IMPORTANCE-PERFORMANCE ANALYSIS ON WORK BASED LEARNING AND DIGITAL LITERACY OF TOURISM STUDENTS IN COPING WITH THE ERA OF INDUSTRY 4.0

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Abstract

Industrial Revolution 4.0 brings a lot of changes of the working environment and we tend to be dependent of the technological and digital advancement. Employees should also master digital literacy and thus vocational institutions that create quality of employment should also prepare their students to become professionals through work based learning. This study investigated the level of work based learning and digital literacy of tourism students in an Indonesian tourism vocational institution. The study utilizes the quantitative approach using importance-performance analysis where there are 4 quadrants which should be looked at. Items of the questionnaire were developed using theory of life skills 4Hs and digital literacy. The data was collected from 260 students who have conducted internship program and they were selected purposely. The results show that there is high priority to develop skills of students in making structured plan, applying healthy life and control physical or mental strain and pressure (Quadrant A/high priority). There is also a need to increase the capability of students in mastering digital literacy as all items of digital literacy are counted in quadrant C (low priority).

Keywords: Industrial Revolution 4.0, Digital Literacy, Life Skills 4Hs, Work Based Learning & Internship.

1. Introduction

Nowadays, Industrial Revolution 4.0 or digital revolution has changed every aspects of employment and can impact the creation of new problems (new waves of disruption) that are currently challenging every industry in the world. The impact of industrial relocation is an intensive and massive automation application that changes digital job requirements.One effect of the industrial revolution 4.0 has influenced the aspects of human resources where those who do not master digital literacy sooner or later could be eliminated if they did not adapt to the current situation. This certainly becomes a threat as well as a challenge for educational institutions in Indonesia. Thus, the role of educational institutions increasingly faces the demands of extraordinary adjustments in balancing the needs of students and the needs of the workforce.

The strategy of the Ministry of Tourism of the Republic of Indonesia for sixstate tourism institutions managed by the ministry is to deal with curriculum, certification and center of excellence for each institution. However, the classical problem which always becomes the biggest challenge in education is to overcome gap between educational institutions and industry. Several studies have been conducted to deal with the gap between the quality of graduates and the competencies needed by the industry. One of them is related to learning policy namely the work based learning (WBL) or in Indonesia it is known as workplace-based learning approach.

Some studies summed up that the implementation of WBL in educational institution has provided positive influence in terms of achievement, motivation, continuing education (Bailey and Merritt, 1977). WBL is a contextual approach where the workplace provides a set of workplace based learning experience structured accordingly. Therefore, a set of workplace training programs is utilized and provided for students as trainees to prepare them for their sustainable working experience in the workplace environment.

The implementation of WBL approach in tourism institutions supervised by the Ministry of Tourism is conducted in the form of internship program. This program is implemented in one semester (around six month). All students are placed in hospitality enterprises, travel operators, travel agencies, airlines and other tourism organizations related to the courses taken by the students. Students are expected to experience industrial activities with various problems which need to be coped with. However, there is a tendency that there is a lack of supervision in controlling the achievement of learning experience of students in the workplace. Thus, many students may not possess expected experience when they return from the industry after their internship program. This condition is certainly contrary to the actual concept of WBL implementation where experiential learning is the main basis. Work experience complemented by instructions and activities can apply, strengthen, improve or expand learning that occurs in the workplace, so students develop attitudes, knowledge, skills, and habits that may not develop from their own work experience (Vermont Agency of Education, 2014).Good and right work experience will shape students' life skills in facing future life challenges.

This study aims to identify the level of WBL in tourism vocational education institutions using the WBL instrument which was adopted by several researchers. Specifically, this research can be used for the government to determine the direction of tourism vocational policies in dealing with industry 4.0. In general, this study aims to provide an overview of the existence of students in adapting to industry 4.0. This research is also useful to see the extent of the use of instruments in measuring WBL in the context of tourism vocational education.

2. Literature Review

Globalization has entered a new era called the Industrial Revolution 4.0 Schwab, (2016) claimed that through the Fourth Industrial Revolution, the world has experienced four stages of revolution, namely: 1) Industrial Revolution 1.0 occurred in the 18th century through the invention of steam engines where goods could be massively produced, 2) Industrial Revolution 2.0 occurred in the 19-20th century through the use of electricity which lowers the production costs 3) the Industrial Revolution 3.0 occurred around the 1970s through the use of computerization, and 4) the Industrial Revolution 4.0 itself occurred around 2010s through intelligence engineering and the internet as the backbone of the movement and connectivity of humans and machines.

