

Up-Skilling and Re-Skilling Teachers' on Vocational High School with Industry Need

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ABSTRACT

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The development era demands the skills of teachers to meet needs and adjust. This means that the teacher's ability to upgrade is needed. The objectives of this study were (1) to determine the up-skilling that must be done by vocational school teachers with world-standard work era 4.0; and (2) knowing the concrete steps that must be taken by vocational school's teachers in re-skilling the world-standard work era 4.0. This research using qualitative with case study approach. The technique of determining participants using purposive sampling. Participants in this study were vocational school teachers, vocational school's service branches, and widyaiswara. Data collection techniques using structured interviews by preparing interview guidelines. Data analysis using Creswell case study data analysis model, namely (1) data management; (2) memoing; (3) exposure; (4) classification; and (5) interpretation. Data analysis in the study was carried out with the assistance of Software Altas.ti version 8 for windows. The results of this study are (1) up-skilling of industrial standard vocational school teachers in the era of 4.0 needs to be done with three components, namely (a) develop new skills; (b) time-to-hire; (c) competency assessment. Meanwhile, (2) re-skilling of vocational

school's teachers with industrial standard era 4.0 consists of three components, namely (a) intelligent digital tools; (b) create new tasks and occupations; and (c) coaching programs. This implication can be used for widyaiswara in providing training to vocational school teachers.

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Introduction

The development of the era requires qualified competences for vocational school teachers to be able to deal with it. They can change human behavior in interacting with the environment (Sholekah & Mahmudah, 2020). The real form that needs to be done is to improve skills. This requires support from schools (Muhyadi & Mahmudah, 2013). In achieving school goals, it requires qualified, competency, and qualified skills for teachers. In this regard, teachers are expected to be able to develop themselves through trainings that are relevant to their field skills. Teaching abilities are essentially specific talents in terms of features of the execution of learning activities that must be owned and implemented by anybody who works as a teacher, tutor, trainer, or facilitator in the learning process (Mahmudah et al., 2017). Skills are the basis for the development of knowledge and readiness for vocational school graduates based on the industrial needs (Mahmudah & Santosa, 2021).

Digitalization is part of the industrial revolution 4.0. Therefore, the policies and strategies designed by the government will cover digital as well as aspects such as robotization, artificial intelligence, and the ability of teachers to utilize technology in learning. Teaching skills are essentially special capabilities in terms of aspects of learning activity execution that anybody who works as a teacher, tutor, trainer, or facilitator in the learning process must own and execute (World Economic Forum, 2020). The industrial needs are a transformation of the changing types and nature of work. Therefore, it also requires a rapid change in the types of skills needed by teachers and is developed through learning materials for students. So that requires curriculum development. In this case the government also gives freedom to vocational schools to adjust the conditions and characteristics of students. On this basis, the curriculum can be used as self-potential development (Hasbi & Mahmudah, 2020).

Improving teacher skills is a skill opportunity that needs to be targeted. In vocational high schools, synchronization must be established in teaching and learning activities. (Suhendar et.al, 2020). This aims to re-create and or improve work capabilities according to the needs of the 4.0 era

including automation and other technologies. Teachers who already have skills need up-skilling to find out what the industry wants. Meanwhile, teachers who do not have skills need re-skilling to have abilities like the needs of the current. Up-skilling and re-skilling are an important part of improving the quality of teachers and the quality of practical learning for vocational school students in accordance with the industrial needs.

