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Determining the Job Readiness of Vocational Graduates in the Industrial Revolution 4.0 Era: Perspectives Academics & Practitioners

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ABSTRACT

The work readiness of vocational graduates is crucial for realizing Independent Learning and Independent Campus (MBKM (acronyms in *Bahasa)). However, there are pros and cons from various parties and issues regarding the lack of readiness (competence) of vocational graduates in the 4.0 era, and few discussions about the relationship between this and MBKM. Therefore, this article aims to analyze the best practices in MBKM for the work readiness of vocational graduates in the era of the 4.0 industrial revolution by applying a quantitative survey method. The results of the study reveal that character is the dominant factor for vocational work readiness in the era of the 4.0 industrial revolution, followed by technical and non-technical competencies, with the conclusion that character and its sub-aspects, such as honesty, discipline, responsibility, hard work, a creative attitude (open to new ideas), and curiosity, are fundamental to supporting the future of vocational graduates who are able to compete globally.*

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INTRODUCTION

The curriculum is one of the numerous components or supporting variables that make education a conscious endeavor (Ni'mah & Ratnaningrum, 2023). The curriculum is a set of plans and arrangements for educational resources that can serve as a roadmap for instructional activities (Hikmah, 2020; Suastika, 2022). In the field of education, teachers and students should engage in teaching and learning activities (Herawati, 2018).

The Independent Learning-Independent Campus (MBKM (acronyms in Bahasa) was formally introduced by the Minister of Education and Culture in 2020. MBKM aims to provide students with skills and/or moral qualities that will enable Indonesian education to compete on a global scale (Syahril et al., 2023). However, every new policy is always followed by pros and cons from various existing parties (Hadi, 2020). Apart from that, MBKM has been implemented with various questions, one of which is how the best practices of MBKM in the era of the industrial revolution 4.0, several sources say that the industrial revolution 4.0 began in 2011st which was marked by a cyber-physical system or often known as the internet of things (IoT) (Yunus & Mitrohardjono, 2020). Technology and the world of education are inseparable from vocational education. Vocational education is an educational and training institution (TVET). Educational institutions related to vocational education include vocational schools (SMK (abbreviations in Bahasa)), vocational training institutions (Sudira, 2017).

The implementation of the MBKM policy in the vocational education sector requires significant allocation of financial resources and high managerial complexity in order to achieve competitiveness at

the international level. According to the Indonesian National Qualifications Framework (KKNI (abbreviations in Bahasa)), referring to educational levels from Levels 3 to 6, graduates from universities possess technical or analytical skills in their respective fields. However, to realize this, several factors must be considered to ensure students are prepared to enter the workforce, both internally and externally. Findings from Handayani (2015); Parangin-Angin et al. (2022); Santika & Mukhaiyar (2020) stated that many college graduates still lack competence or are undereducated and skilled. This is confirmed by the results of a pre-survey conducted by researchers from June 25th to July 31st, 2023rd, with several academics in Yogyakarta City. On average, academics stated that vocational graduates are not ready to enter the workforce due to several factors, including lack of confidence, curiosity or lack of desire, communication, soft skills, independence, students' mental unpreparedness, social environmental factors, and family factors.

These factors are related to the character and/or competence of students. Character is personality, a distinctive basic nature, a characteristic or quality that remains continuous and eternal and can be used as a characteristic to identify a person (Hariyanto, 2021; Samrin, 2016), whereas competence is the ability needed to do or carry out work based on knowledge, skills, values, applicable norms and work attitudes (Ibrahimova, 2023; Sutarto, 2017). These two elements should be mutually sustainable in order to create quality human resources (HR) (Suwartini, 2017). This is confirmed by the findings Budiningsih et al. (2020) which states that several companies currently require prospective employees or workers who have high character and soft skills, even if hard skills are not optimal, this is not a problem because hard skills can be developed or trained. However, the fact is that the moral crisis among students has been more dominant recently (Mubin, 2020). Thus, it becomes a big question related to the character and/or competency aspects for the work readiness of vocational graduates in the era of the industrial revolution 4.0.