HR Reorientation of the Industrial Revolution 4.0 Era

Digitally connected manufacturing called industry 4.0 is a term that was first coined in Germany covering various types of technology, from 3D printing to robotic, new types of materials and production systems. For developed countries, industry 4.0 can be a way to regain infrastructure competitiveness, especially for Western European countries. For developing countries like Indonesia, industry 4.0 can help to simplify the supply chain of production, which is urgently needed to anticipate rising labor costs.In facing the 4.0 industrial revolution, there are at least three things that need to be considered by all parties. First, is quality, which is an effort to produce quality human resources to fit the need of the job market based on digital technology. Secondly, it is a matter of quantity, which is to produce a number of qualified, competent human resources according to industrial needs. Third, there is a problem of distribution of quality human resources which is still uneven. Therefore, regarding efforts to increase competency and

productivity of human resources, massive efforts need to be made through job training institutions, professional certification bodies that are being carried out by the government through training in vocational training centers and apprenticeship programs.

In order to cope with the challenges of the industrial revolution 4.0era, it is not enough just to utilize old human literacy which is only based on the ability to read, write and count Aoun, (2017) argues that in creating competitive human resources in industry 4.0, the education curriculum must be designed to produce output which can be able learners to master new literacy, namely: (1) data literacy, namely the ability to read, analyze and utilize big data information in the digital era, (2) technological literacy, which is understanding the work of machines, application of technology (coding, artificial intelligence and engineering principles) and (3) human literacy, humanities, communication and design. In this regard, the tourism institutions should also be aware of the new literacy in designing curriculum, conducting learning program and developing competency.

Work Based Learning Approach

Work-based Learning (WBL) as an approach to learning that results from the involvement of students in activities in the workplace with employers and is designed to improve students' knowledge and skills. Work experience is complemented by instructions and activities that apply, strengthen, improve or expand learning that occurs during work, so students develop attitudes, knowledge, skills, and habits that may not develop from their own work experience (Vermont Agency of Education, 2014). Furthermore, Vermont Agency of Education, (2014) also explained that the WBL helps create opportunities for employers and educational institutions to provide structured experience-based learning to develop work readiness, technical skills and 21st century skills. This is a process that allows students to explore careers related to business, learn about organizational functions, and understand the relevance of the education. Learning experiences with WBL are activities that involve actual work experience connecting learning, work and career. Through WBL, education programs are becoming more relevant, rigorous, challenging, and beneficial for students, parents, educators and business. This opportunity is very helpful for students to make connections between academic principles and real world applications. This can answer people's curiosity related to a question 'Why do I need to know this?' and it can provide motivation to learn more.Through further research, Vermont Agency of Education, (2014) summed up that both WBL and 21st Century Skill can lead employees to success at work. This notion implies that the use of WBL as an approach of learning in order to master the 21st Century skills, WBL can help individuals succeed in the working envoironment. However, we need to identify the ways of WBL implementation that strengthen the outcomesof individuals who are able to master skills related to the 21st century skills (industrial revolution 4.0).

New Life Skills and Literacy in Industry 4.0

The demand of 21st century expertise (industrial revolution 4.0) has common similarities and even the same concept as life skills. (Jones and Lavallee, (2009) argued that conceptually life skills apply as a sequence of choices that strengthen the psychological life a person makes in a specific field of skill. (Davis, (2000) defines that life skills are personal guidelines for the human body that helps students learn how to maintain a healthy body, grow as individuals, work well, make logical decisions, look after themselves when needed and reach life goals. Brolin, (1989) defines life skills as the skills that a person has to dare to face life's problems and natural life without any pressures, then the person proactively and creatively seeks and find solutions in order to be finally able to overcome the problems. World Health Organization, (1999) defines life skills as skills or abilities to be able to adapt and behave positively and in turn the skills can enable a person to be able to face various demands and challenges in this life more effectively. Hospson and Scally, (1997) suggested that life skills are self-development to survive, grow, and

develop as well as to have ability to communicate and relate individually, in groups and through systems in dealing with certain situations.

