Factors Affecting The Readiness of the Dwiwarna High Schools for Industry 4.0

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Abstract

The process of digital transformation at the education level of Senior High School (SMA) or Vocational High School (SMK) poses a very important challenge on how schools can deal with digital transformation effectively. What factors can affect readiness in facing digital transformation. This study was quantitative based with a research focus on Dwiwarna High School, with the number of respondents in this study was 97 (ninety seven) people consisting of students, educators and education staff, where the method of determining respondents was by purposive sample with a questionnaire and distributed via Google Form. Data processing was carried out using multiple linear regression tests and it was found that the factors of educational program, students, training services and organizations simultaneously influenced the readiness of human resources at Dwiwarna High School towards Industry 4.0. With the addition of the HR readiness variable, the results of the study allow researchers to introduce factors that influence HR readiness for digital transformation as a reference for Dwiwarna High School and also for other educational institutions.

Keywords*: Digital Transformation, High School, HR Readiness, Industry 4.0*

INTRODUCTION

Under the influence of the rapid development of the technology industry today, digital transformation occurs in all fields including education, bringing new challenges, and also opportunities for the development of education in Indonesia. By following the current trend, the wave of digitalization is getting stronger and stronger in the world of education, especially at the high school level.

However, digital transformation requires a long-term process, goes through many stages and requires a lot of resources to participate and the need for support from agencies or policymakers, in this case, the Ministry of Education, Culture, Research, and Technology. As a result, there are several questions related to the effectiveness of digital transformation as well as fundamental factors that must be considered when participating in digital transformation. Therefore, an assessment of the readiness for change required to adopt digital transformation

in high school is an important goal. For this purpose, we will assess the readiness of Dwiwarna High School in technical aspects and Personal Factors as a reference in facing digital transformation and also possibly as a reference for other educational institutions.

In the previous study, it was explained in depth regarding the readiness of each of the factors examined, namely education factors, student factors, service factors and training factors at Hanoi University (Giang et al., 2021). However, it has not yet been assessed whether the factors studied are there is an influence on the HR readiness.

Research Objectives

The purpose of this study is to assess the influence of Dwiwarna High School's readiness in facing digital transformation 4.0 in various factors, namely: (1) Is there any influence of the Education Program Factor on the readiness of Dwiwarna High School in facing digital transformation 4.0?; (2) Is there an influence of the Students Factor on the readiness of Dwiwarna High School in facing digital transformation 4.0? (3); Is there any influence on the Training Service Factor on the readiness of Dwiwarna High School in the face of digital transformation 4.0?; (4) Is there an influence of Organizational Factors on the readiness of Dwiwarna High School in the face of digital transformation 4.0?; (5) Is there an influence on the Factors of Education, Students, Training Services, and Organizations simultaneously on the readiness of Dwiwarna High School in the face of digital transformation 4.0?

LITERATURE REVIEW

Digital transformation in the industrial era 4.0 as it is today, is inevitable. Although digital transformation is mostly used in business contexts, it also impacts other areas such as government institutions, public institutions, and organizations. In some fields that have carried out this transformation such as in the world of education with its e-learning, business with e-business, banking with e-banking, government with e-government, and many others, the essence is to increase the efficiency and effectiveness of work and supporting files using big data.

The word digitization or digitize in English means to convert information into a sequence of numbers 0 and 1 so that it can be understood and processed by a computer. The two terms are often used interchangeably but denote the same meaning. But the meaning of the word digitalization has similarities also with the word digitization according to the Oxford and Cambridge English dictionaries. (Gobble, 2018)

Digitalization has a broader meaning, which refers to the use of digital technology or using information that is already in digital form to create and get new value in a new way. (Bican & Brem, 2020). Meaning of digital technology is information that prioritizes activities carried out computer/ digital rather than using human labor. But it is more inclined to an all-automatic and sophisticated operating system with a computer-readable format. (Danuri, 2019).

The statement from Erik Stolterman and Anna Croon Fors's digital transformation is a change related to the application of digital technology in all aspects of people's lives. (Stolterman & Fors, 2004). In the process of digital transformation, we not only utilize technology but also can develop the potential that exists through digital innovation. (Rasid et al., 2021).

The industrial revolution 4.0 was marked by the development of the internet of/Things, its presence was so fast. Many things that were unthinkable before, suddenly appeared and became innovations, as well as opening up huge business land. The presence of the industrial revolution 4.0 can present new businesses, jobs, and professions that have not been thought of before.

The opinion of some experts about the Industrial Revolution 4.0, among others, is that, first, by 2030 as many as 400 million to 800 million people will have to find new jobs because they are replaced by machines. (Manyika, 2017), according to the Minister of National Development Planning, Bambang P.S Brodjonegoro, entering the industrial revolution 4.0 Indonesia will lose 50 million job opportunities while according to the Minister of Industry Airlangga Hartarto, on the contrary. The Industrial Revolution 4.0 provides an opportunity for Indonesia to be able to innovate because a revolution that focuses on developing the digital economy is considered to be profitable for Indonesia. The development of the digital economy is a market and talent, of which Indonesia has both. So disagreeing the Industrial revolution 4.0 will reduce manpower, but instead, it can increase efficiency.

