A STUDY ON GUIDELINES FOR DEVELOPING THE POTENTIAL OF EDUCATIONAL PERSONNEL IN VIRTUAL REALITY (VR) TECHNOLOGY

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ABSTRACT

This research aims to study and analyze confirmatory factors and guidelines for developing educational personnel on Virtual Reality (VR) technology.

***Methodology**: The sample group consisted of 210 participants of the Pioneer Project for "Developing Learning Center and Virtual Reality (VR) Curriculum for Students" of the Broadcasting and Telecommunications Research and Development Fund for the Public Interest (BTFP) obtained by using purposive sampling. The research tool was a 5-rating scale questionnaire, i.e., highest level, high level, moderate level, low level, and lowest level, divided into 3 dimensions including knowledge, skills, and attributes. The statistics used for analyzing the data were frequency, percentage, mean, standard deviation, and index of item objective congruence (IOC) of model and empirical data through confirmatory factor analysis.*

***Findings**: (1)Participants had opinions towards the guidelines for developing potential of educational personnel on Virtual Reality (VR) technology in overview and in all dimensions (including knowledge, skills, and attributes) in high level. (2). Structural Equation Modeling (SEM) of second-order confirmatory factor analysis of potential development of educational personnel on Virtual Reality (VR) technology consisted of 20 indicators covering 3 factors including 6 indicators on knowledge, 7 indicators on skills, and 7 indicators on attributes. The model was consistent with empirical data with priority of factors ordered in descending order, i.e., skills, attributes, and knowledge (χ^2=194.687, df=167, p=0.070, χ^2/df =1.166, GFI=0.963, AGFI=0.953, RMSEA=0.018).*

Keywords: Potential Development, Knowledge, Skills, Attributes, Virtual Reality (VR) Technology.

INTRODUCTION

The 20-Year National Strategy sets the goal of enabling Thailand to improve its development level to achieve the vision stated that *"Thailand must be stable, wealthy, and sustainable as a developed country through development under the Sufficiency Economy Philosophy,"* whereas the Thai government has realized the necessity of implementing digital technology as an important element to drive national reform in order to make Thailand 4.0 for building an economic and social system that is driven by innovations to free Thailand from the middle-income trap, inequality trap, and imbalance trap. The Thai people will gain educational opportunities of good quality and modernity, enabling them to stand on the world stage proudly (Office of the National Economics and Social Development Council, 2017). In addition, the National Digital Economy and Society Development Plan and Policy (B.E. 2561-2580) also

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directs the direction to drive the sustainable development of Thailand by using digital technology that is consistent with national strategies. The National Economic and Social Development Plan also establishes a National Digital Economy and Society Development Strategy in the 5th strategy to develop a workforce to be ready for the digital economy and society by emphasizing digital workforce development to support operations in the digital economy system with a focus on both the working groups that will be the important workforce for productivity in the economic system and digital specialist groups. Moreover, the Master Plan for Digital Economy (B.E. 2561 -2565) also establishes the vision to drive Thailand *"to a digital economy with dynamics based on society with metacognition, literacy, and a workforce that can adjust themselves and gain opportunities from digital technology and innovations".* The 1st strategy to develop a workforce for the digital era is to develop a workforce by emphasizing on developing digital skills that are necessary for occupations and living as well as to learn, adjust, and apply technology and innovations of the digital world that are considered specific digital skills, skills for applying digital technology and innovations for work processes on digital platforms or changed by digital technology, and other skills that are necessary in the digital era. The goal is to improve the potential of the 500,000 digital workforces according to the Master Plan for the Digital Economy (B.E. 2561 - 2565) (Office of the National Economics and Social Development Council, 2017).

The Office of Technology Development for Industry is a section of King Mongkut's University of Technology North Bangkok with responsibility for human resources development, technological technology, and industrial development, as well as the hub of academic services for government agencies, industrial sector, private sector, independent organizations, and communities. In addition, the Office of Technology Development for Industry is also responsible for building a cooperative network with several agencies in order to develop the national economy and realize the importance of workforce development with metacognition, literacy, and self-adjustment who can obtain opportunities from digital technology and innovations. This workforce consists of juveniles, skillful labor in production and service industries, teachers, digital students, digital workers who want to improve their skills, and general people who are interested in self-development on digital skills and VR to be ready for the digital economy and society that is consistent with the national strategy on building competitive capability under the 20-Year National Strategy.

