



# Applicability of Competency-Based Assessment for TVET Interns: Comparing between Indonesia and Laos

Ana A<sup>1\*</sup>, Isma Widiaty<sup>2</sup>, Dewi Eka Murniati<sup>3</sup>, Deauansavanh<sup>4</sup>, Saripudin S<sup>5</sup>, Michael Grosch<sup>6</sup>

<sup>1,2</sup> Technology and Vocational Education Post-Graduate School of Universitas Pendidikan Indonesia, INDONESIA

<sup>3</sup> Universitas Negeri Yogyakarta, INDONESIA

<sup>4</sup> National University of Laos, LAOS PDR,

<sup>5</sup> TEDC Polytechnic Bandung, INDONESIA

<sup>6</sup> Karlsruhe Institute of Technology KIT GERMANY

DOI: <https://doi.org/10.30880/jtet.2019.11.02.005>

Received 29<sup>th</sup> August 2018; Accepted 18<sup>th</sup> March 2019; Available online 30<sup>st</sup> June 2019

**Abstract:** This study is an international research collaboration of RAVTE (The Regional Association for Vocational Teacher Education in East and Southeast Asia) members which analyses the assessment of students' internship using Competency-Based Assessment (CBA) approach. This study analyses the application of CBA for internship assessment using four relevant CBA subcategories: 1) Standards, 2) Planning, 3) Methods, 4) Evidence and Judgment. The study aims to take a portrait of CBA application in selected three universities, two in Indonesia and one in Laos. The research used a descriptive quantitative approach which conducted among 85 samples. The results give an understanding on the suitability of CBA implementation in each country and to identify potential obstacles. The study revealed that respondents from both countries were quite successful in using evidence and judgement for CBA. However, there were differences in the performance of internships assessment. Most respondents at the two universities use the CBA standards for their internships programs. While the Indonesian samples are successful at applying CBA principles of planning (89.39%), the surveyed respondents from Laos still seemed to have more difficulties in this area (61.2%). While the Indonesian universities rated good in using methods to assess the application in the internship industry (78%), it was found that the methods used for assessing students' internship at the university in Laos was less satisfying (35.5%). Some issues identified includes unclear guidance of competencies identification unit, lack of mechanism for coordination between quality assurance institutions, and a very limited access for industry collaboration and participation in the assessment planning, standard, method, and judgment.

**Keywords:** Competency-Based assessment, students' internship, vocational school

## 1. Introduction

Industries in general, the small medium enterprises (SMEs) in particular which are partners of vocational schools in several ASEAN countries joining the RAVTE (Regional Association of Vocational Education Teachers in East and Southeast Asia) have a homogeneous problem in implementing a proper internship assessment. Technical and Vocational Education and Training (TVET) institutions, especially colleges and universities, are also facing challenges during the assessment, in monitoring and evaluating the internship achievements. These conditions lead to several issues, including the unpreparedness of students taking the internship in the industry.

Assessment imposes a powerful impact on students learning. If it is not designed well, it can undermine the positive influence of a particular teaching and learning approach. Students' learning performance can be reflected in competency-based assessments (CBA). CBA originates from the development of vocational training qualifications in some countries. Through competency-based assessment, students show what they know and learn by demonstrating a specific task. CBA also has positive effects on students' performance. By having a chance in negotiating the assessment activities, students will get more ideas on how they would be evaluated. This also asks for their better understanding of the assessed materials and concepts. However, the assessment has been seen as a separate component from the curriculum (Smith, 2010) and neglected as an important role for competencies improvement. Thus, assessors need to recognise competency as an evaluative object that has different evaluation tools (Muñoz & Araya, 2017).

Nevertheless, Darling-Hammond and Wentworth (2010) argue that several nations including Australia, Finland, Singapore, United Kingdom, Hong Kong, and Sweden provide benchmarks in integrating assessment into the curriculum in order to create a more favourable learning environment and to achieve better outcomes. Assessment has a vital role for learning, instead of as a separate element of the curriculum. Moreover in these nations, assessment provides not only feedback to students, but also a guide and information to shape future learning, align with curriculum expectations and desired learning outcomes, enhance teachers' professional capability, and improve students' motivation in higher-order thinking skills through a variety of assessment tools and strategies.

The execution of internship assessment at several universities in Indonesia and Laos turned out to not have a standard assessment that is capable of measuring the working competence of students in the industrial practice. From this finding, it is necessary to analyse the creation of the internship assessment with a Competency-based Assessment approach which is in accordance with the demands of standard operational procedure of the industry as a partner. Competency-based Assessment is directed to measure the performance of students in cognitive, psychomotor and affective abilities; either directly during learning activities or indirectly through evidence of learning outcomes (evidence of learning) in accordance with the performance criteria. These performance criteria should be in conformity with the demands of the working world because at the end of competence criteria, students or graduates should receive recognition from the working people in the workforce.

Hodges (2011) argues that identification of students' skill performance that is required for industry placement and assessment criteria recognition which is applicable for industry context can be assisted by the commitment of school institution and the industry. Therefore, a study on TVET teachers' capacity in implementing CBA is critically necessary. This research setting analyses teaching and learning processes at UPI Indonesia, UNY Indonesia, and NUoL Laos in order to investigate the internship assessment, including: 1) Standards, 2) Planning, 3) Methods, 4) Evidence and Judgment. The research finding is relevant as an input and for making recommendations on implementing higher quality internship program in vocational education and training. From the background of the problems described above, the research investigated the experiences with the implementation of the CBA approach to assess students' internship in different vocational fields.

## 1.1 Competency-based Assessment (CBA)

In vocational education and training (VET), competency-based training plays the key role to provide three main components namely (Guthrie, 2009):

- a. Units of competency which identify a range of knowledge and skill and its application to industry standard of performance
- b. Qualifications that are generated from grouping some units of competency appropriate to the national framework
- c. Assessment guidelines to offer an industry outline to examine the specified competency.