The basic principle of Industry 4.0 is the incorporation of machines, workflows, and systems, by applying intelligent networks along the chain and production processes to control each other independently. (Löffler & Tschiesner, 2013). The digital revolution and the era of technological disruption are other terms of Industry 4.0. It was called the digital revolution because computers are evolving and records are automated everywhere. Industry 4.0 is seen as an era of technological disruption because automation and connectivity in the industry make the movement and competition of jobs in the industrial world non-linear. One of the unique characteristics of industry 4.0 is the application of artificial intelligence (Tjandrawina, 2016). One form of application is the use of robots to replace human labor to make it cheaper, more efficient, and more effective.

In the era of the industrial revolution 4.0, education is needed that can form an innovative, creative, and competitive generation.   One of them can be achieved by optimizing the use of technologies as a teaching tool that is expected to produce results that remain actual or change them for the better. Indonesia must also always improve the quality of graduates in line with the demands of the world of work and digital technology.

Education 4.0 is a response to the needs of the industrial revolution 4.0, where people and technology are aligned to create new possibilities in creative and innovative ways. Fisk explains "that the new vision of learning promotes learners to learn not only skills and knowledge that are needed but also to identify the source to learn these skills and knowledge." (Fisk, 2017)

There are nine trends or trends related to education 4.0 (Anaelka, 2018), which researchers summarize, namely as follows, first learning at different times and places; secondly individual learning, with this the student will learn adaptive with his learning equipment and abilities; all three students have options in determining how they learn, fourth students adapt to project-based learning, fifth field experience because technology allows learning with specific domains, thus impacting gaining skills that involve knowledge and interaction; the sixth is data interplay because technology can take over analysis tasks that are usually done manually; all seven assessments were mixed; The eighth student engagement and the ninth shift in technology 4.0

in education are the responsibility of educators to learners. Educators play an important role in supporting the technology transition and should not be perceived as a threat to conventional teaching.

The era of the Industrial Revolution 4.0 has changed the way we think about education. The changes made concern not only the teaching methods but much more important the change from the point of view of the concept of education itself. Therefore the development of the current and future curricula should pay attention to the pedagogical dimensions, life skills, and abilities. living together (collaboration) and complementing students' critical and creative ways of thinking. Develop soft and transverse competencies, as well as invisible skills unrelated to specific fields of work and academics. However, it is useful in many work situations, such as Interaction skills, living together, the ability to be a globally minded citizen, and media and information literacy.

Curriculum development must be able to guide and shape students who are ready to face the era of the Industrial Revolution, with an emphasis on Science, Technology, Engineering Mathematics (STEM), and character. Reorientation of curricula related to ICT-based learning, the Internet of Things, Big Data, and computerization, as well as entrepreneurship and apprenticeships, should be mandatory curricula to produce graduates who are competent in information literacy, technological literacy, and human literacy. To ensure optimal implementation of the modified curriculum, teachers must have pedagogical competence, technology commercialization competence, globalization competence, future strategy competence, and teacher competence. Teachers must also be technology-friendly, collaborative, creative and take risks, have a sense of humor, and teach holistically (thoroughly).

In the era of Industry 4.0, the goal of the education strategy is to strengthen the development of technology as a solution to information needs and answer rapid changes, as well as improve the future through the integration of Industry 4.0, triggering the birth of various types of learning models, one of which is the distance learning model, this is a learning model that uses a network system on computers that are interconnected via the internet (Sarwa, S.S., 2021). The internet itself is a network connected by various electronic, wireless and optical network technologies (Kriz, 2020). This need is also supported through increasingly sophisticated developments with various applications that make it easier to use for daily activities (Dong et al., 2020).

Educational technology is always open to keep up with the changes and developments of the times. Because educational technology is essentially a discipline that solves learning problems based on several principles and through different learning methods. Learning difficulties can be found anywhere and for anyone. With the Industrial Revolution 4.0, educational technologists should be ready to participate.

The education sector in particular will play an important role, directly or indirectly, in this industrial revolution 4.0. So changes in the education system cannot wait long. One of the changes and preparations in the field of education concerns human resources (HR), namely teachers, and tutors in the field of extracurricular education. This change will not be easy

because it requires serious commitment and full support from the government, academia, and the community.

In several phenomena born from the needs of the Industrial Revolution 4.0, humans and machines are aligned to find solutions, solve various problems that arise, and find various new innovation opportunities that can be used to improve the standard of living of the modern society.