Character consists of 18 sub-aspects, including 1) religious, 2) honest, 3) tolerance, 4) discipline, 5) hard work, 6) creative, 7) independent, 8) democratic, 9) curiosity, 10) national spirit, 11) love of the homeland, 12) appreciate achievement, 13) friendly/communicative, 14) love of peace, 15) like to read, 16) care for the environment, 17) care for society, 18) responsibility (Husna, 2017; Melati et al., 2021; Rahdiyanta et al., 2016). Then in terms of competency, it is divided into two, namely technical abilities and non-technical abilities (Neneng, 2021). Technical ability is an ability that an individual has and can be measured because it is practical (Sumar et al., 2020). The following are sub-aspects of technical competence: 1) ability to read technical drawings, 2) ICT skills, 3) motor skills, 4) material skills, 5) mathematical skills, 6) design and geometry skills, 7) animation and simulation skills, 8) graphic design skills, 9) analysis and evaluation skills, 10) product design skills (Fraillon et al., 2014; Najera & Osorno, 2023; Putra et al., 2015; Suryadi & Giatman, 2019; Trimurtiningrum et al., 2022; Unesco, 2018; Wiryatun, 2019). Furthermore, non-technical skills are general and basic skills that are important as a reference for someone (Dewi et al., 2017). The following are sub-aspects of non-technical competencies: 1) communication skills, 2) adaptability, 3) critical and logical thinking, 4) politeness, 5) responsibility, 6) social skills, 7) positive attitude, 8) professionalism, 9) flexibility, 10) teamwork, 11) work ethic, 12) creativity and innovation, 13) problem solving (Browne & Keeley, 1999; Cropley, 2006; Dede, 2021; DeVito, 2016; Hackman, 2011; Hmelo-Silver, 2004; Katzenbach & Smith, 2015; Montessori et al., 2023; Pierre et al., 2008; Robles, 2012; Sawyer, 2012; Siddiqui, 1988; Usdiyana et al., 2009; Widodo et al., 2012). However, what do academics and practitioners think about these aspects and sub-aspects? Which one is more dominant or important for the work readiness of vocational graduates in the era of the industrial revolution 4.0? One of the novelties of this research is the comprehensive analysis of factors related to the success of vocational graduates in the 4.0 era, particularly in the implementation of MBKM. To date, aspects related to vocational education, the 4.0 era, and MBKM have been limited and unspecified (clustered).

METHOD

This research began from August 7th to September 15th, 2023rd, and used a survey method. The data analysis technique used was quantitative descriptive. This is an approach that systematically describes, explains, and summarizes numerical data from a particular situation (Aziza, 2023). This research was conducted by randomly distributing an open-ended questionnaire in the form of a Google Form, and the research instrument has been validated by experts in the vocational field with the decision that it is suitable for use. The population in this study were academics and practitioners in the field of mechanical engineering or similar fields with accidental sampling techniques, this technique is a type of non-probability sampling in which members of the target population meet certain criteria, such as availability at a certain time or a population that is easy for researchers to reach (Indra et al., 2023). The sample criteria for this research are academics and practitioners who have completed Masters Education (S2nd (abbreviations in Bahasa)), Teacher Professional Education (PPG (abbreviations in Bahasa)), or who have participated in training and have work experience in the industrial world. With these criteria, thirteen academics and twenty-nine practitioners were found to have participated in this study. With, questions on the open questionnaire (Q): (1) *which one is more dominant or important for vocational bachelor graduates in the era of the 4.0 revolution?* (Q1); (2) *Which of the character sub-aspects is more dominant or important for vocational bachelor graduates in the era of the 4.0 revolution?* (Q2); (3) *which of the several sub-aspects of technical ability is more dominant or important for vocational bachelor graduates in the era of the 4.0 revolution?* (Q3); (4) *which of the following sub-aspects of non-technical skills for vocational graduates in the era of the 4.0 revolution is more dominant or important?* (Q4); (5) *why did you choose that question or statement based on the open questionnaire?* (Q5).