Maxwell (2010) argues that competency-based assessment (CBA) assists VET students to achieve a degree and also to be employable. On the other hand, VET teachers need to fully understand the comprehensive application of the assessment. Since a collection of evidence is required to be demonstrated in order to show students' performance in accordance to the specific standard (Singapore Workforce Development Agency, 2010), therefore TVET teachers need a range of assessment tools in evaluating the competencies (Maxwell, 2010). Department of Training and Workforce Development, Western Australia (2016) stated that the evidence can be provided directly from the working place, indirectly by performing formal testing, and supplementary from employers' references. Evidence gathered for the assessment must be valid, sufficient, authentic, and current.

To successfully implement CBA, some principles are required including validity, reliability, flexibility, and fairness. Validity guarantees that the assessment decision is based on the students' performance. Reliability implies that all evidence is consistently examined. Flexibility provides the reflection of students' needs, while fairness implies that each individual is treated and facilitated equally, especially those with special needs. These principles also entail that the responsibility of teachers nowadays need to shift to be more of sophisticated pedagogical repertoire (Guthrie, 2009) rather than traditional conservative pedagogies. Teachers' capabilities are demanded to work with a mixture of learning context and to support the integration of learning and working as a widely used feature in modern working environment.

Competency-based assessment is a form of assessment based on the specification of a group of outcomes that is represented in the standard competency, which allows the assessors to make the decision based on the outcomes

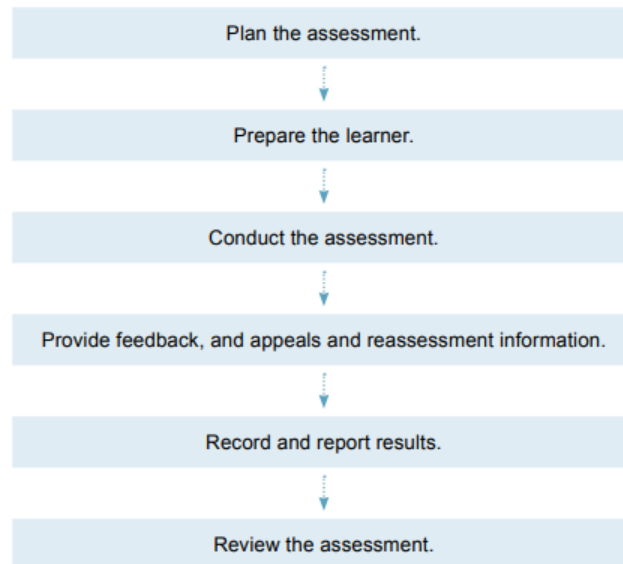
(Singapore Workforce Development Agency, 2010). This assessors' judgment is classified into competent and not yet competent. CBA has conditions including:

- a. Focus on outcome based on students' real performance. Evidence must be collected to ensure that a student has satisfied every performance standard.
- b. Only two kinds of final judgments can be made, which are competent and not yet competent.
- c. Performance accomplishment must be showed and examined under the most possible industry-like setting.

## 1.2 Steps in planning and conducting CBA

The planning of the competency-based assessment involves: the understanding of the standards or benchmarks needed for the assessment; the identification of the evidence required for the assessments; the selection of gathering techniques; and the formulation of the assessment decision. Once the assessment tools, methods, and evidence identification are set, the assessor can start CBA arrangement with the key steps as described in Fig. 1 below. To ensure the practice of assessment delivers its promised outcomes, the assessor needs to clarify that:

- a. The learner recognises the assessment plan and is ready for the assessment
- b. The assessment tools package has been verified and tested with an appropriate sample of learners
- c. The assessment procedures have been re-evaluated by appropriate persons in the industry to certify the assessment task relevancy with industry requirements
- d. All parties in the assessment process agreed with the assessment time and place setting
- e. The learner necessities have been verified, including any logical adjustment i.e. disability to ensure them to participate in similar educational and training access as those without disability
- f. The assessment has been well-notified to all appropriate personnel



**Fig. 1. Planning and Conducting CBA**  
(Department of Training and Workforce Development, Western Australia, 2016)

## 2. Methodology

This study used a model of Sequential Explanatory by collecting and analysing quantitative data in the first phase, then collecting and analysing qualitative data in the second stage, then analysing and concluding overall data in general. Quantitative data collection is needed to capture information regarding the enforceability of the implementation of the CBA in terms of five aspects, namely: Standard, Planning, Method, Evidence and Judgment. Whereas qualitative data collection involves structured personal interviews and Focus Group Discussions (FGDs) which are arranged to be in line with the CBA questionnaire. Selection of interviewees and FGD participants are as random as possible, and assures that males and females of different age groups and wealth levels are represented.

This study involved 85 lecturers from two universities in Indonesia namely Indonesia University of Education (UPI) and Universitas Negeri Yogyakarta (UNY), and one university in Laos namely National University of Laos (NUoL). The research was conducted from March to October 2017. The instrument used to gather data in this study is the modification based on the designing assessment tools for quality outcomes from the Department of Training and

Workforce Education (2013). The instruments used checklists on what the vocational lecturers have done in the Assessment standard, Planning, Method, Evidence, and Judgment.

### 3. Results

The implementation of students' internship requires assessment. The assessment used in this work is based on the agreement and policy between universities and industries. Therefore, the assessments are varied according to the respective university and industry policies. The students' internship assessment in this study is needed to evenly apply a fixed standard to reach the expected goal.

#### 3.1 Standard

The assessment standard involves three aspects to evaluate, namely psychomotor, affective and cognitive. Fig. 2 showed the results for psychomotor and affective aspects in UPI achieved 100% for both criteria, while UNY achieved 85% and 92%. NUoL got similar result with UPI for psychomotor and exceeded UNY for affective aspect. As the result for the cognitive assessment, UNY, UPI, and NUoL achieved 100%, 97% and 96%, respectively. This indicates that the standard aspects of the students' internship assessment based on CBA method for the all aspects reached 85-100%, which showed significant results in all three universities. Competency-based assessment begins with establishing criteria required by the performance.