To implement it, teachers as the spearhead of learning must be able to plan and implement quality PBMs. Therefore, it is necessary to have an education that can produce a creative, innovative, and competitive generation. One way is to optimize the use of technology as a teaching tool that is expected to produce outputs that remain actual or change them for the better. Indonesia also needs to improve the quality of graduates in line with the world of work and technology needs.

Research Framework
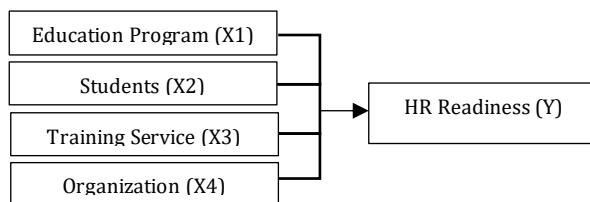
Picture 1. Research Framework

RESEARCH METHODS

To be able to measure readiness in achieving digital transformation, the strategy used is to use a quantitative approach, namely research that can be used to determine the relationship between two or more variables. The method used in the study for data collection is to use of questionnaires, with researchers jumping directly in to take samples from existing populations to speed up the research process. As a differentiator from previous research, researchers added the HR Readiness variable as an independent variable to assess the effect on HR readiness factors in this study. Readiness in achieving digital transformation as can be seen in the table below:

Table 1.
Aspects in Digital Transformation Readiness (Vrchota et al., 2018); (Giang et al., 2021)

Aspects	Criterion
Education Program (X1)	Satisfy social needs Integrate student learning goals (skills, knowledge, and attitudes) Short, flexible, and achievable for all students Designed according to personalized learning
Students (X2)	Be proactive and have an individual mission Have a schedule of learning activities Do scientific research Have social skills
Training Service (X3)	Round-the-clock support Provide a personalized experience Improving lifelong learning Create a stakeholder network Perform an effective counselor system
Organization (X4)	Have an acceptance strategy Attracting company funds for science research Have technologically enhanced public-private partnerships Transform the training model as a business model
HR Readiness (Y)	IT Capabilities

Ability to process and analyze data
Knowledge of statistics
Awareness of the organization and its procedures
Ability to use new technologies
Time management and yourself
Adaptation to change
Work in teams
Social skills
Communication skills

Object of Research

The survey was conducted at Dwiwarna High School located in Parung Bogor in December 2022, the survey was conducted by Students, Educators, and Education Personnel. The total population of respondents at Dwiwarna High School is as follows:

Table 2. Total Population of Dwiwarna High School

No	Description	Population
1	Students	252
2	Educators	53
3	Education Personnel	137

Data Collection

The sampling technique in this study is purposive of samples, this sampling technique by providing its own value to the sample due to consideration of certain characteristics or characteristics. The number of samples in this study is as follows:

Table 3. Total Respondents

No	Description	Respondents
1	Students	39
2	Educators	27
3	Education Personnel	21
Total		97

Research Instruments

Sampling using questionnaires developed from previous studies conducted by (Vrchota et al., 2018); (and Giang et al., 2021). The aspect of respondents' perception of influencing and influencing factors, namely HR readiness consisting of technical and personal, was measured by Likert model questions which included strongly agreeing (5), agreeing (4), undecided (3), disagreeing (2) strongly disagreeing (1), with a total of 27 (twenty-seven) statement items. Questionnaire creation is carried out with the help of current technology, namely Google Form to facilitate the distribution of questionnaires that are distributed to Students, Educators, and Education Personnel in a period of time starting from December 4, 2022, to December 16, 2022. In addition, the questionnaire also recorded respondents' profiles such as gender, age, and work experience for educators and education staff and grade levels in high school for students.

Data Processing Techniques

The collected data will be analyzed using IBM Statistical Package for the Social Sciences (SPSS) Version 25. Previous research data were processed using the Cronbach Alpha Coefficient, whereas in this study, all data obtained were analyzed using Multiple Linear Regression (t-test, F test, and coefficient of determination) by conducting instrument tests (validity test and reliability test) and classical assumption tests (normality test, multicollinearity test, heteroskedasticity test, and autocorrelation test) first (Raharjo, 2019).

RESULTS & DISCUSSION

Research Results

1.   Respondent Profile

A. **Profile of Dwiwarna High School**

Dwiwarna High School (Boarding School) was established in 1998, located in Parung, Bogor, West Java. All activities such as recruiting new students are carried out by distributing brochures, leaflets, and announcements through schools, mass media, and digital media. On July 20, 1998, Dwiwarna High School (Boarding School) accepted 81 students from around 125 students who passed the administrative selection where in the early stages all students received scholarships from the foundation. That was the beginning of the activities of Dwiwarna High School (Boarding School) starting with an integrated education system as planned from the beginning of its establishment.

Dwiwarna High School is a boarding school and public flagship school that has an Islamic spirit and breath, built to advance Islamic youth in Indonesia, to improve the quality of life and also to improve the quality of education, and make a good person, faith, and devotion and knowledge.