From the importance of the potential development of a workforce for the digital era with quality, knowledge, skills, and attributes that will drive Thailand to achieve the goals of the National Digital Economy and Society Development Plan and Policy (B.E. 2561 – 2580) as well as the vision to drive Thailand "to a digital economy with dynamics based on society with metacognition, literacy, and a workforce that can adjust themselves and gain opportunities from digital technology, the researcher was interested in studying the guidelines for developing the potential of educational personnel on Virtual Reality (VR) technology as the mechanism to improve the potential of the digital workforce as defined by the Master Plan for digital economy as well as enabling them to have future skills and abilities that are necessary for improving Thai technology to the industrial era of future production.

Objectives of the Research

1. To study the guidelines for developing the potential of educational personnel in Virtual Reality (VR) technology.

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2. To analyze the confirmatory factors for developing potential of educational personnel in Virtual Reality (VR) Technology.

Hypothesis

The guidelines for developing the potential of educational personnel on Virtual Reality (VR) technology included three factors: knowledge, skills, and attributes, all of which were grouped together under the same major factor.

RESEARCH METHODOLOGY

Populations and Sample Group

The populations and sample group of this research were participants of the Pioneer Project for *"Developing Learning Center and Virtual Reality (VR) Curriculum for Students"* of the Broadcasting and Telecommunications Research and Development Fund for the Public Interest (BTFP) who applied to participate in this project from October 10th, 2019 to November 15th, 2019. The sample size consisted of 210 samples based on the findings of Krejcie & Morgan (1970) obtained by using purposive sampling. They voluntarily replied to the questionnaire of this research project as well (Office of Technology Development for Industry, 2020).

Research Variables

1. Structural variables consisted of 3 factors, including knowledge, skills, and attributes.
2. Indicator variables consisted of: 1) 6 indicators on knowledge; 2) 7 indicators on skills; and 7 indicators on attributes.
3. The research duration started on March 1st, 2021 and ended on August 31st, 2021.

Area Boundaries

The research area was Virtual Reality Startup Center, Office of Technology Development for Industry, King Mongkut's University of Technology North Bangkok.

Research tool was questionnaire on the Guidelines for Developing Potential of Educational Personnel on Virtual Reality (VR) Technology. The researcher studied on 20-Year National Strategy, National Digital Economy and Society Development Plan and Policy (B.E. 2561-2580), Master Plan for Digital Economy (B.E. 2561-2565), and Plan on Higher Education for Producing and Developing Workforce of Thailand B.E. 2564-2570 for developing research tool.

A developed questionnaire was a 5-rating scale questionnaire based on the Likert scale, consisting of the highest level, high level, moderate level, low level, and lowest level. The mean of the criteria for interpreting values ranged from 4.51-5.00 for the highest level, 3.51-4.50 for high level, 2.51-3.50 for moderate level, 1.51-2.50 for the low level, and 1.00-1.50 for the lowest level (Srisa-ard, 2002). This questionnaire was divided into 3 dimensions including knowledge, skills, and attributes with Index of item objective congruence (IOC) ranging from 0.80-1.00.

Data Collection

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The researcher collected data from the participants of the Pioneer Project for *"Developing Learning Center and Virtual Reality (VR) Curriculum for Students"* by using 210 questionnaires in the form of e-documents that were sent to participants and they were monitored personally. The sample group returned 210 questionnaires that were calculated to be 100%.

Questionnaires obtained from data collected from the participants were inspected for correctness and completeness before recording feedback by using package software as data for analysis and conclusion.

Data Processing and Analysis

Opinions on the guidelines for developing potential of educational personnel on Virtual Reality (VR) technology by using basic statistics including percentage, frequency, and Standard Deviation.

Structural Equation Modeling (SEM) of second-order confirmatory factor analysis of potential development of educational personnel on Virtual Reality (VR) technology was analyzed and it was considered as analysis on importance level of variables with factors of each dimension. Factor loading, importance of 3 dimensions of factors (knowledge, skills, and attributes), and overview of 3 factors were analyzed.