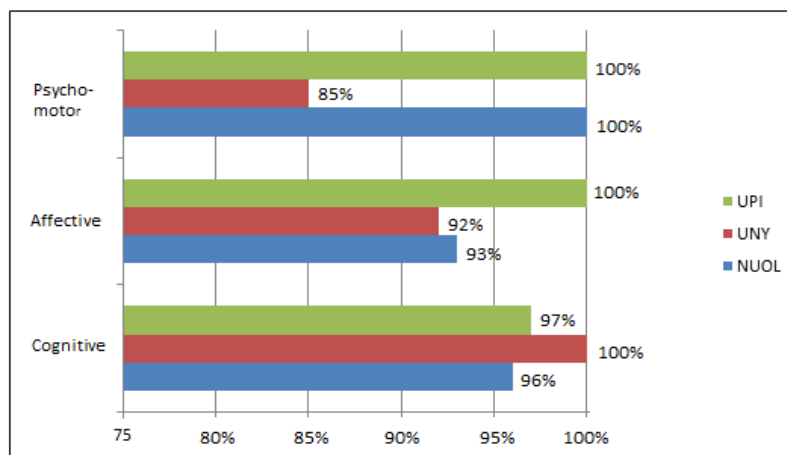


Fig. 2 - The assessment standard aspects for students' internship program

The industry supervisors set up these criteria in two ways, which are in quantitative-based and in qualitative-based. The supervisors can then draw conclusions and continue to assess the students' performances. The usage of quantitative and qualitative criteria across 3 universities to assess the students can be seen in the Fig. 3.

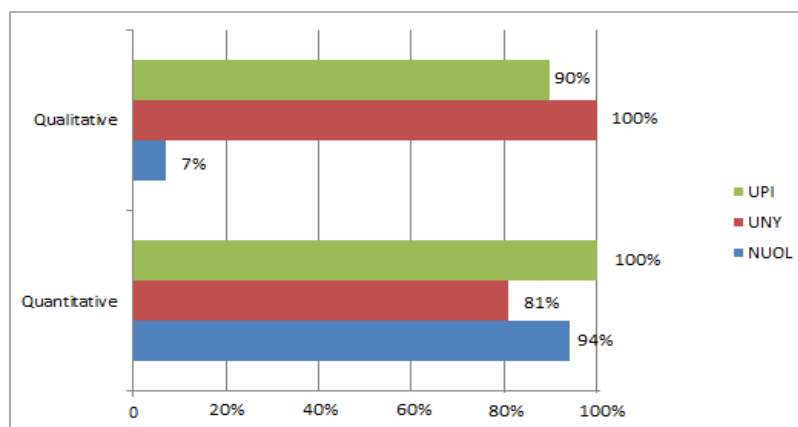
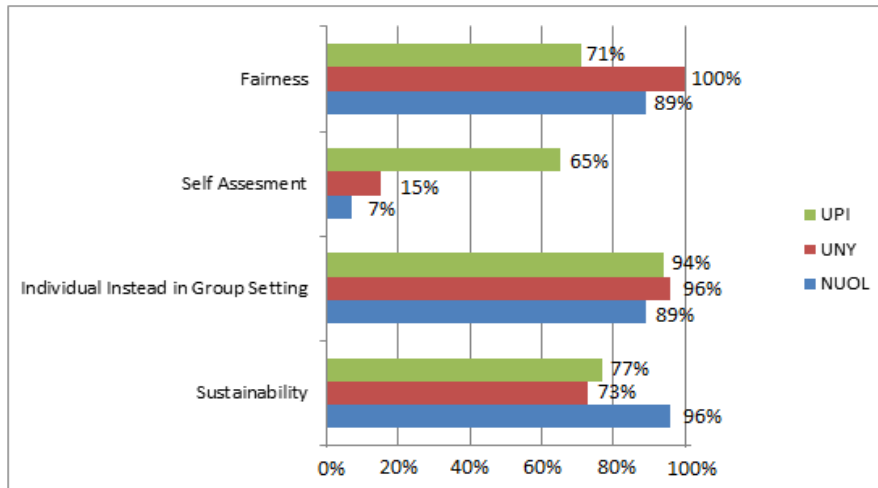


Fig.3 -The assessment standard criteria for students' internship program

UPI, UNY, and NUoL implemented quantitative assessment by 100%, 81% and 94%, respectively. UPI and UNY used not only quantitative, but also qualitative assessment for about 90% and 100% correspondingly. Qualitative approach is

the least preferred by supervisors in NUoL as it amounted to only 7%. This will be a particular concern for the organisers of both universities and industry in undertaking more objective assessments.

In the assessment process of students' internship, there are several principles used in the CBA. The first is the principle of justice, which helps to identify the objective, periodic, and continuous process of assessment, so that the data obtained will be more objective corresponding to what had been done by students during their internship. The second principle is individual assessment, which helps to assess student's performance during the preparation, implementation, and evaluation of their internship. The third principle is the individual mastery in the student group, which helps to identify the work behaviour in student groups. The fourth principle is the sustainability of the internship process in which students must be able to hold the internship principles that have been obtained and to develop them after their internship is completed. The internship principles can be seen in Fig. 4 below:



**Fig. 4 -The CBA principles standard used in students' internship program**

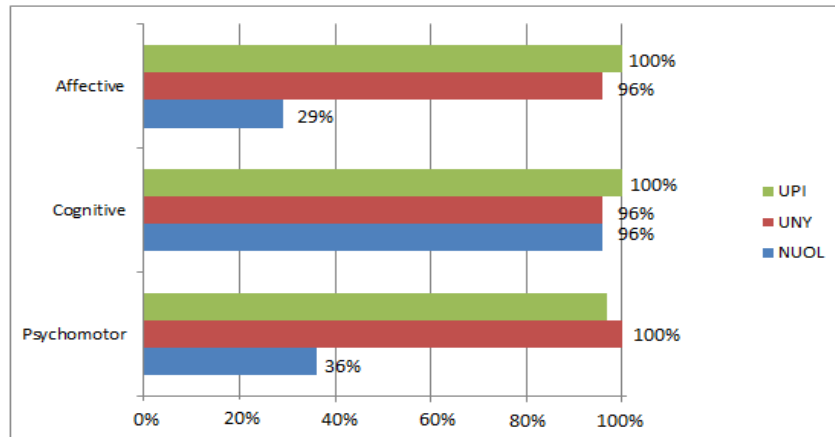
Fig. 4 shows that the standards of students' internship based on CBA are not equal. This can be seen from the imbalance percentage distribution of the four principles of students' internship assessment. The principle of fairness for UPI, UNY, and NUoL are 71%, 100%, and 89%, respectively. The principle of self-assessment shows 65%, UNY 15% and NUoL 7%. This shows how low individual assessment is used in the assessment form.