B. **Respondent Profile**

To see the readiness of Dwiwarna High School in facing digital transformation 4.0, the profile of respondents in this study consisted of Students, Education Staff, and Educators at Dwiwarna Highschool. The details of the respondents, as listed in the table below:

Table 4. Profile of respondents by gender

No	Respondent	Male	Female	Total
1	Students	17	22	39
2	Educators	19	8	27
3	Education Personnel	15	16	31
TOTAL		**51**	**46**	**97**

Table 5. Profile of respondents by age

No	Age	Total
1	< 20 years	39
2	21 – 30 years	11
3	31 – 40 years	19
4	41 – 50 years	22
5	51 – 60 years	6
6	> 60 years	0
TOTAL		**97**

Table 6. Profile of respondent by work period

| No	Work Period	Total
1	Not Worked (Students)	39
2	< 1 years	3
3	1 – 5 years	13
4	6 – 10 years	10
5	> 10 years	32
TOTAL		**97**

2. INSTRUMENT VALIDITY TEST

The Validity Test is used to measure whether or not a questionnaire is valid or valid. A questionnaire can be declared valid or not if the questions on the questionnaire can reveal something measured by the questionnaire (Sujarweni, 2015).

A. Validity Test

The Pearson correlation significance that the researchers used in this study were 0.05. The basis for making the decision is as follows: If the value of r counts > r table, then the question or statement in the questionnaire is declared valid or If the value of r counts < r table, then the question or statement in the questionnaire is declared invalid
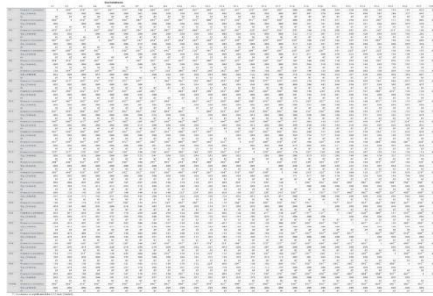
Picture 2. Output SPSS Pearson Correlation

Table 7. Comparison of r-count and r-table

Variable Questions	r-hitung	r-tabel
Education Program (X1)	0.569	0,207
	0.644	0,207
	0.616	0,207
	0.646	0,207
Students (X2)	0.694	0,207
	0.616	0,207
	0.423	0,207
	0.468	0,207
Training Service (X3)	0.652	0,207
	0.696	0,207
	0.700	0,207
	0.576	0,207
	0.620	0,207
Organization (X4)	0.656	0,207
	0.472	0,207
	0.680	0,207
	0.634	0,207
HR Readiness (Y)	0.539	0,207
	0.577	0,207
	0.618	0,207
	0.481	0,207
	0.451	0,207
	0.528	0,207
	0.625	0,207
	0.401	0,207
	0.482	0,207
	0.542	0,207

Based on table 7. Comparing r-count and r-table that obtained r-count values > r-table, then all questions or statements in the questionnaire are declared valid.

B. **Cronbach Alpha Reliability Test**

A reliability Test is a test carried out on question items that are declared valid or valid. This test is carried out to measure questionnaires that are indicators of variables. (Sujarweni, 2015)

Reliability Statistics

| Cronbach's Alpha	N of Items
.921	27

Picture 3. SPSS Reability Statistical Output

A variable is declared reliable if the Alpha value > 0.60, and based on the table above the Alpha value of 0.921, then all variables in this study are declared valid. (Ghozali, 2006)

C. **Test Classical Assumptions**

To determine the accuracy of the model, it is necessary to test several classical assumptions, namely the normality test, the multicollinearity test, the heteroscedasticity test and the autocorrelation test. (Ghozali, 2018)

Normality Test

In the Normality Test Probability Plot, the regression model is said to be normally distributed if the plotting data (dots) that describe the data follow its diagonal line. (Ghozali, 2018)
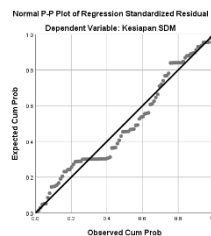
Picture 4. SPSS Output Normality Test Probability Plot

Based on the figure above the data plotting the points following the diagonal line, it can be concluded that the regression model is normally distributed.