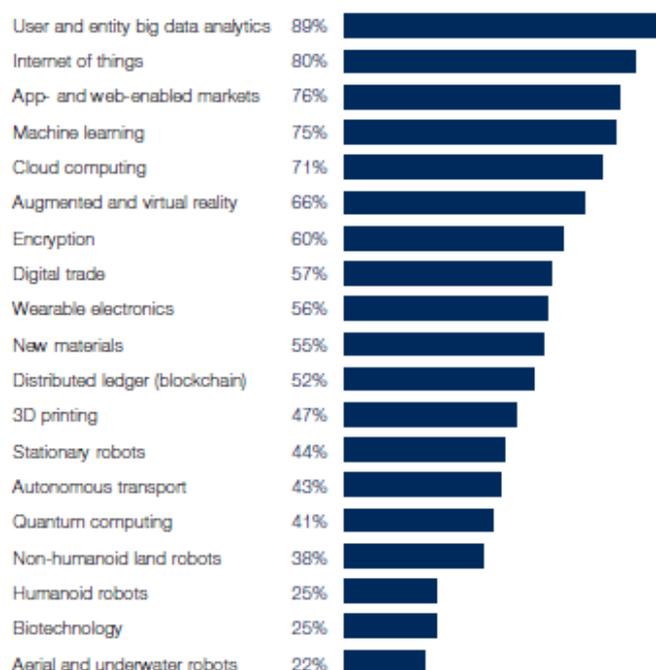


Fig 1: Planned Technology Adoption

Source: Future of Jobs Report 2018

Figure 1 above can be interpreted that the latest skill that teachers need to do is digital automation. The survey, conducted in 2018, addresses today's challenges. The adoption of this renewable technology can be carried out in any industry. So that the teacher must be able to provide learning to students so that in the end students are not surprised in operating the equipment at the completion of work in industry. Based on the background of the problems above, The purpose of this research is to (1) determine the existing state of affairs in up-skilling that must be done by vocational teachers with world-standard work.; and (2) knowing the concrete steps that must be taken by SMK teachers in re-skilling the world-standard work.

Method

Research Design

This study took a qualitative approach using a case study methodology. The purpose of utilizing

a case study technique is to show the significance of what SMK instructors must do to improve skills and competencies in the industry 4.0 age. Creswell & Creswell (2018) a case study is defined as “researcher explores in depth a program, an event, an activity, a process, or one or more individuals” (p. 15). This research included vocational teachers as participants. Purposive sampling is a method of determining participation. Participants in this study were teachers, vice principals in the field of curriculum, Kacabdin, widyaiswara.

Data Collection

This study uses data collection techniques using structured interviews. Interviews were conducted using interview guidelines related to up-skilling and re-skilling of vocational teachers.

Table 1. Interview Guide

Big-Question	Question
How to Up-Skilling Industrial Standard Vocational School Teachers in the Era 4.0?	<ul style="list-style-type: none"> • What steps need to be taken in developing vocational teacher skills? • How can planning time for SMK teachers develop skills? • Is a competency assessment necessary?
How to Re-Skilling the Teachers of vocational school Industrial Standard in Era 4.0?	<ul style="list-style-type: none"> • What skills should be given to teachers in this development era? • Is it necessary to make a list of occupations suitable for industrial development in the era of 4.0? • How is the planning for the implementation of training for SMK teachers with industrial standard in the era of 4.0?

Data Analysis

Interviews in this study were conducted on 2-4 November 2020. The validity of the data using trustworthiness. Data analysis using a case study model Creswell & Creswell (2018) and the techniques used for data analysis using the Atlas.ti software version 8.

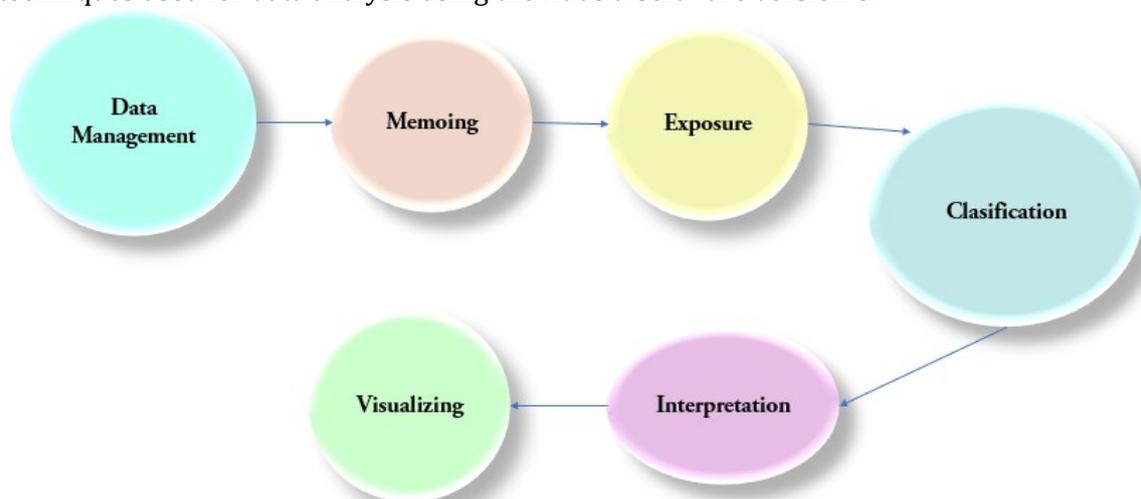


Fig 2: Case Study Analysis Model (Creswell & Creswell, 2018)