RESULTS

From general information of respondents, it was found that most of them were males (77.14%) with the age ranged from 21-30 years (51.90%) and they were graduated in Bachelor Degree (53.81). Details are shown in Table 1.

Table 1
NUMBER OF PERCENTAGE ON GENERAL CHARACTERISTICS OF SAMPLE GROUP

General Characteristics of Sample Group	Number	Percentage
Gender		
Males	162	77.14
Females	48	22.86
Age		
Below 20 years old	22	10.48
21 – 30 years old	109	51.90
31 – 40 years old	49	23.33
41 – 50 years old	30	14.29
Educational Level		
Diploma or Equal	64	30.48
Bachelor Degree	113	53.81
Higher than Bachelor Degree	33	15.71
Total	210	100.00

Results of analysis on opinions towards guidelines for developing educational personnel on virtual reality (VR) technology in overview and in all dimensions.

The participants had opinions towards guidelines for developing educational personnel on Virtual Reality (VR) technology in an overview at a high level (with a mean of 4.35). When considering each dimension, it was found that the dimension with the highest potential was

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attributes (with a mean of 4.38), followed by skills and knowledge (with a mean of 4.35 and 4.21), respectively. Details are shown in Table 2.

Table 2
MEAN, STANDARD DEVIATION, AND OPINION LEVELS ON THE GUIDELINES FOR DEVELOPING EDUCATIONAL PERSONNEL ON VIRTUAL REALITY (VR) TECHNOLOGY

List of Evaluation	$\bar{X}$	S.D.	Opinion Levels
Knowledge	4.31	0.69	High
Skills	4.35	0.70	High
Attributes	4.38	0.59	High
Overview	4.35	0.64	High

Results of Analysis on Structural Equation Modeling (SEM) of Second-order Confirmatory Factor Analysis of Potential Development of Educational Personnel on Virtual Reality (VR) technology.

The results of the analysis of Structural Equation Modeling (SEM) of second-order confirmatory factor analysis of the potential development of educational personnel on Virtual Reality (VR) technology found that it consisted of 3 elements, i.e., knowledge, skills, and attributes and the model was consistent with empirical data with all statistical values, i.e., Chi-Square Probability Level – p=0.070 which was higher than 0.05, CMIN\DF as 1.166, that was lower than 3, GFI as 0.963 that was higher than 0.90, and RMSEA as 0.012 which was lower than 0.08. When considering factor loading (b), it was found that all values were positive with a size ranged from 0.70 to 1.00 and different from zero with a statistical significance of 0.001.

When considering the factor loading of each factor, it was found that knowledge was considered as the variable with the highest level of factor loading, i.e., the factor loading of knowledge on the basic concepts of Virtual Reality (VR) Technology and benefits obtained from applying to works in all fields, for example, medicine, education, trainings, entertainment, business, public relations and tourism, and other related fields (know1) was 0.87 with variance with factor on knowledge by 76% followed by knowledge on installation and use of Unity Game Engine, Unity Game Processor as well as display and Layout of Unity Program (know3) with factor loading of 0.85 and variance with factor on knowledge by 72%, knowledge on basic mathematics, algebra, geometric, calculus, and statistics for applying to develop programs (know4) with factor loading of 0.84 and variance with factor on knowledge by 71%, knowledge on basic programming languages, for example, C# (C-sharp) for games on Unity Editor (know2) with factor loading of 0.80 and variance with factor on knowledge by 64%, knowledge on application of theories, scientific and technological principles for designing programs and solving problems (know5) with factor loading of 0.74 and variance with factor on knowledge by 55%, and knowledge on code structuring, data structure, and processing algorithm with factor loading of 0.68 and variance with factor on knowledge by 46%, respectively.