Multicholinearity Test

This test is used to assess whether a research model correlates with independent variables. A good model is the non-occurrence of correlations between independent variables and free of symptoms of multicollinearity. To find out the symptoms of multicholineartias, namely by looking at the VIF (Variant Inflation Factor) value and the Tolerance value. The value used to indicate the absence of multicollinearity is a VIF value < 10.00 with a Tolerance value of > 0.10. (Ghozali, 2018)

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	29.677	4.892		6.067	.000		
	Program Pendidikan	.015	.390	.006	.039	.969	.380	2.632
	Peserta Didik	-.022	.396	-.008	-.054	.957	.411	2.433
	Layanan Pelatihan	-.009	.360	-.005	-.024	.981	.279	3.590
	Organisasi	.809	.413	.326	1.957	.053	.351	2.852

a. Dependent Variable: Kesiapan SDM

Picture 5. SPSS Coefficients Colinearity Statistics Output

Based on the picture above, the VIF value in the Education Program (X1) is 2,632 and the Tolerance value is 0.380, the VIF value in Students (X2) is 2.433 and the Tolerance value is 0.411, the VIF value in Training Services (X3) is 3.590 and the Tolerance value is 0.279 and the VIF value in Organizations (X4) is 2.852 and the Tolerance value is 0.351, based on these data it can be concluded that in the Education Program variable (X1), Students (X2), Training Services (X3) and Organizations (X4) have no symptoms of multicollinearity.

Heteroskedasticity Test

The Heterisjedasticity test is used to assess whether regression models occur in variant inequality from one observation to another. (Ghozali, 2018) To detect heteroskedasticity problems can use the graph analysis method, this method is carried out by looking at the plot graph or the predicted value of the dependent variable, namely ZPRED with its residual, namely SRESID.

The basis for making the decision is: (1) If there is a certain pattern, for example, the existing points form a certain regular pilum (wavy, widened, and then narrowed, then heteroskedasticity is indicated and (2) If there is no clear pattern and the dots spread above and below the number 0 on the Y axis, then heteroskedasticity is indicated.
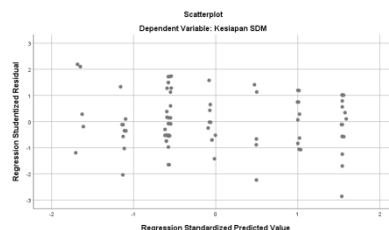
Picture 6. SPSS Output Heteroskedasticity Plot Graph

From the data above, the points do not form a certain pattern and spread below the number 0 on the Y axis, it can be concluded that there are no symptoms of heteroskedasticity.

D. **Multiple Regression Test**

The purpose of multiple linear regression is to test the influence of two or more independent variables on one dependent variable (Ghozali, 2018). Multiple linear regression analysis in this study was used to see the influence of the following hypotheses: (1) Is there any influence of the Education Program Factor on the readiness of Dwiwarna High School in facing digital transformation 4.0?, (2) Is there any influence on the Participant Factor on the readiness of Dwiwarna High School in facing digital transformation 4.0?, (3) Is there any influence on the Training Service Factor on the readiness of Dwiwarna High School in the face of

digital transformation 4.0?, (4) Is there an influence of Organizational Factors on the readiness of Dwiwarna High School in the face of digital transformation 4.0?, and (5) Is there any influence on the Factors of Education Programs, Students, and Training Services and simultaneously on the readiness of Dwiwarna High School in the face of digital transformation 4.0?

T-test

The t-test is an individual partial regression coefficient test used to determine whether an independent variable (X1, X2, X3, X4) individually affects the dependent variable (Y). (Sujarweni, 2015),

The basis for decision making:

1. If the sig value < 0.05 or t calculate > t table then there is an influence of variable X on variable Y
2. If the sig value > 0.05 or t calculate < t table then there is no effect of variable X on variable Y
    The formula t table = $t(\alpha/2 ; n - k - 1)$ = t (0.025 ; 92) = 0.207

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	29.677	4.892		6.067	.000
	Program Pendidikan	.015	.390	.006	.039	.969
	Peserta Didik	-.022	.396	-.008	-.054	.957
	Layanan Pelatihan	-.009	.360	-.005	-.024	.981
	Organisasi	.809	.413	.326	1.957	.053

a. Dependent Variable: Kesiapan SDM

Picture 8. SPSS Table Coefficients Output

From the data above, it can be concluded that in the First Hypothesis Testing (H1) on the Education Program Factor, the sig value is known. for the effect of X1 on Y is 0.969 and the value of t counts 0.369, so it can be concluded that H1 is rejected, which means that there is no influence of X1 on Y, the testing of the Second Hypothesis (H2) on the Learner Factor is known to be a sig value. for the effect of X2 on Y is 0.957 and the value of t counts -0.054, so it can be concluded that H2 is rejected, which means that there is no effect of X2 on Y, the Third Hypothesis (H3) test on the Training Service Factor is known to be a sig value. For the effect of X3 on Y is 0.981 and the value of t counts -0.024, so it can be concluded that H3 is rejected, which means that there is no effect of X3 on Y, the Fourth Hypothesis (H4) test on Organizational Factors is known sig value. for the effect of X4 on Y is 0.053 and the value of t is 1.957, so it can be concluded that H4 is rejected, which means that there is no effect of X4 on Y.