The data analysis procedure in this study based on the case study analysis model above can be described as follows: (1) Data management; This procedure begins with compiling a research plan, determining research subjects, compiling interview guidelines that will be carried out to vocational teachers related to up-and-re-skilling, determining an interview schedule, conducting open and structured interviews, after the interview is complete the researcher compiles the interview transcript. verbatim, then analyze the research data using software assisted by Atlas.ti version 8 (Mahmudah, 2021). Step (2) is the researcher makes a memo on the research data that is deemed necessary to affix a memo; Furthermore (3) presentation, in this section the researcher describes the results of the analysis as material for classification. Step (4) Classification, this makes a classification of the data that has been analyzed to serve as a concept map of the research. The next step is (5) Interpretation, this is done to interpret the concept map from the research that has been done. The final step is (6) Visualizing, in which the researcher represents the data and information that the readers will provide.

Result and Discussion

Up-Skilling

The findings from the interviews were recorded using a recorder and then transcribed verbatim. This is done with the aim of obtaining data that are ready to be analyzed using software. Field data related to vocational skills development according to participant Guci/1/W states that:

"In my opinion, Ma'am, the development of these skills is very important, you know, for vocational school teachers, especially for those who are older (um ...) who can no longer touch technology. And that, what is it (aaaa ...) nowadays teaching a sophisticated physical one if possible. Continue not to be monotonous so that all the vocational students are not bored and sleepy. What does it mean? The answer to question one is yes Ma'am that it is important for the development of SMK teachers. yes what needs to be done is that the school fully supports the development of the skills of its teachers. Allowing the teacher to add skills. Not just "let's develop, our teachers, can take part in training here and there" but it is not fully supported. The same".

The same statement regarding the need for vocational teacher skills development was conveyed by participants of Diban/2/W, that:

"So, miss, in my opinion, the development of teacher skills can be done in two ways, the first is by being encouraged by the teacher himself, he has a serious willingness to develop himself. And the second is the opportunity. Any chance".

Wayad / 3 / W also provided data support from skills development, saying:

"The steps to develop teacher skills are by means of the teacher himself identifying his own needs in an institution, in this case SMK. Usually they will do things that are relevant to the skills they already have. Plus also according to the needs of the era".

In addition to the development of skills that teachers need to do in the current 4.0 era, it is self-management. Self-management is the best planning that teachers need to do wherever they are. Including planning. This is very much needed to be able to go through the jobs given as a teacher, teaching, completing school administration, and developing yourself. This statement is supported by Guci / 1 / W, Diban / 2 / W, and Wayad / 3 / W. The three participants explained the importance of planning for self-development. Because the best that teachers need to pay attention to is when the teachers have future skills. This means that teachers have skills that are not needed and will be needed in welcoming the development of the 4.0 era.

At the end of the activity, ideally schools as educational institutions that support the development of teacher skills have measurement tools. The measuring instrument is in the form of points that can show data on the level of teacher competence that has been carried out through the training that has been followed. This is like the statement from Guci / 1 / W, which says that:

"I think it is necessary to make an assessment for teachers who have attended training or conducted training in skills development independently. This is used to measure the extent to which the teacher's competence has increased".

Diban / 2 / W also stated that:

"Assessment is used to measure teachers in improving skills and competencies so this is indeed needed for any teacher in self-development through training".

The same statement was also made by Wayad / 3 / W, that:

"The end result of self-development by improving skills can be done by testing self-efficacy through prepared assessments. In my opinion, Ma'am (aaaa) that can be used as a consideration for the progress of teachers after participating in training or skills improvement".

