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The Adaptation of Qualification Standard in Digital Education for TVET Teachers based on Australian Qualification Framework in Indonesia: Expectation vs Reality

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ABSTRACT

Digital competency is one of the most important skills needed for TVET teachers in the 4th industrial revolution era. This study focuses on the expectations vs reality if digital competencies within the Australian Qualifications Framework (AQF) for Technical and Vocational Education and Training (TVET) teachers in Indonesia. The AQF provides a comprehensive framework for qualifications, ensuring consistency and quality across the education and training sectors. This study explores how the AQF can serve as a foundation for developing digital competencies within the TVET teacher training programs in Indonesia. Furthermore, this abstract investigates the current state of TVET teacher training programs in Indonesia, highlighting any gaps or limitations in terms of integrating digital competencies. The study used qualitative methods with FGD as an approach to collect data and uses a triangulation technique for validation. Drawing from these data, it offers recommendations and guidelines for Indonesian policymakers and education authorities to enhance the integration of digital competencies within TVET teacher training programs, aligning them with the AQF standards. Ultimately, this research aims to contribute to the professional development of TVET teachers in Indonesia, enabling them to effectively harness digital technologies in their teaching practices. By aligning the TVET teacher training programs with the AQF and integrating digital competencies, Indonesia can nurture a highly skilled workforce that meets the evolving needs of the labour market and drives the nation's economic growth in the digital era.

Keywords: *AQF, Digital Competency, Digital Education, TVET Teacher.*

1. INTRODUCTION

The Indonesian government, through the Making Indonesia 4.0 program, has developed a roadmap and strategy for Indonesia's entry into the digital world. This policy needs to be promoted to enhance the digital skills of the Indonesian population, as reflected in the level of ICT literacy among Indonesians. According to a survey conducted by the Program for International Student Assessment (PISA) released by the Organization for Economic Co-operation and Development (OECD) in 2019, Indonesia ranked 62nd out of 70 countries, placing it among the 10 countries with low literacy rates [1]. This condition is further supported by a survey conducted in 2021 to assess the digital skills of the Indonesian population amidst the Fourth Industrial Revolution [2]. The survey results indicate a relatively positive trend with over 70% utilization of Information and Communication Technology (ICT) for learning and educational activities [3][4]. For more information regarding internet access used by the Indonesian population.

Based on data from KOMINFO (Ministry of Information) of the Republic of Indonesia, the Digital Literacy Index in 2020 was at 3.46 [2]. The Digital Skill pillar scored 3.34, Digital Culture scored 3.55, Digital Ethics scored 3.72, and Digital Safety scored 3.24. Although this comparison is not perfect, it can be seen that the Digital Literacy Index in 2021 has improved compared to the Digital Literacy Index in 2020 [2]. The Digital Culture pillar experienced the highest increase, reaching 3.90 from its previous score of 3.55. The increasing digital activities within society demand that the Indonesian education system adapt quickly. This necessitates the support of competent stakeholders in the education sector through adequate competencies and certifications [5].

The AQF (Australian Qualifications Framework) and KKNI (National Qualifications Framework of Indonesia) are two qualification frameworks used by their respective countries to regulate education and training systems. AQF is the qualification framework used in Australia. It outlines the structure and levels of qualifications in

Australia, ranging from lower-level qualifications like certificates to higher-level qualifications like doctoral degrees [6]. AQF provides a framework for the recognition and comparison of qualifications in Australia, as well as guidelines for the expected standards for each qualification level.

On the other hand, KKNI is the qualification framework used in Indonesia. The purpose of KKNI is to regulate a consistent and integrated national qualification system in Indonesia. KKNI covers all levels of education and training, from formal to non-formal education. KKNI also provides guidelines on the structure and levels of qualifications used in Indonesia, as well as guidance on learning, competency development, and qualification recognition [5]. Although AQF and KKNI are qualification frameworks used in different countries, they share a similar goal, which is to regulate qualification systems and provide guidelines for the expected standards at each qualification level. Additionally, AQF, as one of the references for KKNI, has evolved to meet the needs of the era of the Fourth Industrial Revolution.