F-test

The F test is an equation significance test used to determine how much influence the free variable (X) has together on the non-free variable (Y). (Sujarweni, 2015) and if the value of sig. <0.05 then it can be interpreted that the independent variable (X) has a simultaneous effect on the dependent variable (Y). (Ghozali, 2011).

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	214.296	4	53.574	2.645	.038[b]
	Residual	1863.580	92	20.256		
	Total	2077.876	96			

a. Dependent Variable: Kesiapan SDM

b. Predictors: (Constant), Organisasi , Program Pendidikan, Peserta Didik, Layanan Pelatihan

Picture 9. Anova SPSS Table Output

Formula F table = F(k;n-k) = F(4;94) = 2.46

In testing the Fifth Hypothesis (H5) it was known that the significance value for the simultaneous influence of X1, X2, X3, and X4 against Y is 0.038 and the F value counts 2.645, so it can be concluded that H5 is accepted which means that there is an influence between X1 (Education Program Factor), X2 (Learner Factor), X3 (Training Service Factor), and X4 (Organizational Factor) simultaneously on Y (HR Readiness in the face of digital transformation 4.0).

Coefficient of Determination

The Coefficient of Determination is used to determine the presence of changes in non-free variables (Y) caused by free variables (X). (Sujarweni, 2015)

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.321[a]	.103	.064	4.501	1.996

a. Predictors: (Constant), Organisasi , Program Pendidikan, Peserta Didik, Layanan Pelatihan

b. Dependent Variable: Kesiapan SDM

Picture 10. Output SPSS Model Summary, R Square

Based on the SPSS output in picture 10 above, it can be concluded that the value of R square is 0.103, this implies the influence of variable X1. X2, X3, and X4 simultaneously against the variable Y are 10.3% (ten point three percent).

DISCUSSION

The Industrial Revolution 4.0 has had an impact on various aspects of life. Inevitably, happy to be unhappy, we must open ourselves to accepting the changes that occur. As the Indonesian nation, we must be optimistic to make changes towards improvement for the welfare of this nation. Dwiwarna High School as one of the education sectors that cannot deny this phenomenon is also preparing to face the industrial revolution 4.0. Various preparations were made by Dwiwarna High School to improve the quality of education so that it could make students become good individuals, who have faith and devotion, and knowledge.

Speaking of the industrial revolution 4.0, which is mostly marked by advances in technology and the internet, there are factors that affect Dwiwarna High School in readiness to face the Industrial Revolution 4.0. However, the results of the partial test show that each of the factors of the education program, students, training services and organization does not significantly influence the readiness of human resources towards the Education Industry 4.0. From these results it can be presumed that nine trends or tendencies related to education 4.0 by Anaelka (2018), have not been realized. For example, for the education program factor (X1) at Dwiwarna High School it has not been fully able to fulfill learn everywhere at anytime, even

though Dwiwarna High School is a school with a boarding school system in meeting the demands of HR readiness towards industry 4.0. In terms of student factors (X2), students are not fully capable of individual learning where students will learn adaptively with their learning equipment and abilities. The training service factor (X3) where the ability to interpret data with the help of technology that can take over analytical tasks that are usually done manually has not fully worked at SMA Dwiwarna. One of the literacy demands in Industry 4.0 is the ability to analyze data with technology. Organizational factors (X4) are thought to have not occurred where the shift in technology 4.0 in the world of education is the responsibility of educators to students. This can be explained by looking at the profiles of respondents where the majority of educators and education staff have more than 5 years of work experience and are over 40 years old, which means that the habit of the old method and culture is firmly attached, so digital shift or transformation has not been effective.

In previous research (Giang et al., 2021), it was stated that in order to increase student satisfaction, improvements were needed in the education program to train competence so that it approached international standards in program structure and content, whereas in this study the education program had no influence on HR readiness at Dwiwarna High School.

The process of digital transformation in education management and teaching organizations has changed learning methods so that resources are needed to organize and create more opportunities for students to participate in various experiences to gain the necessary skills but as a result of this digital transformation students have limited access to many learning opportunities and developing characteristics such as participating in social activities, this is in line with this study, namely the student factor has no influence on HR readiness.

Training services have changed effectively during the process by using digital systems such as using zoom, google meet, etc., this allows students to have an individual learning experience. As in previous research, consulting systems have always been an important part of training, training programs that apply new educational technology to the learning process can help students become more successful in the educational period, even if it is related to the readiness of human resources at SMA Dwiwarna, in this study there was no effect on service training.

In the organizational factors in previous research there were differences of opinion between qualified staff, they differed which showed that the educational process increased awareness of the importance of digital transformation, the higher the qualification, the more people understood the need for digital transformation in the world of education. Highly qualified staff will be a key team to promote and implement digital transformation in schools and they will promote the power of digital technology in providing training, teaching and management services in schools, this is in line with this research, where organizational factors do not affect the readiness of human resources in schools.