The data that had been transcribed were then analyzed using atlas.ti version 8. The analysis carried out included memoing, presentation, and classification such as a case study model. (Creswell & Creswell, 2018). The results of software assisted qualitative data analysis can be seen in Figure 3.

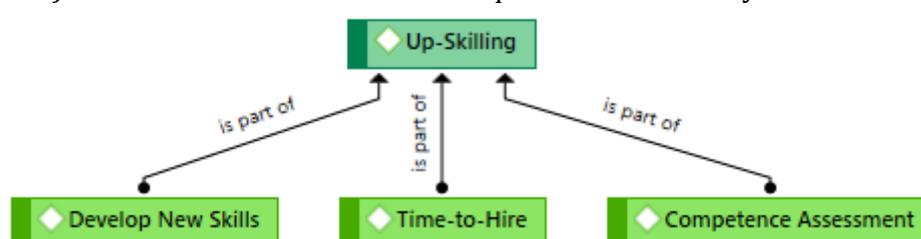


Fig 3: The Results of Up-Skilling Analysis for Vocational School Teachers

Figure 3 the above is the finding of the results of analysis and research related to the up-skilling of SMK teachers. Based on the figure, there are three components of up-skilling vocational school teachers, which include: (1) developing new skills; (2) time-to-hire; (3) competence assessment. The three components of the findings from this study will then be discussed as follows:

Develop New Skills

The development of new skills for vocational teachers is a major part of the involvement of vocational teachers in the changing era and the latest technological developments. New skills from the results of this study are skills that support and are used in completing work either using sophisticated equipment, operating systems, and or creating designs. According to Yeoman & Zamorski (2008) develop new skills is fundamental skills for teacher. This statement was also corroborated by Tank (2015) that develop new skill include of communicative language, computing skills, leadership skills, and goal setting. Likewise conveyed by Commission (2010) say that development new skills of teachers' as well as strengthening education and training institutions to better meet the demands of the economy and society. The same thing was also conveyed by Diamond (2018) that teachers require a diverse choice of professional development options that allow them to widen their horizons while also strengthening their knowledge and skills. grouped misleadingly according to the qualification level they have achieved.

Based on the above definitions, it can be concluded that vocational teachers should ideally be able to develop new skills. It aims to be able to create something new and also to anticipate technological lags in career development in teaching. Vocational teachers need to develop new skills because having adequate competencies will certainly be better able to provide students with the current experience and knowledge needed. Especially vocational teachers who teach practice. One of the goals of vocational teachers to develop new skills is to increase competencies and qualifications in the field of education.

Time-to-Hire

Time-to-hire, if converted into human resource development, is the time it takes for teachers to do up-skilling. This time is needed to upgrade teacher skills to a more up-to-date process. Usually this term is used in recruitment and selection. It's just that this study found a new topic related to time-to-hire which is very important in improving the skills of vocational teachers. According to Prasad et al., (2019) time-to-hire can help hiring teacher to increase the skills. The same thing was conveyed by Gusdorf (2008) that an agency would develop an application pool and conduct preliminary interviews based on job criteria supplied by your company, weeding out unqualified individuals and delivering you only those who are truly qualified. This can help you save a lot of time. The same opinion was also conveyed by Bendick & Nunes (2012) such cognitive and organizational processes, of course, can lead to skewed outcomes in post-hiring teaching activities like performance reviews, promotions, increases, and terminations. So is Chamberlain (2015) says that teacher recruiting practices can have a significant impact on the length of the interview process. Including group panel interviews, applicant presentations, background checks, skills tests, and other requirements in the recruiting process has a positive and statistically significant impact on hiring timeframes.

Competence Assessment

Competence assessment for vocational teachers is important. Assessment is concrete steps to measure the level of competency of vocational teachers (Cahyono et al., 2021). The need for this competence assessment is used as a reference and consideration for the principal to be able to assess the appropriateness of the competencies possessed by each teacher. This is a necessity for managerial talents in schools. In addition to identifying competencies, assessment results can also be used to formulate and map teacher competency development programs that are in line with the development of the 4.0 era. One of the assessments that need to be carried out to measure the competence of vocational teachers is to be carried out in the classroom. This concurs with Drisko (2018) that use classroom assignments or tests of knowledge as another part of competency assessment. Zlatkin et al., (2017) that competence orientation necessitates new measures being

implemented at various levels and in many areas of practice. Also according to Miguel et al., (2018) states that The most significant element in what and how students choose to study is competence evaluation, and the quality of their learning outcomes is determined by the type of assessment they get.

