countries. • Gives the ability to work productively even if you have

		never had experience before. • Providing great innovation ability because it is competent in managing various tasks, overcoming problems, working and meeting workplace requirements, to transfer skills, innovation will be easier to do.
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From the above model, some learning activities can be carried out in sequential dimensions of competencies. These activities include:

- Development of instructional designs
- Development of learning modules.
- Development of learning strategy designs
- Development of competency-based assessments
- Development of assessment tools at the CBA (Competency Based Assessment).

This model has been tried by 44 module writers in the field of community development by producing 72 learning module titles.

IV. CONCLUSIONS

Based on the results obtained and discussion, it can be concluded that:

- By managing delivery sequenced process follow the order of five dimension of competency can facilitate learning and improving performance and effectiveness of learning.
- The sequence of learning delivery of: First, Task skills; Second, Task management skills; Third Contingency management skills; Forth, Job/roles management skills; and Fifth, Transfer skills, could facilitate learning and improving performance.
- The “1-5 Sequenced Dimension of Competency Model” of Learning Delivery Strategy. could be used to improve:
 - The development of instructional designs
 - The development of learning modules.
 - The development of learning strategy designs
 - The development of competency-based assessments
 - The development of assessment tools at the CBA (Competency Based Assessment).

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