The results of the F test show that all factors together influence the readiness of human resources at SMA Dwiwarana towards industry 4.0. The findings of this study show that there has been a readiness of human resources at Dwiwarna High School towards Education 4.0 in the form of a response to the needs of the 4.0 industrial revolution. Educational program factors,

students, training services and organizations where people and technology are aligned to create new possibilities in creative and innovative ways.

DISCUSSION

The Industrial Revolution 4.0 has had an impact on various aspects of life. Inevitably, happy to be unhappy, we must open ourselves to accepting the changes that occur. As the Indonesian nation, we must be optimistic to make changes towards improvement for the welfare of this nation. Dwiwarna High School as one of the education sectors that cannot deny this phenomenon is also preparing to face the industrial revolution 4.0. Various preparations were made by Dwiwarna High School to improve the quality of education so that it could make students become good individuals, who have faith and devotion, and knowledge.

Speaking of the industrial revolution 4.0, which is mostly marked by advances in technology and the internet, there are factors that affect Dwiwarna High School in readiness to face the Industrial Revolution 4.0. However, the results of the partial test show that each of the factors of the education program, students, training services and organization does not significantly influence the readiness of human resources towards the Education Industry 4.0. From these results it can be presumed that nine trends or tendencies related to education 4.0 by Anaelka (2018), have not been realized. For example, for the education program factor (X1) at Dwiwarna High School it has not been fully able to fulfill learn everywhere at anytime, even though Dwiwarna High School is a school with a boarding school system in meeting the demands of HR readiness towards industry 4.0. In terms of student factors (X2), students are not fully capable of individual learning where students will learn adaptively with their learning equipment and abilities. The training service factor (X3) where the ability to interpret data with the help of technology that can take over analytical tasks that are usually done manually has not fully worked at SMA Dwiwarna. One of the literacy demands in Industry 4.0 is the ability to analyze data with technology. Organizational factors (X4) are thought to have not occurred where the shift in technology 4.0 in the world of education is the responsibility of educators to students. This can be explained by looking at the profiles of respondents where the majority of educators and education staff have more than 5 years of work experience and are over 40 years old, which means that the habit of the old method and culture is firmly attached, so digital shift or transformation has not been effective.

In previous research (Giang et al., 2021), it was stated that in order to increase student satisfaction, improvements were needed in the education program to train competence so that it approached international standards in program structure and content, whereas in this study the education program had no influence on HR readiness at Dwiwarna High School.

The process of digital transformation in education management and teaching organizations has changed learning methods so that resources are needed to organize and create more opportunities for students to participate in various experiences to gain the necessary skills but as a result of this digital transformation students have limited access to many learning opportunities and developing characteristics such as participating in social activities, this is in line with this study, namely the student factor has no influence on HR readiness.

Training services have changed effectively during the process by using digital systems such as using zoom, google meet, etc., this allows students to have an individual learning experience. As in previous research, consulting systems have always been an important part of training, training programs that apply new educational technology to the learning process can help students become more successful in the educational period, even if it is related to the readiness of human resources at SMA Dwiwarna, in this study there was no effect on service training.

In the organizational factors in previous research there were differences of opinion between qualified staff, they differed which showed that the educational process increased awareness of the importance of digital transformation, the higher the qualification, the more people understood the need for digital transformation in the world of education. Highly qualified staff will be a key team to promote and implement digital transformation in schools and they will promote the power of digital technology in providing training, teaching and management services in schools, this is in line with this research, where organizational factors do not affect the readiness of human resources in schools.

The results of the F test show that all factors together influence the readiness of human resources at SMA Dwiwarana towards industry 4.0. The findings of this study show that there has been a readiness of human resources at Dwiwarna High School towards Education 4.0 in the form of a response to the needs of the 4.0 industrial revolution. Educational program factors, students, training services and organizations where people and technology are aligned to create new possibilities in creative and innovative ways.

CONCLUSION & SUGGESTION

The Industrial Revolution 4.0 has had an impact on various aspects of life. Inevitably, happy to be unhappy, we must open ourselves to accepting the changes that occur. The development of technology is the right tool for learning. Dwiwarna High School as one of the education sectors that cannot deny this phenomenon is also preparing to face the industrial revolution 4.0. Various preparations were made by Dwiwarna High School to improve the quality of education so that it could make students become good individuals, who have faith and devotion, and knowledge.

In the research that has been done, four factors were studied, namely educational program factors, student factors, training service factors and organizational factors which were analyzed using multiple linear regression analysis and with the additional independent variable, namely HR readiness, obtained different results from previous research, so it can be seen that these four factors have no influence on HR readiness, this is possible because HR at SMA Dwiwarna is an important key towards digital transformation. The four factors simultaneously affect HR readiness towards industry 4.0.

For actors in the world of education advances in communication and information technology can be new challenges and opportunities in their utilization. Opportunities such as wider access to information or creative content and the development of learning methods which are no longer limited by space and time as before. Therefore, special techniques or methods are needed for organizational and administrative arrangements as well as communication through various media.