Regarding the taxonomy of the category of life skills, it can be seen that there are many similarities from one expert to another. This study adopts a model developed by Hendricks, (1998) and states that Life skills are divided into four categories, namely: 1) head, namely life skills related to something that a person has in the form of knowledge, reasoning, and creativity; 2) heart covering all abilities related to self-understanding and the ability to interact with the (social) environment; 3) hand indicates that a person needs to have technical skills such as vocational skills; 4) health includes abilities associated with improving self-quality or self-actualization, and the ability to maintain and develop a healthy life attitudes such as paying attention to appearance, maintaining hygiene, and behaving healthy. Furthermore, Hendricks' life skills model is called 4-H life skills. The application of the 4-H life skills model has been successfully implemented in the United States. This 4-H life skills model will be integrated in the WBL learning process in the tourism industry in an effort to produce resilient students facing the challenges of the industrial revolution 4.0.

A better implementation of life skills in Industry 4.0 should go together with new literacy skills because according to Brolin, (1989), learners must master new literacy. The new literacy includes data literacy, technology literacy, and human literacy. Data literacy is the ability to read, analyze and utilize big data information in the digital era. Furthermore, technological literacy is an understanding of how the machine works and the application of technology. Human literacy includes communication and design so that human beings can function properly in an increasingly dynamic human environment. For this reason Haryono, (2018) believes that the aspect of human literacy is very important in the era of Industry 4.0 as the basic capital of human resources.

Constructs of 4H Life Skills and New Literacy

The constructs of 4-H life skill developed by [10]in detail can be broken down into dimensions and indicators which will be used in this study as follows:

Head

Based on the model proposed by Hendricks, (1998), the sub variable head consists of managing and thinking dimensions. The managing dimension includes 4 (four) indicators, namely resilience (adaptability: the ability to recover after experiencing misfortune or disease; coping with change; and overcoming problems and difficulties); keeping records (recording selected useful information, usually focused on a specific purpose); wise use of resources (using sound judgment; not wasteful; being responsible; setting priorities); planning/organizing (a method for doing something that has been thought out ahead of time; how the parts can be put together; and goal setting (deciding on the purpose or desired result; something to work toward). On the other hand the thinking dimension consists of 5 (five) indicators, namely service learning (gaining skills and experience through active participation in organized service experiences, that meet actual community needs and that are coordinated with the school and community; learning linked with real life); critical thinking (strategies for analyzing, comparing, reasoning, and reflecting focused on deciding what to believe or do; discovering meaning; building connections with past learning); problem solving (clearly identifying a problem and a plan of action for resolution of the problem); decision making (choosing among several alternatives), and learning to learn (acquiring, evaluating and using information; understanding the methods and skills for learning).The adaptation of the two dimensions of head sub variable in the question items used for this study can be seen as follows:

Table 1: Construct Adaptation for Head

Dimension	Indicator	Items	Item
Managing	Resiliency	Fix task error	1
		Cope with change	2
	Keeping records	Record selected information	3
	Wise use of resources	Use resources wisely in the workplace	4
	Planning/organizing.	Make structured plan	5
		Organize tasks	6
Thinking	Goal Setting	Set learning goal	7
	Service Learning	Actively learn new competency	8
	Critical thinking	Analyze and develop ideas	9
	Problem solving	Identify problem and solve the problem	10
	Decision Making	Come with alternatives of actions	11
	Learning to learn	Gain and evaluate information	12

Heart

Furthermore, the sub variable of heart consists of relating and caring dimensions. On the dimensions of relating, there are 5 (five) indicators, namely accepting difference (to recognize and welcome factors that separate or distinguish one person from another); conflict resolution (finding and applying creative and non-destructive ways to resolve differences between two or more persons; getting along with others); social skills (skills people use when interacting with others and to behave in the accepted manner or customs of the society in which they live; adapting well to one's social environment); cooperation (to work or act together for a common purpose or mutual benefit); and communication (exchange of thoughts, information or messages between individuals; sending and receiving information using speech, writing, gestures and artistic expressions). The adaptation of heart in the question items of this study can be seen as follows:

Table 2: Construct Adaptation for Heart

Dimension	Indicators	Items	Item No
Relating	Accepting differences	Understand differences in the workplace.	13
	Conflict resolution	Help others in solving problem creatively	14
	Social Skills	Interact and adapt in a good manner with others	15
	Cooperation	Work with others	16
	Communication	Exchange and receive idea or information effectively	17
Caring	Nurturing relationship	Nurture relationship with others for mutual benefit	18
	Sharing	Share with others	19
	Empathy	Identify person's situation or feeling with others	20
	Concern for others	Pay special attention to others	21

Hand

Sub variable of hand consists of giving and working. The dimension of giving includes community service volunteering (to donate one's time and/or effort of one's own free will for the benefits of the group without guarantee); leadership (to assist the group in meeting its goals by showing or directing along the way; using personal influence to guide the group in reaching its goals); responsible citizenship (an individually demonstrating love and devotion in response to duties, rights and privileges as a member of a community or country); and contribution to group efforts (to give or supply along with others for a common purpose). While the working dimension includes marketable skills (to have the abilities wanted by employers and needed to hold a job); teamwork (work done by two or more people, each doing parts of the whole task); and self motivation (able to make the needed effort to carry out a task or a plan; personal will to take action). The adaptation of hand attributes in this study based on dimensions can be seen as follows:

Table 3: Construct Adaptation of Hand

Dimension	Indicators	Items	Item No
Giving	Community service volunteering	Provide excellent service	22
	Leadership	Direct and influence others	23
	Responsible citizenship	Be loyal in the workplace	24
	Contribution to group efforts	Give efforts when work with others	25
Working	Marketable skills	Apply marketable skills	26
	Teamwork	Work in a team.	27
	Self-motivation	Motivate oneself	28

Health

The health sub variable consists of living and being. The living dimension consists of 4 (four) indicators namely healthy lifestyle choices (increased knowledge, attitude and behavior that insure current good health, as well as those that assure future well-being such as exercise, nutrition, disease prevention, personal safety and stress management); stress management (to direct or have control over physical or mental strain and pressure, or one's reaction to it; coping with change); disease prevention (to anticipate and ward off conditions that keep the body from functioning normally, such as infection or stress that impairs normal physiological functioning); and personal safety (taking care to avoid danger, risk, or harm; self-protection; being cautious, careful; physically and emotionally safe). Furthermore, being consists of 4 (four) attributes, namely self-esteem (pride in oneself; proper regard for oneself as a human being; valuing oneself; a feeling of ability to cope; learning to accept and like oneself); self-responsibility (taking care of oneself; being accountable for one's behavior and obligations; choosing for oneself between right and wrong); character (a person's moral strength; integrity, fortitude, reputation; a person's usual qualities or traits; adherence to a code of values or ethical principles); and managing feelings (expressing one's feelings appropriately and in proportion to circumstance); and self-discipline (control of self and one's conduct in line with moral character (what is right and wrong), personal values (what one considers important), and natural expectations; control before acting in a hurtful or harmful way).

Table 4: Construct Adaptation of Health

Dimension	Indicators	Items	Item No
Living	Healthy lifestyle choices	Apply healthy life style	29
	Stress management	Control physical or mental strain and pressure	30
	Disease prevention	Prevent disease	31
	Personal safety	Avoid danger, risk or harm.	32
	Self esteem	Value oneself	33
	Self-responsibility	Be accountable	34
Being	Character	possess strong character based on code of values/ethical principles	35
	Managing feelings	Express felling in an appropriate manner	36
	Self-discipline	Have self-discipline	37

New Literacy 4.0

New literacy 4.0 sub-variable consists of 3 (three) dimensions, namely big data, technology and people Brolin, (1989). Dimension of big data includes reading, analyzing and utilizing data. The technological dimension includes indicators of understanding how the machine works and technology applications. Furthermore, the human dimension includes humanity, communication and design. In this research, the human dimension was not developed in the research instrument because the researcher assumed that the human dimension has been specifically integrated in the 4-H life skills concept. Therefore, the question items in the research instrument only include the dimensions of big data and technology as follows:

Table 5: Construct of New Literacy 4.0

Sub Variable	Indicators	Attributes	Item No.
Big Data	Reading	Read digital data properly	38
	Analyzing	Analyze digital data	39
	Making use of data	Make use of digital data related the job	40
		Store digital data properly	41
Technology	Understanding the work of machine	Understand the operation of equipment	42
	Technological Application	Understand data coding in a computer based on the needs	43
		Understand hardware and software to use in the job	44
		Understand engineering principle that supports the job.	45

3. Method

This research is a quantitative study using a survey approach. In this study, a survey was conducted on 260 students of, the Makassar Tourism Polytechnic (a tourism vocational education institutionunder supervision of the Ministry of Tourism of the Republic of Indonesia)who had conducted internship in tourism and hospitality industry. Questionnaires were distributed to each study program accidentally. The items in the questionnaire were built based on the model from Hendricks, (1998) for 4-H life skills and Brolin, (1989) for new literacy 4.0. The statements were made into 2 parts, namely before conducting internship to measure importance and after students doing internship to measure performance. Statements of

attributes were formulated in the context of the tourism and hospitality industry. Content and face validation were carried out to ensure the quality of the questionnaire. Then, the instrument test was conducted on 30 students to see the validity and reliability of the instrument and the results show that all items met the requirements.The collected data was analyzed using Cartesian quadrant analysis in order to explain students' performance in relation to 4-H life skills and new literacy in dealing with industry 4.0 while they were carrying out internship. The Cartesian Quadrant analysis aims to look at 4 aspects namely Quadrant A (Top Priority), Quadrant B (Maintaining Performance), Quadrant C (Low Priority) and D Consciousness (Overuse) as shown in Figure 1 below. Based on 45 attributes established for the questionnaire, the attributes for expectations were formulated as students 'abilities before conducting internship while the attributes for reality were formulated as students' experiences after conducting intership. In order to map items that were included in a particular quadrant, this study uses SPSS software to process the data.

4. Results and Discussion

Data from the questionnaire was analysed using the SPSS program in order to map the expectations and the reality in the Cartesian quadrant based on the results of respondents' answers on the distributed questionnaire. The Cartesian quadrant can show the importance vs. performance criteria as follows:
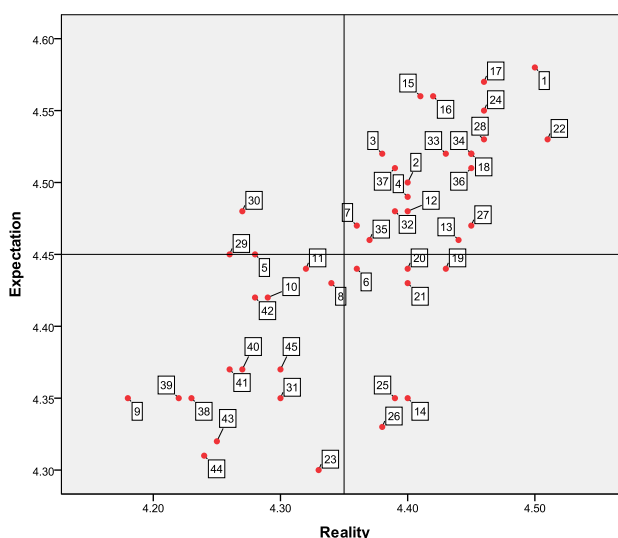

Figure 1: Results of Quadrant Analysis

Based on the analysis of Cartesian system, all items of expectation and reality have been mapped into four quadrants. The mapping results for each quadrant can be discussed as follows:

Quadrant A

In Quadrant A, there are 3 (three) attributes which should be the main focus for development and need to be prioritized as can be seen the following table:

Table 6: Results of Quadrant A

Item No.	Attributes
5	Make structured plan
29	Apply healthy life style
30	Control physical or mental strain and pressure

The three items that become the priority in conducting of internship program in order to develop skills in the workplace include making structured plans, applying physical life and controlling physical or mental strain and pressure so that it is necessary to focus on these three aspects. This result shows that 2 attributes are included in the health sub variable and 1 attribute is included in the head sub variable.