In mid-2020, the Australian government officially launched the draft "Foundation Skills for Your Future Skills," which includes digital literacy as one of the skills [7]. AQF has standardized digital literacy as one of the foundation skills that teachers must possess. Therefore, in this research, it is necessary to develop competency standards adapted from AQF by adding digital literacy as part of KKNI that teachers should have. This will enable teachers in Indonesia to be better prepared to face the changes and shifts brought about by the Fourth Industrial Revolution.

The research question in this study examines the condition of digital competency among TVET (Technical and Vocational Education and Training) teachers in Indonesia and the digital competencies standardized by AQF (Australian Qualifications Framework).

2. METHODS

The method used in this study is qualitative research, utilizing Focus Group Discussions (FGDs) as the approach for data collection. The FGDs were attended by experts in digital learning, vocational school teachers from various fields of expertise in West Java, and lecturers who have obtained training certificates in TVET from Australia based on AQF standards. The collected data were then processed and validated through triangulation using secondary data. Additionally, the study was enriched by the findings of a Systematic Literature Review (SLR) conducted in a previous paper on the same research topic, specifically focusing on the digital competencies of TVET teachers in Indonesia based on AQF standards.

3. RESULT AND DISCUSSION

3.1. Digital Education in Australian Qualification Framework

To understand the context and the benchmark used in this study, it is important to comprehend the Australian Qualification Framework (AFQ) first. The Australian Qualification Framework (AQF) is a national qualifications system of Australia that cover qualifications from secondary to tertiary education and vocational training [8]. The AQF is a system designed to ensure that nationally awarded qualifications are consistent and recognized throughout Australia. The AQF has 10 levels, and each level is defined by a set of learning outcomes that students must achieve after completing a qualification at that level [8].

Table 1. Level and Qualification Type in AQF

Level	Qualification Type
Level 1	Certificate I
Level 2	Certificate II
Level 3	Certificate III
Level 4	Certificate IV
Level 5	Diploma
Level 6	Advanced Diploma Associate Degree
Level 7	Bachelor Degree
Level 8	Bachelor Honours Degree Graduate Certificate Graduate Diploma
Level 9	Masters Degree
Level 10	Doctoral Degree

AQF also determines qualification levels based on the complexity, skills, and application of knowledge and skills required to achieve these qualifications. This allows for the recognition of prior learning and also facilitates credit transfer between different education and training providers. Overall, the AQF provides a framework for the development of qualifications that are relevant, flexible, and transferable between industries and professions, and which can support lifelong learning and career development [9].

In this context, the qualification in question is the Graduate Certificate in Digital Education, which falls at level 8 in the AQF. Cited from the government training official website, TAE80316 Graduate Certificate in Digital Education is a qualification that *"reflects the roles of individuals who apply substantial specialised skills and knowledge in the field of education and capability development, using ICT. In these roles they make high-level, independent judgements in major planning, design, operational and educational outcomes within highly varied and specialised contexts. The*

qualification is designed to enhance, but not replace, a teaching or training qualification. The volume of learning of a Graduate Certificate in Digital Education is typically six months to one year."

There are eight units available for this qualification, which are divided into core and elective units. To obtain this qualification, the applicant must complete all three core units and two elective units, each from groups A and B. The units are as follows:

Table 2. Units in Digital Education Qualifications

Core Units	
TAEDEL801	Evaluate, implement and use ICT-based educational platforms
TAEDEL802	Use e-learning with social media
TAELED801	Design pedagogy for e-learning
Elective Units Group A	
TAEASS801	Analyse, implement and evaluate e-assessment
TAELED803	Implement improved learning practice
Elective Units Group B	
BSBRES801	Initiate and lead applied research
ICTICT805	Direct ICT procurement
TAELED804	Review enterprise e-learning systems and solutions implementation

Based on the qualification, it is clear that the graduate certificate in digital education set a standard on how TVET teachers are considered highly skilled digitally in learning and teaching environment. Teachers are not only required to apply their digital skills in teaching and learning, but they also need to have the competency to determine best suited digital platform, e-learning media, and e-assessment. Teachers who are involved in ICT procurement also have an advantage as they are more likely to be proficient users and highly skilled in managing the ICT-based learning support in their educational institutions.