RESULTS AND DISCUSSION

RESULTS

The following are the results and discussion based on findings from the perspectives of academics and practitioners. These findings are presented as follows.

Tabel 1. Characteristics of Participants in Research

Aspects Seen	Academics	Practitioner
Last Education	PPG and S2	High School, Vocational School, Bachelor's Degree (S1 (abbreviations in Bahasa)), and Engineer Profession
Gender	2 Women and 11 Men	2 Women and 27 Men
Country of Employment	Indonesia	25 in Indonesia, 2 outside Indonesia (Japan and USA)
Field of Expertise	Mechanical Engineering, Automotive Engineering, and Welding Engineering	Technicians, Production, HRD, Supervisors, OHS, and Contractors
Years of Employment	1 year to 10 years	1 year to 5 years

Which one is More Dominant or Important for Vocational Bachelor Graduates in the Era of the 4.0 Revolution (Q1)

Tabel 2. Results of Research Participants' Answers to Question No. 1

Aspects	Academics (13)		Practitioner (29)		Total (42)
	Total	Percentage (%)	Total	Percentage (%)	Percentage (%)
Character	11	85	18	62	71%
Technical Skills	8	62	17	59	64%
Non-Technical Skills	4	31	5	17	23%

Based on the Table 2 above, it can be explained that character is the main thing that is very important for the work readiness of vocational graduates in the industrial revolution 4.0 era, with a

percentage of 85% by academics and 62% by practitioners and followed by technical abilities of 62% & 59% and non-technical abilities of 31% & 17%. So that if the total of 42 respondents is obtained, around 71% answered character, followed by technical competence of 64% and non-technical of 23%.

Answer Questions 2 to 4 (Q2 – Q4)

Tabel 3. Results of Research Participants' Answers to Questions No. 2 to 4

Aspects	Sub Aspect	Academics (13)		Practitioner (29)		Total (42)
		Total	Percentage (%)	Total	Percentage (%)	Percentage (%)
Character (Q2)	Religious	7	54	11	38	43%
	Honest	13	100	24	83	91%
	Tolerant	4	31	11	38	38%
	Disciplined	11	85	25	86	88%
	Hardworking	8	62	20	69	71%
	Creative	12	92	17	59	71%
	Independent	7	54	8	28	38%
	Democratic	4	31	7	24	26%
	Curiosity	6	46	13	45	50%
	Nationalism	3	23	9	31	29%
	Love of the homeland	4	31	8	28	29%
	Appreciates achievement	3	23	9	31	29%
	Friendly/communicative	4	31	10	34	36%
	Peace-loving	3	23	6	21	21%
	Reads fondly	4	31	6	21	23%
	Cares about the environment	5	38	11	38	41%
	Social care	5	38	10	34	38%
	Responsible	10	77	23	79	79%
Technical Skills (Q3)	Ability to read technical drawings	10	77	10	34	48%
	ICT skills	8	62	16	55	52%
	Motor skills	7	54	12	41	45%
	Material skills	4	31	12	41	40%
	Mathematical skills	4	31	12	41	38%
	Design and geometry skills	5	38	6	21	29%
	Animation and simulation skills	7	54	9	31	41%
	Graphic design skills	4	31	9	31	33%
	Analysis and evaluation skills	11	85	22	76	81%
	Product design skills	9	69	15	52	62%
Non-Technical Skills (Q4)	Communication	12	92	25	86	88%
	Adaptability	8	62	19	66	62%
	Critical and logical thinking	9	69	13	45	52%
	Politeness	9	69	14	48	55%
	Responsibility	10	77	24	83	81%
	Social skills	4	31	12	41	38%
	Positive attitude	5	38	11	38	40%
	Professionalism	10	77	20	69	71%
	Flexibility	6	46	13	45	45%
	Teamwork	8	62	17	59	60%
	Work ethic	8	62	19	66	64%
	Creativity and innovation (innovative)	8	62	20	69	67%
	Problem solving	6	46	14	48	48%