The third principle is the assessment of individual work behaviour in group where UPI achieved 94%, UNY 96% and NUoL 89%. This shows that the application of individual work behaviour in teamwork setting during the internship is significant. As for the assessment principle of sustainability, where assessment is taken continuously throughout the internship program, UPI reached 77%, UNY 73% and NUoL 96%.

### 3.2 Planning

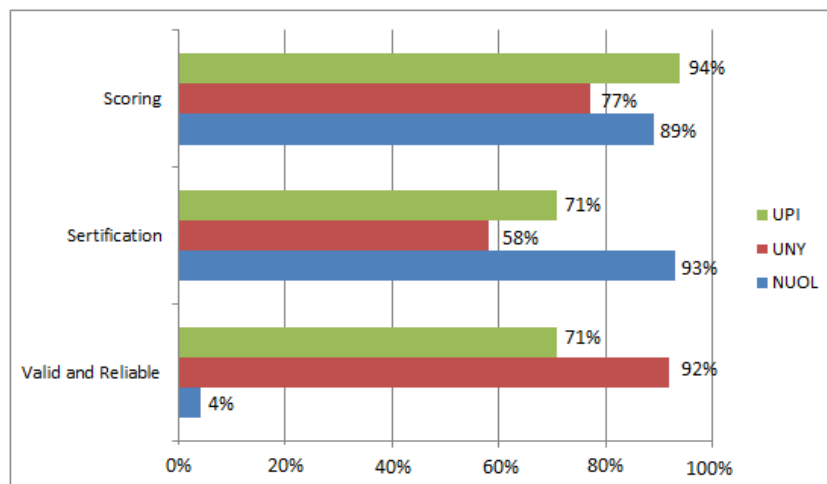
This CBA planning assessment has four aspects, namely the design of internship instruments in CBA, the design of internship assessment criteria in CBA, the design of the work type assessment within the CBA, and the design of internship principles draft in the CBA. In the planning stage, the first thing to do is to design the students' internship instruments as shown in Fig. 5 below:

Fig. 5 shows the three aspects in students' internship instrument design based on CBA that include psychomotor, affective and cognitive. UPI (Indonesia) showed significant result for affective and cognitive aspect. It reached 100% use in students' internship instrument design based on CBA. UNY reached 100% for psychomotor aspect and 96% for affective and cognitive aspect. As for NUOL, cognitive aspect assessment reached 96%, while the affective and psychomotor were 29% and 36% respectively. This suggests that the use of cognitive aspects by the three universities is still dominant compared to the affective and psychomotor aspects.



**Fig. 5- The design of assessment criteria**

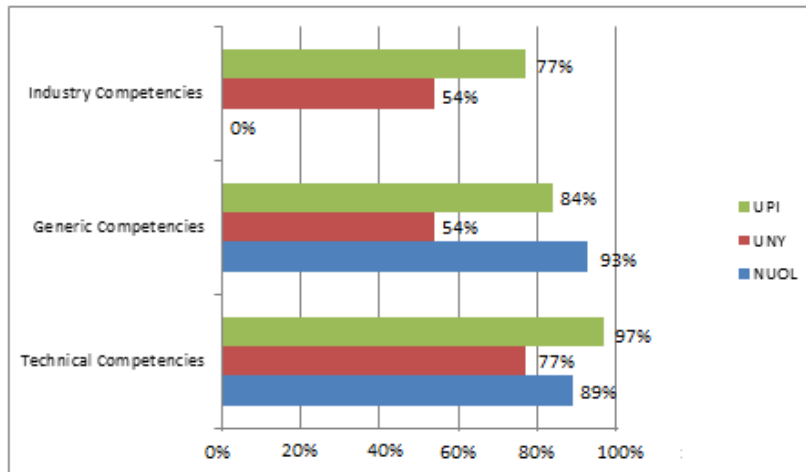
Next, at this planning stage, the instrument design criteria of students’ internship assessment based on CBA includes validity and reliability, certification and scoring. The assessment can be seen in Fig. 6 below:



**Fig. 6- The design of instrument criteria**

It can be seen that the significant results used in the design of instrument criteria fell on 94% (UPI), 77% (UNY) and 89% (NUOL) in the scoring aspects. The validity and reliability aspects reached 71% (UPI), 92% (UNY) and 4% (NUOL). The certification aspect is less used by all three universities. Among the three aspects used, the one used the most is the scoring aspect.

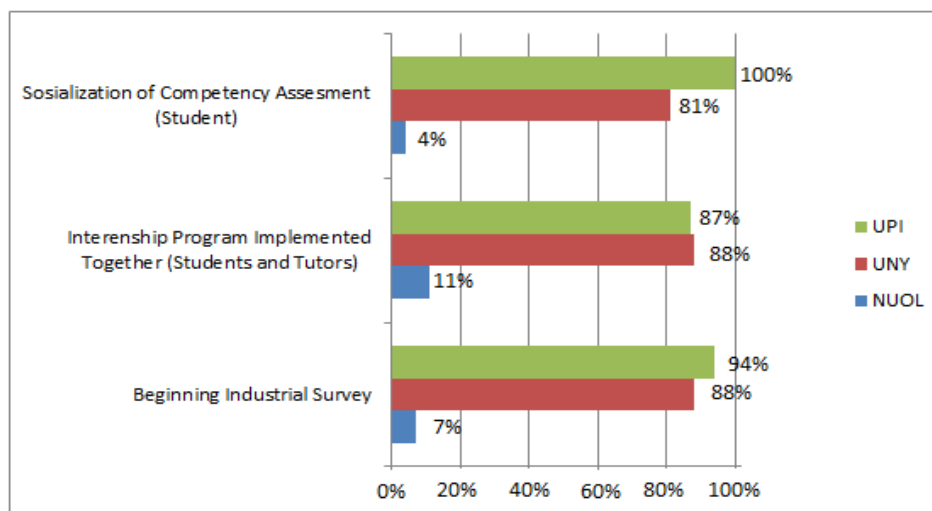
The design of work type instrument of students’ internship based on CBA consists of 3 aspects, namely technical competence, generic competence and industry competence. This assessment can be seen in Fig. 8 below:



**Fig. 7. The design of work type instrument**

The technical competence aspect is most widely used by the three universities: 97% (UPI), 77% (UNY) and 89% (NUOL). The aspect of generic competence was used by UPI by 84%, UNY by 54%, and NUOL by 93%. UPI used industry competencies by 77% and UNY by 54% while NUOL did not include that at all.

The implementation of students' internship should be initiated with principal activities on the assessment criteria of students' internship based on CBA. The design of the criteria principles of students' internship based on the CBA consists of 3 aspects, namely industry survey, students' internship program or joint work practice, and socialisation on student's competency assessment. Fig. 8 shows the principal design of assessment based on CBA.

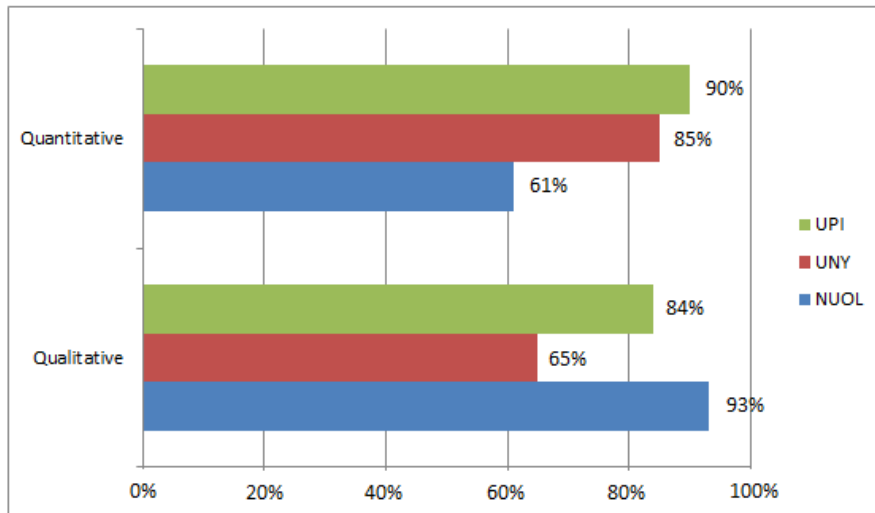


**Fig. 8. The design of students' internship initialisation**

UPI started planning the students' internship by 100% through supervisors informing the students, 87% by organising it between students and supervisors, and 94% by holding an industrial survey before beginning the internship. UNY also began the program 88% by conducting industrial survey and arranging with students and supervisors, but only 81% by socialising to students. On the other hand, only 4 out of 100 supervisors informed the program to students in NUOL, and began with industrial survey and arrangement with students, with 11% and 7% respectively. Good preparation in planning the internship program affects to better the knowledge on industry environment and communication and coordination between supervisors, and supervisors throughout the program.

### 3.3 Collecting Method

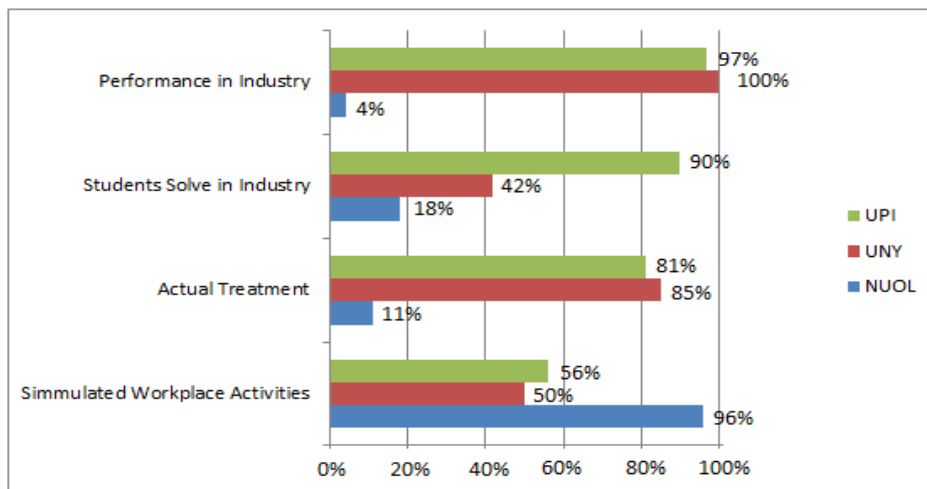
The assessment of the implementation of students' internship uses three methods, namely the method of students' internship assessment form based on CBA, method of work performance of students' internship based on CBA method, and method of students' internship assessment based on CBA. These methods are used to obtain accurate information and student assessment data during students' internship. The method of assessment form could be seen in Fig. 9 below:



**Fig. 9 - The method of students' internship assessment form**

Assessment data is taken in two methods, namely qualitative and quantitative as an effort to obtain accurate and objective data. The qualitative assessment is dominantly performed by UPI and NUOL by 84% and 93%, while UNY is 65%. Quantitative method performed by UPI is 90%, UNY 85% and NUOL 61%.