3.2. Digital Competence of Indonesian TVET Teachers

Digital competency is considered a must in almost all educational institutions [10]. It becomes a requirement to keep up with Industrial Revolution 4.0 demands. However, many factors can influence how TVET teachers perform digitally, including internet coverage, digital fluency, availability of required devices, and the acceptance of new technology [11] [12] [13]. In Indonesia, digital proficiency among teachers is highly disparaged due to the inequality of technology reach, especially in rural areas.

Digital literacy in vocational education is not a new concept, but recently the urgency has been growing. The FGD informant who was also a nationally recognized IT expert has pitched in his view according to his research about the digital literacy of vocational school teachers in West Java. It is found that among 267 vocational teachers, many still have problems related to digital literacy [14]. Based on the theory developed by Majumdar [15], there are 4 (four) levels of digital literacy: (1) Emerging, at this stage schools/teachers are just starting digital exploration (just buying equipment, hardware, and software, just holding training, etc.); (2) Apply, at this stage, there is already an understanding of the contribution of ICT to school management, at this level schools have started using or integrating ICT in school management and adopting ICT in the curriculum; (3) Infusion, at this level there is the integration of ICT in the curriculum and the use of technology is better; (4) Transforming. At this level, ICT becomes an integral part of the personality for both teachers and students (helping the learning process), there is integrated learning (student-centred learning and in accordance with the real world).

In this research, the digital literacy level of TVET teachers in West Java was still at the Apply stage (level 2). It shows that there is a need to improve ICT facilities and infrastructure in each school to support digital literacy activities. The results of the study also showed that the use of animation and video editing applications was still low. There are several factors that cause it, among others, the age factor might affect digital literacy skills, but gender does not affect it (no gender bias). In the working age range, the older (> 50 years) digital literacy skills decrease [11][12]. In the aspect of learning in class, it was found that 46% of teachers in West Java were still unable to integrate ICT into learning. The ability to make instructional media still needs to be upgraded by various trainings which also can contribute the confidence level in using technology.

In regards to the TVET context, the condition can be even more challenging. Vocational High Schools (SMK) are currently still considered as an alternative schools for their children or as a school for the lower middle-class community. However, vocational schools or vocational schools are far more expensive than public schools (SMA). Practicum fees for vocational/vocational schools require materials and equipment that are not cheap. To ensure that SMK students get good learning in theory, especially in practice, it requires the competence of teachers who are pedagogically prepared and technically competent in their respective fields.

Vocational High School graduates are prepared to become operator-level skilled workers who are able to fill

jobs in every vocational field. However, until now, the ability of teachers, especially teachers of practical subjects, is still not optimal, and even still does not meet TVET teacher standards. For this reason, regular and sustainable upgrading and upskills are needed to improve and strengthen the teacher's learning experience. In several aspects, the lack of ability/competence of vocational school teachers is more due to the mindset and behaviour of teachers who are partly reluctant to learn new things, especially regarding digital technology. On the other hand, there are quite a lot of training facilities both online and offline that teachers can access if they want to improve their competence.

3.3. Initiating the Adaptation of Digital Education for TVET Teachers in Indonesian National Qualification Framework (KKNI)

The stages or levels of digital literacy can be adopted from various sources. In addition to the digital competence itself, we must also focus on developing attitudes or values and opening the mindset and mental blocks that digital literacy is important. Thus, standards related to teachers' competency must also exist. It can be adopted from certification provided by the National Qualification and Profession Board (BNSP), professional organizations, and related TVET institutions. It also can be in the form of a recommendation to the government. One of which is by providing a MOOC (Massive Open Online Course) to hold open training.