For skills, the variable with the highest level of factor loading was skill on the use of digital technology and modern innovations for developing programs and responsible jobs (skill1) with factor loading of 0.95 and variance with factor on skills by 90% followed by skill on basic systematical thinking process for program writing and performance of assignments (skill2) with factor loading of 0.93 and variance with factor on skills by 87%, skill on analytical thinking and synthesis for developing programs and responsible jobs (skill3) with factor loading of 0.92 and variance with factor on skills by 85%, skill on critical thinking and problem solving (skill4) with factor loading of 0.92 and variance with factor on skills by 84%, skill on program writing with

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programming languages, for example, C-sharp: C#), Java, or other related programming languages (skill5) with factor loading of 0.87 and variance with factor on skills by 76%, skill on teambuilding and teamwork (skill6) with factor loading of 0.85 and variance with factor on skills by 73%, and skill on creativity and self-direction to search for new methods for progressing assignments (skill7) with factor loading of 0.82 and variance with factor on skills by 68%, respectively.

For attributes, the variables with the highest level of factor loading were having honesty, patience, discipline, responsibility, and punctuality (attr1) with factor loading of 0.85 and variance with factor on attributes by 72% and having courage, determination, and firmness on actions with clear working goals (attr4) with factor loading of 0.85 and variance with factor on attributes by 72% followed by having determination, proactive working, self-reliance, and good attitudes towards co-workers and assignments (attr6) with factor loading of 0.75 and variance with factor on attributes by 56%, having general knowledge, modernity, resourceful thinking, and imagination (attr2) with factor loading of 0.70 and variance with factor on attributes by 49%, having creative and enthusiasm in performing works and learning new things with readiness on self-development (attr3) with factor loading of 0.68 and variance with factor on attributes by 46%, having reasons, open mind, and abilities to work with other persons (attr5) with factor loading of 0.66 and variance with factor on attributes by 44%, and having good human relations, listen to opinions or suggestions of other persons with good interaction and communication (attr7) with factor loading of 0.60 and variance with factor on attributes by 36% respectively.

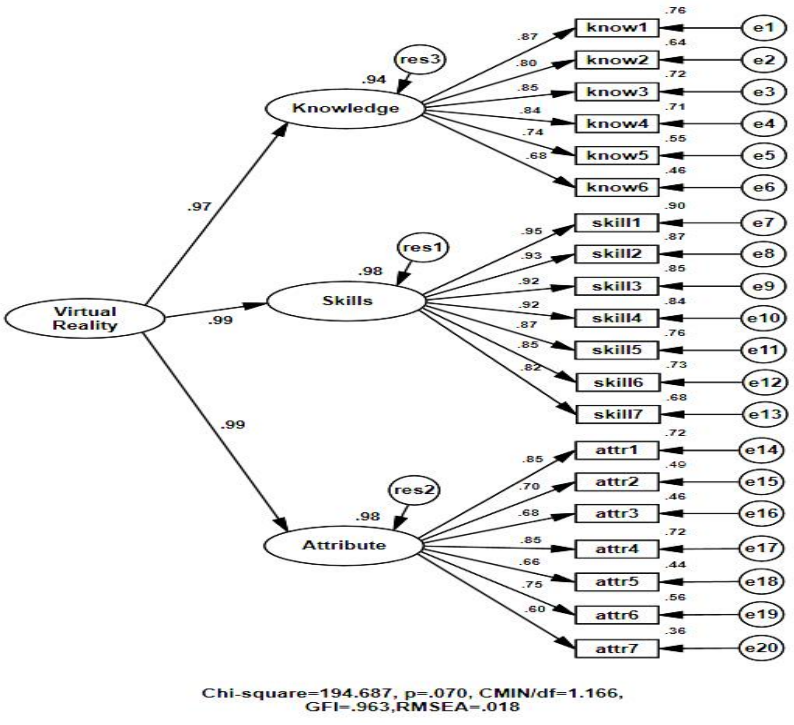

FIGURE 1
STRUCTURAL EQUATION MODELING (SEM) OF POTENTIAL DEVELOPMENT OF EDUCATIONAL PERSONNEL ON VIRTUAL REALITY (VR) TECHNOLOGY IN STANDARDIZED ESTIMATE MODE

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Table 3
STATISTICS OF ANALYSIS ON STRUCTURAL EQUATION MODELING (SEM) OF CONFIRMATORY FACTOR ANALYSIS OF POTENTIAL DEVELOPMENT OF EDUCATIONAL PERSONNEL ON VIRTUAL REALITY (VR) TECHNOLOGY