The implementation of students' internship requires work performance assessment in accordance with the purpose of students' internship implementation. In this method, some aspects of assessment are undertaken, namely activity simulation in the workplace, actual treatment, self-evaluation in industry and work process in industry. The result of those methods can be seen in Fig. 10 below:



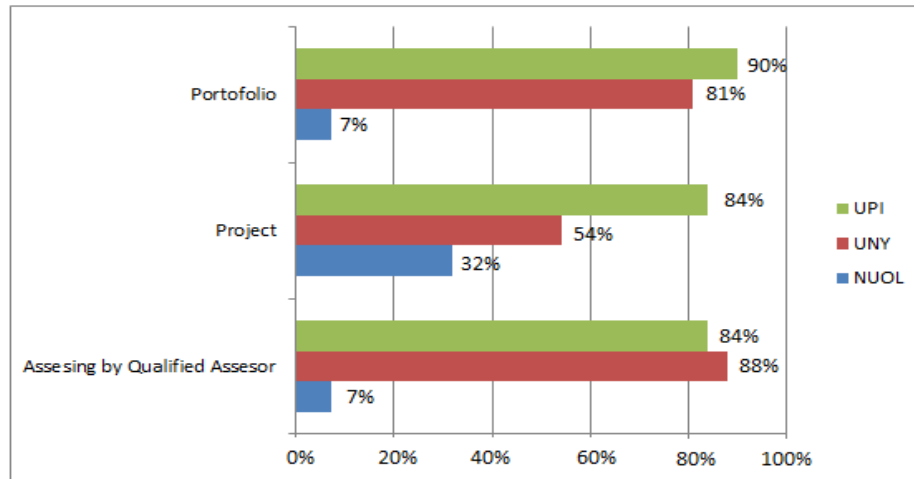
**Fig. 10. The method of working performance assessment in students' internship**

Every aspect has been unevenly applied in the students' internship based on CBA. NUOL dominates the outcomes in the workplace simulation aspect at 96%. Only about half the population of UPI and UNY implemented the simulation. On the other hand, on the aspect of actual treatment NUOL gained 11%, while UPI achieved 81% and exceeded by UNY with 85%.

Students' problem solving aspect showed that UNY and NUOL applied less than half percentage while UPI succeeded in applying 90% performance. In contrast, UNY reached 100% of work performance in the industry while UPI reached 97% and NUOL reached less than 5%.

From the students' internship outcome point of view, the method of assessment can be traced by using three aspects, namely by students portfolio, by students project and by qualified assessors judgment. These three aspects are used to find out more objective results. The results for this method can be seen in Fig. 11 below.



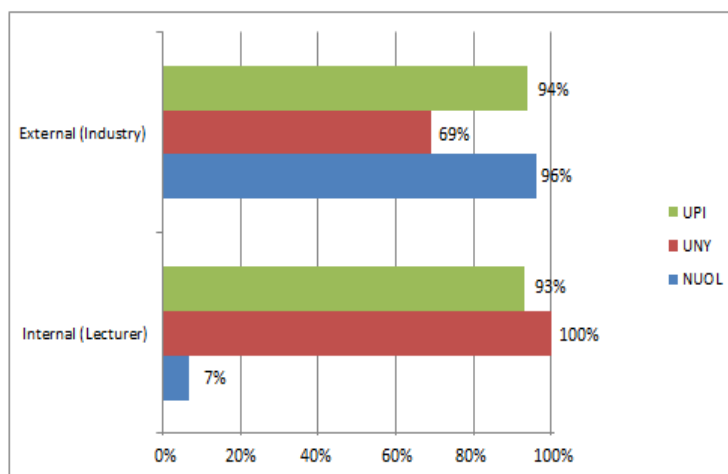


**Fig. 11 - Assessment method of students' internship based on CBA**

As showed in the figure 11, it can be seen that UPI used assessment by project at 84%, while UNY at 54%, and NUoL at 32%. Meanwhile the assessment by the qualified assessor is 84% for UPI and 88% UNY. Portfolio on this assessment aspect was 90% for UPI and 81% by UNY. By contrast, NUoL only reached 7% for two indicators (assessment by assessor and portfolio). From the results in the figure above, it can be concluded that project assessment is more often used compared to two other aspects.

### 3.4 Evidence and Judgment

The final assessment obtained in students' internship is taken from variety of evidence. Fig. 12 below explains the source of the final assessment of students' internship based on CBA.



**Fig. 12 - Source of final assessment of students' internship based on CBA**

To gain objectivity, assessment is conducted from two sources, namely the internal (lecturer) and external (the industry side). External assessment still dominates as a source of students' internship with 94% (UPI), 69% (UNY) and 96% (NUoL). Meanwhile, the internal assessment in this students' internship is 93% (UPI), 100% (UNY) and 7% (NUoL). Fig. 12 shows that NUoL still lacks internal involvement (supervisor) as a source of assessment of students' internship. To make judgment, there are three assessments: the final assessment of students' internship based on the CBA, the context determination of the final assessment of students' internship based on CBA, and the final decision making process of students' internship assessment based on CBA. The figures shown below describe each component. Firstly, Fig. 13 comprises of the type of final assessment to judge the performance which consist of summative, formative and validity evidence aspects.