Aside from platform support, there must be a systematic program that supports the improvement of TVET teachers' digital skills. There are two ways of connecting IT or digitization with curriculum or teachers:

Direct, how digital is positioned as material that must be mastered by teachers (and students) as standard content. Which can then be raised as a course/subject. At UPI, almost all study programs have substance or courses related to IT (ICT Literacy and Learning Media, etc.). Because one of the pillars is that IT is a competency that must be mastered. Another example is in the 2004 curriculum, which brought up ICT subjects.

Indirect, how digital is infused or integrated in other subjects or subjects. At UPI, all 168 study programs have touched on IT. Now the term digital pedagogy is widely known.

In formulating standards, digital competency standards for informatics teachers must be distinguished from full digital competency standards. To view competence, a broader perspective is needed. Learning content in the 21st century must fulfil 3 parts, namely: (1) Foundation Knowledge (to know) => Digital / ICT Literacy, Cross-Disciplinary Knowledge; (2) Meta Knowledge (to act) => Creativity & Innovation, Problem-solving & critical thinking, Communication & Collaboration; (3) Humanistic Knowledge (to value) => Life/Job Skills, Ethical Awareness, Cultural Competence. Teacher qualification and competency standards as regulated in the Regulation of Education Ministry No. 16 year 2007 already explicitly allude to digital literacy even though it is mentioned with different terms.

In the context of the digital competence of vocational teachers, there are several areas that should be considered as a part of the competency standards, which are:

Technological Mastery: TVET teachers must have an understanding and practical skills in using hardware (eg computer, laptops, tablets) and software relevant to their field of study. This includes knowledge of operating systems, productivity applications, and digital learning tools.

Use of Educational Devices and Applications: SMK teachers must be able to integrate educational devices and applications in their learning. This includes an understanding of computer-based learning applications, online learning platforms, collaboration tools, and interactive learning media.

Digital Literacy: SMK teachers must be able to use digital technology with an understanding of digital ethics, privacy, security, and handling information responsibly. They must also have the ability to evaluate and use digital resources appropriately in a learning context.

Online Learning (e-Learning): SMK teachers need to understand online learning methods and strategies. They must be able to develop digital learning materials, and design activities

3.4. The Mapping of Digital Education Training Package

The AQF competency standards are very dynamic and responsive to ever-growing challenges so the standards for each level can change in a matter of one year. It means that in just a few years, a qualification can be superseded if it is no longer relevant to the industry's demands.

As with other qualifications in AQF, TAE80316 Graduate Certificate in Digital Education also has the possibility to be changed, both in the composition of the competency units, qualification levels in AQF, qualification requirements, and performance criteria as a reference for evaluating qualifications. This flexibility must also be possessed by the TAE80316 Graduate Certificate in Digital Education qualification which was adopted by the AQF through periodic reviews. This needs to be done to ensure digital education qualifications are in accordance with the conditions and needs of teachers in Indonesia.

In the qualification framework of AQF, the term cohort is also known which describes the schemes of

certification. A cohort is intended to accommodate the different needs and abilities of qualifying participants. Sometimes, many qualification participants have experience and expertise in a particular competency unit but do not have formal education or certification in that field. To facilitate the certification process for participants, recognition of prior learning (RPL) is applied to certain units. Thus, participants do not need to take part in a series of trainings for all competency units to obtain certain certifications and it is sufficient to provide evidence documents for the RPL so that the certification process can be shorter and easier.

The Indonesian National Work Competency Standards (SKKNI) which have been implemented in Indonesia so far have mostly adopted standards from AQF. For this reason, in digital education competence, it is very possible to be adopted again or as a reference in determining standards in SKKNI.