Variables	Factor Loading			t	R^2
	b	B	SE		
Dependent Variables					
The guidelines for developing educational personnel on Virtual Reality (VR) technology					
Independent Variables					
Knowledge	0.89	0.97	0.02	29.851*	0.94
Skills	1	0.99	0.01		0.98
Attributes	0.89	0.99	0.01	29.052*	0.98
1. Knowledge					
Knowledge on the basic concepts of Virtual Reality (VR) Technology and benefits obtained from applying to works in all fields, for example, medicine, education, trainings, entertainment, business, public relations and tourism, and other related fields (know1)	1	0.87	0.13		0.76
Knowledge on basic programming languages, for example, C# (C-sharp) for games on Unity Editor (know2)	0.9	0.8	0.18	23.143*	0.64
Knowledge on installation and use of Unity Game Engine, Unity Game Processor as well as display and Layout of Unity Program (know 3)	0.98	0.85	0.15	25.68*	0.72
Knowledge on basic mathematics, algebra, geometric, calculus, and statistics for applying to develop programs (know4)	0.96	0.84	0.16	25.324*	0.71
Knowledge on application of theories, scientific and technological principles for designing programs and solving problems (know5)	0.84	0.74	0.23	20.482*	0.55
Knowledge on code structuring, data structure, and processing algorithm (know6)	0.85	0.68	0.34	17.805*	0.46
2. Skills					
Skill on the use of digital technology and modern innovations for developing programs and responsible jobs (skill1)	1	0.95	0.05		0.9
Skill on basic systematical thinking process for program writing and performance of assignments (skill2)	0.95	0.93	0.07	43.389*	0.87
Skill on analytical thinking and synthesis for developing programs and responsible jobs (skill3)	0.93	0.92	0.08	41.112*	0.85
Skill on critical thinking and problem Solving (skill4)	0.95	0.92	0.08	40.797*	0.84
Skill on program writing with programming languages, for example, C-sharp : C#), Java, or other related programming languages (skill5)	0.9	0.87	0.13	33.676*	0.76
Skill on teambuilding and teamwork (skill6)	0.88	0.85	0.14	31.667*	0.73
Skill on creativity and self-direction to search for new methods for progressing assignments (skill7)	0.85	0.82	0.17	28.924*	0.68
3. Attributes					
Have honesty, patience, discipline, responsibility, and punctuality (attr1)	1	0.85	0.15		0.72
Have general knowledge, modernity, resourceful thinking, and imagination (attr2)	0.83	0.7	0.28	18.348*	0.49
Have creative and enthusiasm in performing works and learning new things with readiness on self-development (attr3)	0.89	0.68	0.29	17.426*	0.46
Have courage, determination, and firmness on actions with clear working goals (attr4)	0.99	0.85	0.15	24.763*	0.72
Have reasons, open mind, and abilities to work with other persons (attr5)	0.77	0.66	0.29	16.951*	0.44
Have determination, proactive working, self-reliance, and good attitudes towards co-workers and assignments (attr6)	0.87	0.75	0.23	20.105*	0.56
Have good human relations, listen to opinions or suggestions of other persons with good interaction and communication (attr7)	0.7	0.6	0.34	14.794*	0.36

Note: *. p = < 0.001, t=1.946

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From the hypothesis, it was found that these 3 factors were under the same major factor with a factor loading ranged from 0.97 to 0.98 in descending order, i.e., skills, attributes, and knowledge, with factor loadings of 0.98, 0.98, and 0.97, respectively. Details are shown in Table 3 and Figure 1.