Re-Skilling

Various data from the field through interviews were recorded using a recording device, then transcribed verbatim. After the transcript data was available, then it was analyzed using software. The data in the field revealed skills that had to be developed in the 4.0 era, the latest occupation, and planning for training implementation. Re-skilling is needed for teachers who will provide learning to vocational students in practice. This means that teachers are required to master skills in accordance with the development of the 4.0 era. This was conveyed by Guci / 1 / W which stated that:

"I think the skill that teachers need to develop in this era of 4.0 is the ability to operate digitally. Teachers who are insensitive and do not know how to operate a tool means that their abilities need to be improved".

Diban / 2 / W also expressed the same opinion, that:

"In this era, if you don't understand how to use sophisticated tools, it means that the teacher is not ready to provide learning to vocational students. The real demand of this 4.0 development is that teachers are able to provide knowledge, yes, if there are no adequate tools in school that can be used for practice. And also the skills to students when there is adequate equipment and can be used for learning models.

The skills of vocational teachers in the era of 4.0 are really needed. Likewise, the learning provided is not monotonous and unconventional. This means that there are learning innovations that can be improved by the teacher. Wayad / 3 / W also stated that:

"Vocational teachers must be able to upgrade themselves to have skills according to the 4.0 era. Not only knowing but also being able and willing to use it".

To support the fulfillment of skills that need to be done by vocational teachers, it is necessary to make a list of existing occupations in accordance with their respective vocational expertise. So that it can adjust to the industrial development in the 4.0 era. This is as stated by Guci / 1 / W, which states that:

"The occupational map of each field of expertise in the vocational field, in my opinion, needs to be made according to the industrial standards of the 4.0 era. This is related to the link and match needed by vocational teachers in improving competence and teaching it to students in schools.

This statement is supported by Diban / 2 / W, which states that:

"There needs to be a joint study related to occupational developments in accordance with industry 4.0 standards. Occupation is the main point for schools to be able to determine new developing tasks. Likewise with the growing occupations. This, in my opinion, aims to understand the current conditions and answer the challenges of the 4.0 era or global era.

Based on the data above, then processed with the help of software. The results of the analysis can be seen in Figure 4.

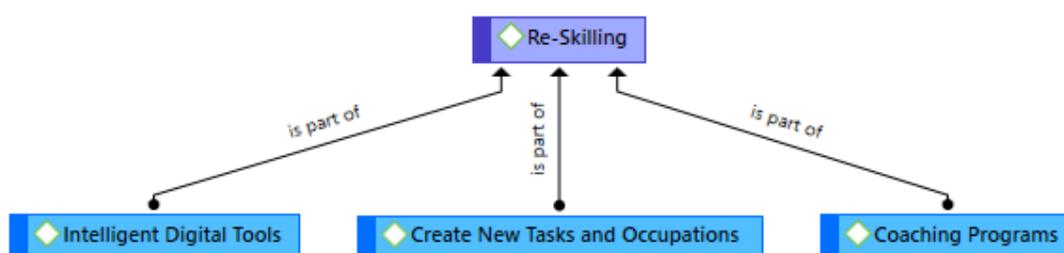


Fig 4: Results of Re-Skilling Analysis of Vocational Teachers

Based on figure 4, there are three main findings from this study regarding vocational teacher re-skilling, namely: (1) intelligent digital tools; (2) create new tasks and occupations; and (3) coaching programs. Each of the above findings can be discussed as follows:

Intelligent Digital Tools

The technological capabilities of the development of the 4.0 era are marked by the need for capable and skilled teachers in operations. This means that teachers are not only connoisseurs of technology but also users who can provide appropriate learning to vocational students. The concept of intelligent digital tools is one of the important things for teachers in providing learning in the 4.0 era. According to Wang et al., (2017) states that digital intelligence seems to be guiding for the application into the school environment. The same thing was conveyed by Kumar et al., (2016) states digital technologies have fundamentally changed the way of teaching and learning. This statement is supported by Griffiths & Forcier (2016) which states that digital intelligent tools that adjusts teaching and learning techniques and materials to individual learners' abilities and requirements. Also a statement from Adams (2010) that enhance our capacity to design successful methods to fit this new intellectual style by acknowledging digital intelligence and all of the consequences this acknowledgment may have for education and communication. Also according Suhendar et.al (2020) that intelligent digital tools have utilization to use the performance assessments, self-assessments, portfolio assessments, daily assessments, midterm assessments,

end-of-semester assessments, competency level examinations, and school exams are all evaluation tasks that instructors must do.