This research still has many limitations. It is recommended for future researchers to conduct research at other high schools or other levels of education such as junior high schools or even tertiary institutions and assess the extent of the readiness of human resources in these educational institutions in facing digital transformation.

REFERENCES

Anaelka, A. H. (2018). Education 4.0 Made Simple: Ideas For Teaching. International Journal of Education and Literacy Studies, 6(3), 92. https://journals.aiac.org.au/index.php/IJELS/article/view/4616

Bican, P. M., & Brem, A. (2020). Digital Business Model, Digital Transformation, Digital Entrepreneurship: Is there a sustainable "digital"? Sustainability (Switzerland), 12(13), 1–15. https://doi.org/10.3390/su12135239

Danuri, M. (2019). Development and transformation of digital technology. Infokam, XV(II), 116–123.

Dong, H., Yang, F., Lu, X., & Hao, W. (2020). Internet Addiction and Related Psychological Factors Among Children and Adolescents in China During the Coronavirus Disease 2019 (COVID-19) Epidemic. Frontiers in Psychiatry, 11(September), 1–9. https://doi.org/10.3389/fpsyt.2020.00751

Fisk, P. (2017). Education 4.0 … the future of learning will be dramatically different, in school and throughout life. Https://Www.Peterfisk.Com/2017/01/Future-Education-Young-Everyone-Taught-Together/.

Ghozali, I. (2006). Aplikasi Analisis Multivariate dengan Program SPSS (Edisi Ke 4). Universitas Diponegoro.

Ghozali, I. (2011). Aplikasi Analisis Multivariate Dengan Program IBM SPSS 19. Universitas Diponegoro.

Ghozali, I. (2018). Aplikasi Analisis Multivariate dengan Program IBM SPSS 25. Universitas Diponegoro.

Giang, N. T. H., Hai, P. T. T., Tu, N. T. T., & Tan, P. X. (2021). Exploring the readiness for digital transformation in a higher education institution towards industrial revolution 4.0. International Journal of Engineering Pedagogy, 11(2), 4–24. https://doi.org/10.3991/IJEP.V11I2.17515

Gobble, M. A. M. (2018). Digital Strategy and Digital Transformation. Research Technology Management, 61(5), 66–71. https://doi.org/10.1080/08956308.2018.1495969

Kriz, W. C. (2020). Gaming in the Time of COVID-19. Simulation and Gaming, 51(4), 403–410. https://doi.org/10.1177/1046878120931602

Löffler, M., & Tschiesner, A. (2013). The Internet of Things and the future of manufacturing. McKinsey on Business Technology, 30(2), 8–13. http://www.mckinsey.com/insights/business_technology/the_internet_of_things_and_the_future_of_manufacturing

Manyika, J. et al. (2017). Jobs lost, jobs gained: What the future of work will mean for jobs, skills, and wages. McKinsey & Company. https://www.mckinsey.com/featured-insights/future-of-work/jobs-lost-jobs-gained-what-the-future-of-work-will-mean-for-jobs-skills-and-wages

Raharjo, S. (2019). Trik Analisis Regresi Linear Berganda Sekaligus Uji Asumsi Klasik dengan SPSS. https://www.youtube.com/watch?v=CUDi5BFQOI0

Rasid, F. E. T., H, S. P., & Rizal, M. N. (2021). Faktor Pendorong, Proses Dan Tantangan Transformasi Digital Pada Usaha Mikro, Kecil Dan Menengah: Tinjauan Pustaka Sistematis. Pemodelan Arsitektur Sistem Informasi Perizinan Menggunakan Kerangka Kerja Togaf Adm, 6(2), 62.

Sarwa, S.S., M. M. (2021). Pembelajaran Jarak Jauh : Konsep, Masalah dan Solusi. Adab.

Stolterman, E., & Fors, A. C. (2004). Information technology and the good life. IFIP Advances in Information and Communication Technology, 143(January 2004), 687–692. https://doi.org/10.1007/1-4020-8095-6_45

Sujarweni, V. W. (2015). Metodologi Penelitian Bisnis dan Ekonomi V. Wiratna Sujarweni. PUSTAKABARUPRESS.
http://repo.unikadelasalle.ac.id/index.php?p=show_detail&id=11667&keywords=

Tjandrawina. (2016). Industri 4.0: Revolusi industry abad ini dan pengaruhnya pada bidang kesehatan dan bioteknologi. Jurnal Medicinus, Vol 29, Nomor 1, Edisi April. Jurnal Medicinus, Vol 29, No(1), 31–39.

Vrchota, J., Monika Maˇriková, Petr ˇRehoˇr, L. R., & Toušek, R. (2018). Human Resources Requirements for Industry 4 . 0. Journal of Open Innovation: Technology, Market, and Complexity, 1–20.