# HARD AND SOFT SKILLS AFFECTING THE WORK PERFORMANCE OF GRADUATES

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## Abstract

The objective of this research was to study the causal variables of hard and soft skills (3Rs8Cs) affecting the work performance of graduates. This study focused on exploring graduates of King Mongkut's Institute of Technology Ladkrabang. The population included heads and supervisors of organizations or graduate user agencies, both public and private, of graduates of King Mongkut's Institute of Technology Ladkrabang who graduated in the academic year 2018-2020, totalling 5,624 units. From the multiple regression analysis, the results revealed that the hard skills including critical thinking and problem solving, creativity and innovation, corporate and entrepreneurial spirit, communications, information and media literacy, computing and ICT literacy, and curiosity and imagination had a statistically significant positive impact on the work performance of graduates. All six hard skills could jointly forecast and explain 72.9 percent of the variations in the work performance of graduates. The results of multiple regression analysis of soft skills including self-awareness, managing emotion, self-regulation, recognizing emotions in others, and social skills had a statistically significant positive impact on the work performance of graduates. All five soft skills could jointly forecast and explain 71.0 percent of the variations in the work performance of graduates.

**Keywords:** Hard Skills, Soft Skills, Work Performance

## Introduction

The 21st century is experiencing rapid change in many aspects of the world. The lives of people around the world are affected by changes in the economy, society, environment, and communication technology, so they must adapt as necessary. The advancement of information technology enables all regions of the world to communicate and receive information quickly through modern technology. According to the rapidly changing world conditions, graduates in this era have to develop themselves in order to change in terms of living, learning, family, as well as various risks that reflect society and modernity as a whole. Graduates must adapt to new situations in order to live with quality and must possess the knowledge and skills to cope with the changes that arise. To be able to adapt, it is necessary to develop learning and life skills (Panich, 2012) and it is a must learn new skills to survive in society. Bernie Trilling cultural Understanding, the committee of the Alliance for 21st Century Skills, presented the concept of 21st century skills as the equation of 3Rs x 7Cs = 21st Century Skills. 3R is Reading, wRiting and (a)Rithematic. The 7Cs include Critical Thinking and Problem Solving, Creativity and Innovation, Cross cultural Understanding, Collaboration, Teamwork and Leadership, Communications, Information, and Media Literacy, Computing and ICT Literacy, Career and Leaning Skill (Benner et al., 2010). In addition, the Office of the Higher Education Commission (2018) stated that 21st century learning attributes and skills (3Rs8Cs) consist of 3Rs: Reading, Writing and Arithmetic's and 8Cs: Critical Thinking and Problem Solving, Creativity and Innovation, Cross-Cultural Understanding, Collaboration, Teamwork and Leadership, Communications, Information and Media Literacy, Computing and ICT Literacy, Career and Learning Skills, Compassion. The skills that graduates must have are both Hard Skills, which are skills or abilities used in working in each career that can be measured and evaluated in a concrete way, such as reading, writing, calculating, accounting, playing sports, programming, drawing, research, cooking, use of various tools, etc. and Soft Skills are individual skills or abilities that are difficult to measure or evaluate as grades, such as creativity, leadership, time management, human relations, adaptation, emotional control, etc. From the review of relevant literature Hard skills include 1) Critical Thinking and Problem Solving 2) Creativity and innovation 3) Corporate and Entrepreneurial Spirit 4) Communications, Information, and Media Literacy 5) Computing and ICT Literacy, and 6) Curiosity and imagination (HS6) (Benner et al., 2010; Office of the Higher Education Commission, 2018; Sinlarat, 2017). The soft skills consisted of 1) Self-Awareness 2) Managing Emotion 3) Motivation Oneself 4) Recognizing Emotions in Others 5) Social Skill (Goleman, 1995) which will lead to graduate performance efficiency, consisting of 1) Quality of work, 2) Quantity of work, 3) Time and 4) Cost (Petersen & Plowman, 1953). From the above-mentioned background and significance, the researcher initiated the study "Hard and Soft Skills Affecting Work Performance of Graduates" with two-fold objectives as follows: 1) to study the impact of hard skills on the work performance of graduates and 2) to study the impact of soft skills on the work performance of graduates in order to apply the results of the study to improve skills for graduates both in terms of hard skills and soft skills that lead to their performance in the future.

## Literature Review

### Hard Skills

The METIRI Group proposed a conceptual framework for 21st century learning in 2003 after a two-year research entitled "enGauge 21st Century Skills", which is essential skills for learners, general people and people working in the information technology era, and grouping skills into 4 groups: 1) Knowledge and competence in the digital age which includes basic knowledge of language skills especially in English and math abilities which is necessary for work and learning; scientific knowledge which is an important basis for thinking and decision-making

processes which affects the coexistence of individuals in society, Economic knowledge which makes understanding of economic problems, cost- effectiveness, cost- effectiveness and relevant public policy changes; Technology knowledge, information and communication media, data usage and technology use for maximum efficiency and effectiveness; Multicultural competence and global awareness, which is an understanding of connections and interactions at the individual, social, national and international levels. 2) Innovative and creative thinking is the ability to guide oneself by setting goals, planning and managing efforts to achieve them, being able to adjust one's thoughts, attitudes or behaviors to current and future situations for the better, and being able to manage complexity, such as being able to accomplish many tasks at the same time, working under limited resources, being creative, curious, taking risks to learn, not afraid of making mistakes, and high- level thinking and reasoning. 3) Effective communication is an important skill that will lead to success in a knowledge- based society. This includes the ability to work in teams, interpersonal interactions, personal and social responsibility, civic responsibility, communication and interaction. 4) A high level of productivity is an important skill associated with success in professional life. This skill includes the ability to prioritize, plan and manage for achievement, effectively use IT equipment, programs, networks and accessories by communicating, collaborating and solving problems to increase the productivity of 21$^{st}$ century work and create high quality output.