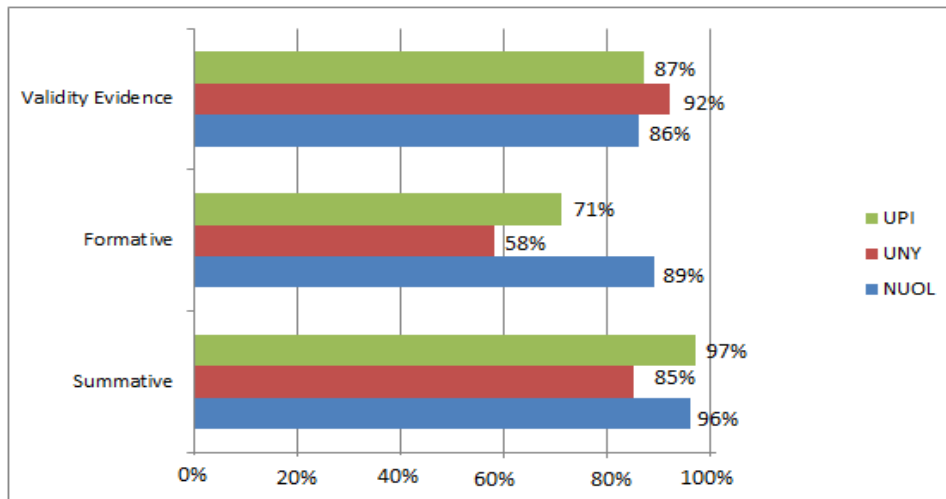


Fig. 13 - The type of final assessment of students' internship based on CBA

The nature of the final assessment based on Figure 13 shows that evidence is dominantly used with 87% (UPI), 92% (UNY) and 86% (NUoL). As for the summative aspect, it is 97% (UPI), 85% (UNY) and 96% NUoL). The third aspect is formative with 71% (UPI), 58% (UNY) and 89% (NUoL). Secondly, in the provision of the context of final score, one of the ways is through a test to get valuable data and then proceed to determine the final score that includes psychomotor, affective and cognitive aspects as the test material.

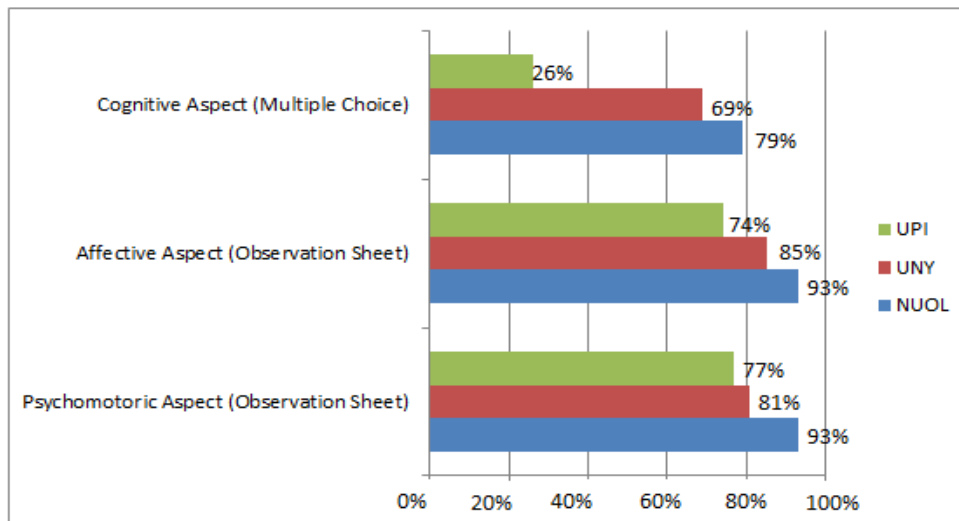


Fig. 14 -.The context of final assessment of based on CBA

The psychomotor aspects through observation sheet show that 77% has been achieved by UPI, 81% by UNY and 93% by NUoL. Observation sheets were also used for assessment on affective aspects and shows 74% (UPI), 85% (UNY) and 93% (NUoL). The cognitive aspect uses the multiple choice test and it shows 26% (UPI), 69% (UNY) and 21% (NUoL). Based on Fig. 14, it can be seen that cognitive aspect in UPI has not been optimally used in determining the final assessment test of students' internship.

Thirdly, after various sources of data and assessment have been collected, the assessment decision process is conducted by considering three indicators: competent versus incompetent judgment, matching performance evidence with competence and performance and individual analysis in Fig. 15 below:

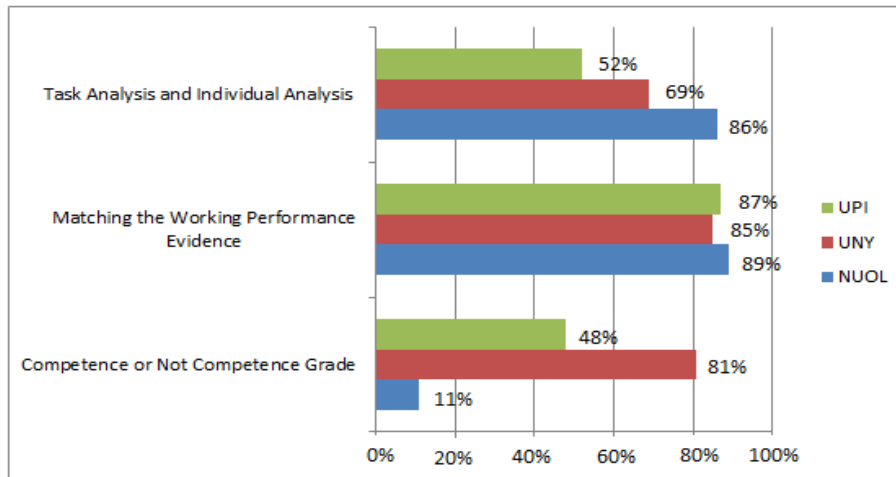


Fig. 12 Provision of final decision of students' internship based on CBA

As much as 87% of UPI applied the working performance evidence to obtain the final decision, 52% used task and individual analysis and 48% used competent or not competent grade. While about 80% of UNY applied competent or not competent grade and the working performance evidence and 69% used task and individual analysis. Among three universities, NUoL achieved the largest amount in implementing working performance evidence and task individual analysis as bases of grading, but used the least criteria for competent or not competent. The figure showed that to make the final decision, working evidence is widely used in the 3 universities.

#### 4. Findings and Discussion

Research results found that the internship applied in surveyed universities show some differences in their Competency-Based Assessment implementation. UPI and UNY Indonesia have been very good at sticking to the principles of planning, while NUoL Laos still lacks in planning the assessment by using CBA. There is a room for improving the implementation of students' internship appraisal using CBA in NUoL, Laos. While UPI and UNY Indonesia rated good in using methods that match with those implemented in the industry. Nevertheless, the three universities in both countries have implemented CBA related to evidence and judging.