The various statements that have been conveyed above can be concluded that vocational teachers are the basis for the progress of learning in the 4.0 era. This is in line with the development of the era. Where, teachers are required to understand how to provide material by utilizing the latest technology to students. Especially in practical learning in vocational schools. Teachers who have high abilities towards technological sophistication will better understand how to provide understanding, character, skills, and attitudes to students in the 4.0 era. The digital era is a tool that can be used for convenience in learning which eventually becomes an increase in knowledge, thinking power, and vocational school students graduate with computational thinking in all aspects of work.

Create New Tasks and Occupations

One of the indicators in the development of re-skilling for vocational school teachers is the creation of new tasks and occupations. The main objective of this needs to be done is to make a list of tasks and occupations that are right for vocational school students in harmony with industrial developments in the era 4.0. tasks and occupations are real work that needs to be developed for vocational school teachers to find out and identify the materials needed in providing material and learning in class and during practice. According to Tasks et al., (2013) that the task and occupations method has been used in a number of recent research projects. Likewise according to Mattijssen & Smits (2020) that jobs requiring a high level of expertise have more steady employment prospects. The statement supported by Bisello et al., (2018) that The task content of professions is always changing as new manufacturing technology and work organization models are introduced.

The most crucial factor is about vocational high schools is to have a flexible curriculum in accordance with industrial developments in the 4.0 era. A rigid curriculum will be very detrimental to graduates who do not have the capacity to work. The curriculum is the main part of being able to list new tasks and occupations in accordance with what is needed in the 4.0 era industry. Hence the importance of teachers in re-skilling considering the needs of the industry. This means that the tasks and occupations that are the basis for training are appropriate and based on the development needs of the 4.0 era. So that students are able to learn the characteristics of the job. And don't be surprised when it comes to work.

Coaching Programs

Coaching programs can help teachers re-skilling. This coaching program can also be a reference for teachers to adjust the skills to be trained. This adjustment is expected to be able to motivate teachers to continue improving skills. Basically, the coaching program is one of the activities that

can support vocational school teachers in self-development. We have found the framework's focus on solutions to be extremely useful in the workplace, as it is oriented on the development of human strengths and goal accomplishment rather than issue diagnosis or analysis (Grant & Hartley, 2013a). The same statement Josefina et al., (2020) that a coaching program is one of the most effective leadership styles, and that its primary goal is to enhance employees' personal resources. Grant & Hartley (2013b) Skills coaching focuses on the development of a certain skill set, such as enhancing communication, sales, or practicing for presentations or negotiations. This type of coaching frequently necessitates the coach focusing on specific behaviors, and the coaching sessions may be lengthy. The coaching program is one of the agendas that teachers need to do for re-skilling.

Conclusion

It may be inferred, based on the findings of the data analysis and discussion, that the industrial standard teacher up-skilling and re-skilling of the era 4.0 needs to be developed and improved. Up-skilling teachers in this study found three components, namely (a) developing new skills; (b) time-to-hire; and (c) competency assessment. Meanwhile, the findings from re-skilling teachers that need to be done include three things, namely (a) intelligent digital tools; (b) create new tasks and occupations; and (c) coaching programs.

On the basis of the results of this research, there are suggestions aimed at the vocational school service branches to be able to create a legal umbrella between vocational school and Industry in order to make programs in the development of vocational teacher skills. A more concrete suggestion is for widyaiswara, namely to be more intense in developing a training curriculum for vocational teachers in accordance with industrial standards in the 4.0 era. As well as suggestions for vocational school teachers are to be able to recognize self-abilities and improve skills according to the industrial needs of the 4.0 era.

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