Digital education is an absolute necessity for all 21st-century teachers, but its implementation requires adjustments according to the teacher's conditions. Based on the research results, it can be identified that teachers who need certification have different initial abilities, backgrounds, and experiences in using ICT in learning.

Likewise, the mastery of ICT for each teacher is different. The causes of differences in digital competence and implementation in the classroom also vary, one of which is gender, age [16] [17], attitudes toward technology [16][18], experience [17], education level [17], facilities [16][18], and environment [18]. Even so, digital competence is a skill that must be mastered by teachers in the era of the industrial revolution 4.0, so a scheme is needed that suits the needs of teachers.

This diversity then gave birth to various qualification cohorts/groups. The design of the educational qualification cohort mapping can be seen in Table 3 and Figure 1.

Table 3 Cohort Mapping in Digital Education

	Group A	**Group B**	**Group C**	**Group D**
Core Units				
TAEDEL801	training	RPL	RPL	RPL
TAEDEL802	Training	Training	RPL	RPL
TAELED801	training	Training	RPL	RPL
Elective Units A				
TAEASS801	training	RPL*	RPL*	RPL*
TAELED803	training	RPL	RPL	RPL*
Elective Units B				
BSBRES801	training	RPL*	RPL*	RPL*
ICTICT805	training			RPL*
TAELED804	training		RPL*	RPL*

Based on the results of this study, it can be concluded that there are four major groups for this qualification, namely novice teachers (Group A), experienced teachers without an ICT background (Group B), experienced teachers with an ICT background (Group C), as well as experienced teachers involved in school management (Group D). Every individual who wants to get this qualification must have formal qualifications in the field of education, be it a bachelor of education or a teacher who has taken professional teaching education. This is because the eighth level qualification level equivalent to a master's degree is required to have qualified pedagogic competence. The classification of this group can be done using the self-assessment instrument that will be developed in further study. The flowchart of the cohort scheme can be seen in figure 1.

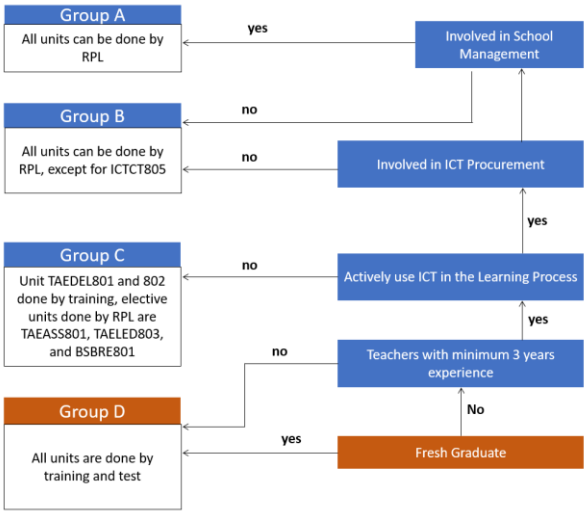

Figure 1. Flowchart of the Cohort Scheme

4. CONCLUSION

Digital education is a competency required for TVET teachers in the 21st century which became a necessity to be standardized. As Indonesia National Qualification Framework (KKNI) was formulated based on Australian Qualification Framework (AQF), the digital education qualification in AQF which previously has not been regulated in Indonesia, can be adapted into KKNI. However, to achieve a comprehensive and contextualized qualification standard, the current condition of Indonesian TVET teachers should be taken into consideration. The steps taken to improve teachers' digital competence should be based on the available resources and the existing skills of each teacher, which

determine the starting point and the scheme teachers have to take to obtain digital education qualification.

AUTHORS' CONTRIBUTIONS

VD and ARS contributed to the making of the instruments, organizing the data collection, and in the publication writing. LW contributed to leading the FGD and analyzing the data. JM contributed to providing experts and informants in the research.

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