Based on the findings in Table 3, it can be described as follows in the Character aspect including (Q2): honesty 91%, discipline 88%, responsibility 79%, hard work and creativity 71%, curiosity 50%; then in the Technical Ability aspect including (Q3): analysis and evaluation ability 81%, product design ability 62%, ICT ability 52%; then in the Non-Technical Ability aspect including (Q4): communication

88%, responsibility 81%, professionalism 71%, creativity and innovation (innovative) 67%, work ethic 64%, adaptability 62%, teamwork 60%, politeness 55%, critical and logical thinking 52%.

Why Did You Answer That Question or Statement in This Open-Ended Questionnaire (Q5)

The average academic answer stated that to enter the world of work, the main thing needed is character followed by technical and non-technical skills because technical skills may be replaced by machines but the character of a worker will not be replaced, but it is better if these two things are balanced. By choosing to continue to college, it is hoped that it will have an impact on changes in both attitudes and behavior that can shape character for the better, and starting from this character they can develop the knowledge they have so they can get the abilities they and the world of work expect.

The practitioners' responses were generally similar: character is crucial in the workplace. All technical aspects can be learned gradually in the workplace. Furthermore, other important qualities that vocational graduates must possess are meticulousness, skill, integrity, responsiveness, initiative, sensitivity, foreign language skills, and decision-making skills, as these are based on their experiences in the workplace, or in other words, the workplace highly demands these qualities.

DISCUSSION

Character is fundamental, according to the analysis results, with a score of 71%. This is emphasized by Habsy et al. (2024), which reveals that character is very important in the workplace, education, and even in society. Furthermore, a person's character is formed based on repeated activities (routines), which results in the formation of personal character. This is in line with research results from Indra et al. (2023) which states that habits are important and will have implications for various aspects. Thus, it can be formulated that if character is strengthened, good things will come. According to Lickona (2012), character is related to moral concepts, moral attitudes, and moral behavior (Ma'zumi et al., 2023). This means that this character is also related to the concepts of *Etika, Akhlak, Budi pekerti, and Adab* (in Bahasa, in English see Table 4 below).

Table 4. Six aspects are related to each other

In Bahasa	In English
Karakter	Character
Budi Pekerti	Character/Ethics/Behavior/Manners
Etika	Ethics/Deontology
Adab	Manners/Courtesy/Etiquette
Moral	Moral/Morals/Morale/Morality
Akhlak	Moral/Morals/Manners/Honour

The sub-aspects of character shown in Table 4 or the six aspects can be understood as interrelated elements. Therefore, it is important to pay attention to the definition of each aspect, which is closely related to character; 1) *Etika (ethos in Greek)*, (Ethics/Deontology), a science of legitimate, just, and ethical human behavior (issues concerning human actions), which consists of descriptive and normative ethics. Descriptive ethics deals with what is permissible and what is not, while normative ethics aims to formulate ethical principles that can be accounted for in everyday life practices (Bertens, 2007; Hambali et al., 2021; Jamil, 2022); 2) *Akhlak* comes from Arabic *(jama' in Arabic)*, (Moral/Morals/Manners/Honour), which means character, behavior and nature or knowledge of good and bad in the rules between individuals both physically, mentally and spiritually (Muhrin, 2020); 3) *Budi pekerti* (Character/Ethics/Behavior/Manners), refers to human behavior measured by its goodness and badness through religious norms, law, manners and politeness, culture and customs of society (A'dlom, 2021); 4) *Adab* (Manners/Courtesy/Etiquette) emphasizes the teachings of Islam which include manners towards Allah SWT (God), towards oneself and between individuals (Permady et al.,