SUMMARIZATION AND DISCUSSION OF THE RESEARCH FINDINGS

1. The participants had highly positive opinions towards the guidelines for developing educational personnel on Virtual Reality (VR) technology in overview and in all dimensions, including knowledge, skills, and attributes that may be caused by any action. In addition, to create Virtual Reality (VR) technology, there must be important factors in knowledge, skills, and attributes that are co-factors influencing success, effectiveness, and efficiency of action. To develop the potential of personnel, they were required to be developed in 3 dimensions. This is in line with the theory of competency of McClelland (1973), who defined the term, "competency" as "a behavioral attribute caused by knowledge, abilities, skills, and other attributes enabling personnel to contribute outstanding work in an organization". Such a person would express their competency in the form of thinking and behavior on the job, influencing the performance of each person with consecutive self-development that would lead to standard success or higher success than that defined by the organization (Office of the Civil Service Commission, 2010). When educational personnel on Virtual Reality (VR) technology had readiness on knowledge, skills, and attributes, it was considered valuable and important human capital for educational institutions, government agencies, or places of business to develop a workforce on Virtual Reality (VR) to have quality in driving the national economy. This is consistent with the findings of Hargis & Bradley III. (2011), who investigated strategic human resource management in small and growing businesses: aligning valuable resources. The results showed that human capital (i.e., the knowledge, skills, and abilities of employees) is one of the primary factors a business can rely on to differentiate their products or services and build a competitive advantage.
2. The Guidelines for Developing Educational Personnel on Virtual Reality (VR) Technology consisted of 20 indicators covering 3 elements, including:
    a. Knowledge: This factor consisted of 6 indicators with the order of factor loading in descending order, including knowledge on the basic concepts of Virtual Reality (VR) Technology and benefits obtained from applying it to work in all fields, for example, medicine, education, training, entertainment, business, public relations and tourism, and other related fields followed by knowledge on the installation and use of Unity Game Engine, Unity Game Processor as well as display and Layout of Unity Program, knowledge on basic mathematics, algebra, geometric, calculus, and statistics for applying to developing programs, knowledge on basic programming languages, for example, C# (C-sharp) for games on Unity Editor, knowledge on the application of theories, scientific and technological principles for designing programs and solving problems, and knowledge on code structuring, data structure, and processing algorithm, respectively. These above indicators were important and related to direction of workforce development in production and service industries for driving Thailand 4.0 in order to build economic and social system in Thailand that was driven by innovations to relieve Thailand from middle-income trap, inequality trap, and imbalance trap, Consequently, Thai people would obtain opportunities on good quality education with modernity, and ability to stand on the world stage proudly (Office of the National Economics and Social Development Council, 2017). This is in line with Thongprasit (2020) who researched the Approaches for competency development of workforces in the manufacturing and service industry sector, eastern economic corridor (EEC): A case study of industrial land in Rayong province in Thailand. The results showed that Establishment administrators in new target industries (S-Curve) Eastern Economic Corridor (EEC) of industrial land in Rayong Province had opinions on approaches for competency development of workforces in the manufacturing and service industry sector, Eastern Economic Corridor (EEC): a case study of industrial land in Rayong Province, overall and in every aspect, at a high level. When considering each aspect, it was found that: in terms of knowledge, opinions were at a high level on all items, and the priority could be sorted in descending order as (1) computer drawing with a programmable logic controller (PLC), industrial robots, followed by (2) artificial intelligence, development of software to provide

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services and links to manage Big Data, Data Analytics, Predictive, Management Systems (3) Electronic Systems (4) Computer Drawing with CAD, CAM, CNC programs (5) Sensors and actuators, electrical systems, hydraulics, (6) welding (welders and welding robot control), and (7) pneumatic systems.