As a realisation of being relevant to industry, TVET curriculum puts a heavy importance on students' internship as a productive program. TVET institution is highly required to link and match the graduates to industry needs (Wisudha, 2017). Indonesia has initiated dual system program since 1997 by adopting German vocational education system with some adjustments to the condition in Indonesia (Ministry of Education and Culture, 2016). Industry involvement in school's education system is vital to minimise the gap of students' competency towards industry demand. Industry shall participate in the curriculum development as well as learning and assessment process. In fact, TVET institutions in Indonesia still face huge challenge to approach the industry. TVET institution sees industry apart from education system, even though industry will be the work place for the TVET graduates. As a result, industry acknowledgement on students' competency assessment is poor (Santosa, 2010).

While in Laos, the quality assurance of education and training has been managed by the government since 2008. Guidelines for self-assessment as well as external assessment are aligned with trends and good practices in Asia-Pacific region. Competency-based assessment in Laos has also been initiated. Nevertheless, the quality assurance of qualification is still indistinguishable. In addition, the responsible body for conducting the certification process is also unclear (UNESCO, 2017).

Competency-based assessment approach varies between countries in Asia, however the assessment method of observation and portfolios are widely used (UNESCO, 2017). Yet, some countries in Asia found difficulties in using evidence to finally make assessment decision. The other primary issue is the main focus of assessment quality assurance. Throughout Asia, these problems may arise from the lack of using external assessor, hence the quality of assessment approach is weak (UNESCO, 2017). However, Laos PDR trains their internal assessors and Indonesia has qualified trained assessors even though other countries do not indicate the assessor capability except the Philippines.

The study reveals a portrait of CBA application differences in each indicator within each institution in Indonesia and Laos, which was used in this research. Despite some good practices reported by some countries in Asia (UNESCO, 2017), clear guidance needs to be delivered to competence standard developers in identifying unit of competencies (Mulder, 2017). Moreover, the mechanism for coordination between quality assurance parties need to be enhanced, and industry contribution to the education system especially the assessment quality assurance shall be highly taken into account.

## 5. Conclusion

The quality of TVET qualification system is determined by the skills of assessors, since they are responsible in making judgment on evidence against standard set in the system. CBA has been widely used in TVET as a tool for assessing individual's competency to match with national qualification framework (NQF). In some Asian countries, the assessment quality has been assured; however there is an inadequate arrangement to ensure that the outcomes (judgment) and qualifications align with those described in NQF. TVET institutions in Indonesia and Laos used in this study represent these shortcomings. The studied institutions are found to have weak CBA standard, planning, and methods. Nevertheless, based on some reports done by other sources of information, several progress have been accomplished in terms of industry involvement in the curriculum, assessment planning and standard improvement, as well as the use of external assessor from the industry to gain better judgment in individual's competency.

## References

- Darling-Hammond, L & Wentworth, L. (2010). *Benchmarking learning systems: Student performance assessment in international context*. Stanford, CA: Stanford University, Stanford Center for Opportunity Policy in Education. Retrieved from <http://www.ncee.org/wp-content/uploads/2010/11/BenchmarkingLearningSystemHAMMOND.pdf>
- Department of Training and Workforce Development. (2013). *Designing assessment tools for quality outcomes in VET* (4<sup>th</sup> ed). Western Australia. Retrieved from <http://hdl.voced.edu.au/10707/338513>
- Department of Training and Workforce Development, Western Australia. (2016). *Assessment in the VET sector*. Retrieved from <http://www.dtwd.wa.gov.au/sites/default/files/uploads/Assessment%20in%20the%20VET%20Sector%20-%202016%20-%20Final.pdf>
- Guthrie, H. (2009). *Competence and competency based training: What the literature says*. National Centre for Vocational Education Research (NCVER), Australia.
- Hodges, D. (2011). *Assessment in cooperative and work-integrated education*. In R. K. Coll & K. E. Zegwaard (Eds.), *International handbook for cooperative and work-integrated education: International perspectives of theory, research and practice* (pp. 53–62). Lowell, MA: World Association for Cooperative Education.
- Maxwell, S. (2010). *Using rubrics to support graded assessment in a competency-based environment*. NCVER Building Researcher Capacity Community Of Practice Scholarship Program 2008 Occasional Paper. Retrieved from <https://files.eric.ed.gov/fulltext/ed509189.pdf>
- Mulder, M. (2017). *Competence-based Vocational and Professional Education. Bridging the World of work and Education*. Switzerland: Springer. ISBN: 978-3-319-41713-4
- Muñoz, D. R. & Araya, D. H. (2017). *The challenges of competence-based assessment in the educational field*. *Educ. Pesqui.*, São Paulo, v. 43, n. 4, p. 1073-1086, out./dez., 2017. DOI: <http://dx.doi.org/10.1590/S1678-4634201706164230>. Retrieved from [http://www.scielo.br/pdf/ep/v43n4/en\\_1517-9702-ep-S1678-4634201706164230.pdf](http://www.scielo.br/pdf/ep/v43n4/en_1517-9702-ep-S1678-4634201706164230.pdf)
- Santosa, B. (2010). *Integrated Competency-Based Assessment in Vocational Secondary High School in Yogyakarta*. *Proceeding in International conference on Vocational Education and Training*. Universitas Negeri Yogyakarta. ISBN: 978-602-97249-0-5
- Singapore Workforce Development Agency (2010). *Develop Competency-Based Assessment Plans*. Retrieved from [http://www.ssg.gov.sg/content/dam/ssg-wsg/ssg/TrainingOrganisations/cd/CBAP\\_%20worksho2\\_20121018\\_QAD\\_v02final.pdf](http://www.ssg.gov.sg/content/dam/ssg-wsg/ssg/TrainingOrganisations/cd/CBAP_%20worksho2_20121018_QAD_v02final.pdf)
- Smith, E. (2010). *A review of twenty years of competency-based training in the Australian vocational education and training system*. *International Journal of Training and Development* 14:1. ISSN 1360-3736. Retrieved from <https://onlinelibrary.wiley.com/doi/epdf/10.1111/j.1468-2419.2009.00340.x>
- UNESCO. (2017). *Towards Quality Assurance of Technical and Vocational Education and Training*. ISBN 978-92-9223-581-9