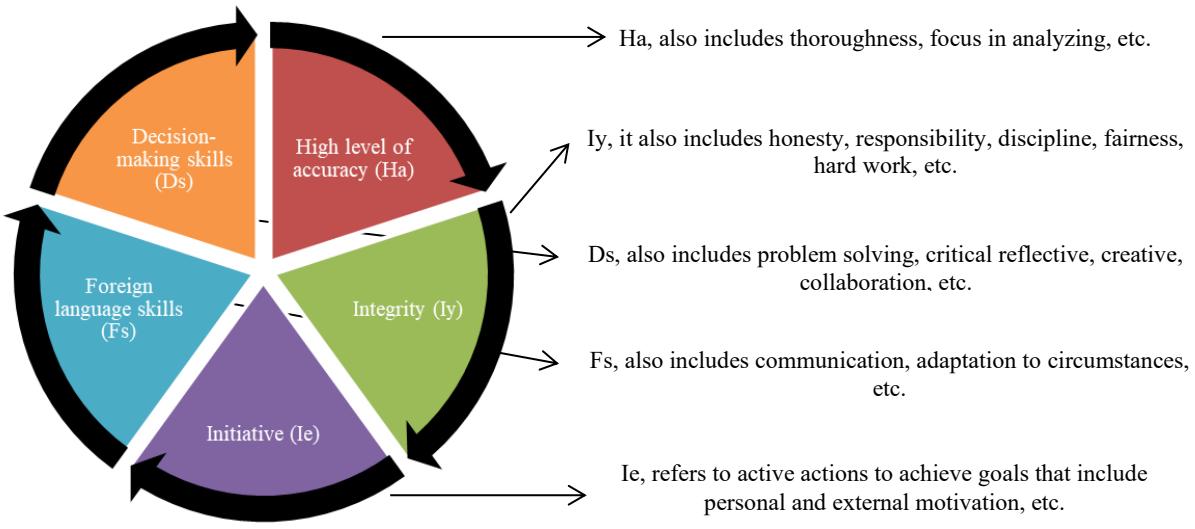
2023). With the various meanings outlined in Table 4 and their various definitions, it can be concluded that each region (country) and socio-culture has its own understanding and beliefs, but has similar concepts and goals, namely the ability to socialize by understanding and distinguishing values that are considered good and bad. In society, this covers various aspects starting from the realm of the home (family), the environment (school/university - workplace), and even broader aspects.

Technical skills, according to the analysis, scored 64%. Several informant responses referred to specific abilities or skills in the technical field, such as analysis and evaluation skills and product design skills. To gain specialized skills in a field of interest, at least some experiential knowledge is highly recommended. This can be achieved through reading, listening to advice or direction from teachers/parents, and practical work (Nuai & Nurkamiden, 2022). Apart from the methods mentioned above, there are quite a lot of other aspects that can be used as references, such as understanding one's potential, doing/taking psychological tests (Yani et al., 2022; Yulianti et al., 2024). Some descriptions related to this are knowledge that will have implications for intelligence (patterns/types of thinking). For example, Intelligence Quotient (IQ), Multiple Intelligences (MI), this is very suitable in the vocational field because this field is related to science, technology, and social (applied education), a concrete example we can take in the MI Theory, namely: logical-mathematical intelligence (LM) and visual-spatial intelligence (VS), although in fact, there are other types of intelligence but especially in the fields of technology and engineering, LM and VS intelligence tend to be more dominant. As, as stated by Gómez-Tone et al. (2021), VS plays a crucial role in Computer-Aided Design (CAD) by significantly improving orientation, rotation, and visualization. Because these technical skills are related to CAD, intelligence such as visual spatial (VS) is quite dominant. The same applies to LM intelligence, as it relates to logical, critical, numerical, abstract symbol, and geometric shapes (Korkmaz, 2012). Because CAD is a specific field (interest), this provides a clear indication that intelligence plays a significant role in the vocational field. Another example is the machining field (Computer Aided Manufacturing-Computer Numerical Control (CAM-CNC)), which also requires LM and VS capabilities, because according to Saputra (2024), CAM-CNC requires very tight tolerances in product manufacturing, thus requiring extremely high accuracy. Therefore, supporting capabilities are required, such as VS and LM intelligence, which are some examples of recommended intelligences and this capability can be created (differentiated) into several clusters according to needs.