Quadrant B

Quadrant B includes components that must be maintained because all attributes in this quadrant are considered good. Nevertheless, all attributesin this quadrant should be maintained and continually improved so that the performance is equal or higher than the importance evaluation. The attributes included in this quadrant can be seen in the following table:

Table 7: Results of Quadrant B

Item No	Attributes
1	Fix task error
2	Cope with change
3	Record selected information
4	Use resources wisely in the workplace
7	Set learning goal
12	Gain and evaluate information
13	Understand differences in the workplace.
15	Interact and adapt in a good manner with others
16	Work with others
17	Exchange and receive idea or information effectively
18	Nurture relationship with others for mutual benefit
22	Provide excellent service
24	Be loyal in the workplace
27	Work in a team.
28	Motivate oneself
32	Avoid danger, risk or harm.
33	Value oneself
34	Be accountable
35	Possess strong character based on code of values/ethical principles
36	Express felling in an appropriate manner
37	Have self-discipline

Aspects that need to be maintained consist of 6 items of head, 5 items of heart, 4 items of hand and 6 items of health. Attributes of head include fixing task error, coping with change, recording selected information, using resources wisely in the workplace, setting learning goals and gaining and evaluating information. Attributes of heart are understanding differences in the workplace, interacting and adapting in a good manner with others, working with others, exchanging and receiving ideas or information effectively and nurturing relationships with others for mutual benefit.Attributes of hand consist of providing excellent service, being loyal in the workplace, working in a team and motivating oneself. Attributes of health consist of avoiding danger, risk or

harm; valuing oneself; being accountable; possessing strong character based on code of values/ethical principles; expressing felling in an appripriate manner and havingself discipline.

Quadrant C

Quadrant C includes things that need attention, but still in the category of low priority. Attributes in this quadrant have a low level of importance according to respondents but the performance is considered good. The items in this quadrant also need to be considered in developing the internship program as can be seen in the following table:

Table 8: Results of Quadrant C

Item No	Attributes
8	Actively learn new competency
9	Analyze and develop ideas
10	Identify problem and solve the problem
11	Come with alternatives of actions
23	Direct and influence others
31	Prevent disease
38	Read digital data properly
39	Analyze digital data
40	Make use of digital data related the job
41	Store digital data properly
42	Understand the operation of equipment
43	Understand data coding in a computer based on the needs
44	Understand hardware and software to use in the job
45	Understand engineering principle that supports the job.

Aspects that need to be improved in the implementation of internship but they are low priority consist of 4 items of head, 1 item of hand, 1 item of health and all items (8 items) of new literacy. Attributes of head consists of actively learning new competencies, analyzing and developing ideas, identifying problems and solving the problems and coming with alternatives of actions. Items of hand include directing and influencing others. Item of health is prevention of disease. Attributes of new literacy include reading digital data properly, analyzing digital data, making use of digital data related to the job, storing digital data properly, understanding the operation of equipment, understanding data coding in a computer based on the needs, understanding hardware and software to use in the job and understanding engineering principles that support the job.

Quadrant D

Existing attributes in this quadrant do not need a strategy to improve quality because quadrant D is a position where attributes have low importance, but high performance. Attributes of this quadrant have low level of importance so it is considered excessive.

Table 9: Results of Quadrant D

Item No	Attributes
6	Organize tasks
14	Help others in solving problem creatively
19	Share with others
20	Identify person's situation or feeling with others
21	Pay special attention to others
25	Give efforts when work with others
26	Apply marketable skills

In this quadrant, there are 1 attributes of the head sub variable, 4 attributes of the heart sub variable and 2 attributes of the hand sub variable. The Attribute of head is organizing tasks. Attributes of heart include helping others in creatively solving problems, sharing with others, identifying someone's situation or feeling with others and paying special attention to others. Furthermore, attributes of hand consist of giving efforts when working with others and applying martketable skills.

Conclusion

Based on the Cartesian Quadrant Analysis, attributes that exist in Quadrant A and Quadrant C are important priorities for improvement where attributes which are included in Quadrant A are top priority and attributes included in Quadrant C are less priority. The findings of this study show that there is high priority to develop skills of students in making structured plan, applying healthy life and control physical or mental strain and pressure. In this regard, educational institutions should be aware of students' skills in these three areas before students are placed in the industry for internship program.The findings of this study also show that there is a need to pay attention on the new literary in era of digitalization as students performance are still considered low. All in all, WBL and new literary should be taken into account by vocational education institutions in order to prepare students for a better performance of their intership program and future career in the workplace.

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