b. Skills: This factor consisted of 7 indicators with order of factor loading in descending order including skill on the use of digital technology and modern innovations for developing programs and responsible jobs followed by skill on basic systematical thinking process for program writing and performance of assignments, skill on analytical thinking and synthesis for developing programs and responsible jobs, skill on critical thinking and problem solving, skill on program writing with programming languages, for example, C-sharp : C#), Java, or other related programming languages, skill on teambuilding and teamwork, and skill on creativity and self-direction to search for new methods for progressing assignments, respectively. This is In line with Sinlarat (2014) who mentioned on skills of the 21st century that occurred skills consisted of various thinking groups and analytical groups. Skill on technology (Computing and ICT Literacy) was another necessary skill related to modern technology that must be learned and used efficiently by students and modern people in the 21st century, especially skills related to news and information that have been developed rapidly and extensively. This is in line with Ministry of Higher Rducation, Science, Research, and Innovation (2018) which presented critical thinking skills as the ability that digital citizens must be skillful consisted of advanced metacognition skill, for example, critical thinking skills that were necessary for selection, classification, analysis, interpretation, and understanding on news and information with knowledge and skills in digital environment, digital knowing for becoming good users, good persons who understood contexts, and good digital content creators in digital environment. This is also in line with the 1st strategy of Master Plan for Digital Economy (B.E. 2561 - 2565) to develop workforce to digital era with emphasis skills for general people by promoting personnel and specialist on digital technology and innovations as well as reinforcing digital skills for general people (Office of the National Digital Economy and Society Commission, 2018; 2020; Wankong, 2016). This is in line with Thongprasit (2022) researched the Approaches for competency development of workforces in the manufacturing and service industry sector, eastern economic corridor (EEC): A case study of industrial land in Rayong province in Thailand. The results showed that Regarding the skills factor, it was found that establishment administrators from new target industries (S-Curve) of the Eastern Economic Corridor (EEC) in the industrial land in Rayong Province had opinions on approaches for competency development of workforces in the manufacturing and service industry sector, Eastern Economic Corridor (EEC): a case study of industrial land in Rayong Province, in terms of overall and each individual skills at a high level when sorted in descending order: 1) Specific operational skills of the target industry 2) Advanced thinking skill 3) Digital skill 4) Foreign language communication skill 5) Operational collaboration skill 6) Organizational communication skill and 7) Skills for adaptation and flexibility to situations respectively.

c. Attributes: This factor consisted of 7 indicators with the order of factor loading in descending order, including having honesty, patience, discipline, responsibility, and punctuality, and having courage, determination, and firmness in actions with clear work. There were attributes hidden in a person which could drive such a person to have good performance or performance that met with defined criteria (McClelland, 1973) followed by having determination, proactive working, self-reliance, and good attitudes towards co-workers and assignments. This is in line with Khajohnsak Buaraphan (2012) who said that the learning concept of the 21st century on communication and collaboration consisted of clear communication, i.e., the ability to express thinking efficiently through verbal communication and non-verbal communication under various forms and contexts, efficient listening for making understanding of meaning, knowledge, values, attitude, and intention, and the ability to communicate for different purposes. Collaboration with other persons refers to the ability to work with various teams efficiently and pay respect to diversity with flexibility and willingness to compromise in order to achieve common goals, be able to be responsible for teamwork and value the participation of each team member. The following attributes were having general knowledge, modernity, resourceful thinking, and imagination, having creative and enthusiasm in performing works and learning new things with readiness on self-development, having reasons, open mind, and abilities to work with other persons, and having good human

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relations, listen to opinions or suggestions of other persons with good interaction and communication, respectively. This is in line with McClelland (1973) who defined *"competency"* as *"a behavioral attribute caused by knowledge, abilities, skills, and other attributes enabling personnel to contribute outstanding work in an organization"* that was necessary for the performance of an individual or attribute expressed by an individual behaviorally caused by knowledge, skills, and attributes. Consequently, such an individual would be able to contribute work under his/her responsibilities efficiently that met with defined criteria or higher criteria than other persons who performed operations under the same line.

General Suggestions

1. Government agencies or educational institutions should apply data obtained from this research to establish policies for planning on improvement of workforce potential on Virtual Reality (VR) technology to have quality in driving national economy.
2. Educational institutions should apply data obtained from this research to develop instructional curriculum and training programs to produce workforce on Virtual Reality (VR) technology to improve vocational standards in the era of future digital technology to obtain quality and acceptance.
3. Educational institutions should apply data obtained from this research to develop instructional curriculum and training programs to produce workforce on Virtual Reality (VR) technology in digital industry and other industries to be effective with higher competitive capability on national economy.
4. Places of business and educational institutions should integrate cooperation based on data obtained from this research to develop knowledge, and skills of workforce on Virtual Reality (VR) technology to have demanded abilities and competency for responding to demands of new industries in Thailand, especially in Eastern Economic Corridor (EEC).

Suggestions for Further Researches

Government agencies, places of business, and educational institutions should integrate cooperation to conduct researches, assessment, and monitoring on development of abilities, and competency of workforce on Virtual.

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