Non-technical skills, according to the analysis, scored 23%. Skills such as responsibility and professionalism were the dominant aspects of this skill set. Sub-aspects of this skill set focused on several 21st century skills, such as communication, collaboration, creativity, and critical thinking, or the 4Cs (Thornhill-Miller et al., 2023). Thus, it can be interpreted that technical and non-technical skills are interconnected. Furthermore, there is also the term 6C, which includes character and citizenship (Purwanti et al., 2024). This means that these three aspects are interrelated, often referred to as competency. Competency is the knowledge, skills, and attitudes that individuals possess to work appropriately in their respective contexts (Ibrahimova, 2023; Rakasiwi et al., 2023). Therefore, considering the three aspects studied is a relevant urgency in the field of Vocational Education (TVET) and simply needs to be adapted to the field/concentration of interest being pursued. Therefore, to achieve the three aspects studied, or what is referred to as competency, various methods must be used according to the context being pursued. According to Rahdiyanta (2017), there are several learning models suitable for vocational education, including active, contextual, cooperative and collaborative, thematic, discovery learning, problem-based learning, and information technology-based learning models. In addition to learning models, providing facilities and strengthening the bond between educators and students, as well as various relevant aspects, are important for achieving success (Alfiyanto et al., 2023). Furthermore, referring to the opinion of Rojewski (2009) vocational education (TVET) has three philosophies: essentialism, pragmatism, and pragmatic reconstructionism. The goal is to improve job

skills, organizational effectiveness, productivity growth, global competitiveness, and the breadth and depth of competencies learned in a field, both formally and informally, including those with disabilities (Ferrier & Smith, 2010; Sudira, 2017). When discussing vocational education, it cannot be separated from various learning theories, such as: behaviorism theory, cognitivism theory, constructivism theory, humanism theory (Nast & Yarni, 2019). In addition, there are three domains in education that refer to Bloom's Taxonomy, including: the cognitive domain (knowledge), the affective domain (attitudes), and the psychomotor domain (skills) (Nafiati, 2021). With the large amount of interrelated literature, it is hoped that academics and practitioners can innovate (develop) according to the needs of their respective fields so that they can compete globally (not be left behind).

Academics and practitioners have provided similar responses, namely that character is the primary determinant of vocational education graduates' work readiness. Therefore, a positive attitude influences knowledge and skills. Other responses that need to be considered in the 4.0 era for vocational education (TVET) graduates are shown in Figure 1 below, which we refer to as the AYSSE concept. The AYSSE concept is an acronym for several other findings based on the analysis of research informant responses. Furthermore, the concept of the AYSSE aspect is predicted to contribute to and relate to several answers given by research informants.



Source: Author's Analysis Results

Figure 1. AYSSE Concept

CONCLUSION

Research findings reveal that character is a key aspect of vocational graduates' job readiness in the Industrial Revolution 4.0 era, with sub-aspects including honesty, discipline, responsibility, hard work and creativity, and curiosity. Therefore, MBKM best practices in the Industrial Revolution 4.0 era for vocational graduates' job readiness are strongly recommended, emphasizing character while also incorporating technical and non-technical skills, including analytical and evaluation skills, product design skills, ICT skills, communication, responsibility, professionalism, creativity and innovation (innovativeness), work ethic, adaptability, teamwork, politeness, and critical and logical thinking. However, prioritizing all of these aspects is highly beneficial, as these aspects are interconnected. Combining several theories and appropriate learning models will improve vocational students/graduates. Recommended models suitable for vocational education (TVET) include active, contextual, cooperative and collaborative, thematic, discovery learning, problem-based learning, and information technology-based learning models.

This research focuses on important aspects of MBKM in the 4.0 era, especially in the vocational field (TVET); Of course, there are still other possibilities (important aspects in terms of vocational, competency (ability) in Era 4.0 and even 5.0 that can be explored and elaborated in order to strengthen existing concepts. So, we really support other research that is able to answer this with various views that are critically reflective and innovative.

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