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**Soft Skills**

Soft skills refer to characteristics related to communication skills, as well as about personal attributes that enhance individual interaction as well as job performance and career prospects. And more importantly is the process of transferring soft skill training. Soft skills refer both to intrapersonal skills, such as the 6072 ability to manage oneself, and interpersonal skills, such as managing interactions with others (Botke et al., 2018). Similarly soft skills commonly called people skills are not easy to teach, although they are needed in leader-follower interaction.

Goleman (1995) defined soft skills as the ability to recognize one's own and others' feelings, motivate and manage one's own and others' emotions and have a good relationship with others by dividing soft skills into 5 major components, which are 1) Self- Awareness or Knowing One's Emotion. It is the ability to truly recognize and understand one's own feelings, thoughts and emotions, to evaluate oneself clearly and honestly, to have confidence, to know one's strengths and weaknesses, to be honest, speak and keep one own word, have ethics, be mindful, understand oneself; 2) Managing Emotion or can be called Self-Regulation is the ability to deal

with the emotions that arise appropriately; 3) Motivation Oneself is the ability to motivate oneself, known as achievement motivation , affiliation motivation , positive thinking, being able to bring one own emotions and feelings to create the power to do things and be the power to encourage oneself to think and act creatively; 4) Recognizing Emotions in Others refers to the ability to understand other people's feelings, have empathy, take care of others' feeling, have a service orientation, and be able to express emotions appropriately; 5) Handling Relationships is one of the social skills. It is the ability to be aware of the emotions of others, an emotional skill that will lead to good relationships with others that will result in leadership. This kind of ability will consist of good communication and conflict management (Goleman, 1995). For this research, the emotional skill variable based on the concept of Daniel Goleman was used.

**Work Performance**

Millett (1954) defined efficiency as performance that results in satisfaction and profit from performance. Satisfaction means service satisfaction to the people based on equitable service, timely service, adequate service, continuous service progressive service etc. Woodcock (1989) stated that the performance of employees in organizations must be expressed by 11 important behavioral factors: 1) Having clearly set objectives and goals together 2) Clearly specifying the responsibilities of employees in the organization 3) Exposure and confrontation 4) Support and trust 5) Cooperation and conflict 6) Work methods and right decision making 7) Appropriate leadership 8) Review of performance and work methodology 9) Self and employee development 10) Good intergroup relationships 11) Good communication. According to Petersen & Plowman (1953), the components of performance are: 1) Quality: the quality of the work that must be of high quality. It meets the required standards, quickly and without errors. The quality of work must create satisfaction and benefit the organization according to the specified goals. 2) Quantity: the workload performed must meet agency expectations, depending on demand and satisfaction Therefore, the organization must manage time according to the amount of work to achieve the set goals quickly and in a timely manner. 3) Time: The time spent on the operation must be in a reasonable principle. The organization must develop good operational techniques to facilitate the operation in order to get the work without errors and on time. 4) Cost: Organizations must spend consistently and appropriately with the benefits to be gained and must prioritize the most efficient use of resources to reduce costs and maximize revenue and profitability. Efficiency in terms of operating expenses or production costs, including the use of available financial resources, people, materials, technology with efficiency, cost effectiveness and minimal loss. In this study, the researcher used the Petersen & Plowman performance variables.

**Hard Skills and Work Performance**

Wongwiwattana (2017) conducted a study on the development of 21$^{st}$ century learning skills to enhance the performance effectiveness of convention hotel staff in Thailand, the results of the study found that, there were seven 21$^{st}$ Century Learning Skills that could enhance the convention hotel staff's performance and there were four effectiveness components which resulted from those learning skills., Limna et al. (2022) conducted a study on The Relationship Between Twenty-First-Century Learning Model (4Cs), the results of the study found that, Student Satisfaction and Student Performance-Effectiveness, student performance-effectiveness. It indicates that communication, critical thinking, collaboration, and creativity significantly influence student satisfaction. Moreover, communication has the most significant influence on student performance-effectively, followed by collaboration and creativity. Only critical thinking does not considerably influence student performance-effectiveness. The educational leaders, program directors and teachers should pay attention to the twenty-first-century model (4Cs) to increase student satisfaction and performance-effectiveness. Preechanontakul (2020) conducted a study on century skills of school administrators the

academic administrations of schools under the office of vocational commission in Rayong, Chonburi and Trat provinces, the results of the study found that, 1) the skills of the school administrators in the 21$^{st}$ century showed a high positive relationship with the academic administration at the statistically significant level of. 01, and 2) since the opinions on the skills of the school administrators in the 21$^{st}$ century affecting the academic administration was positive at the statistically significant level of .01, the predictive equation could be created in the form of a raw score, $\hat{Y} = 0.75** + 0.82** X$.

According to the synthesis of literature mentioned above, it led to hypothesis H1a-H1f as follow:

H1a: hard skill regarding critical thinking and problem solving has positive effects on creating work performance of graduates.

H1b: hard skill regarding creativity and innovation has positive effects on creating work performance of graduates.

H1c: hard skill regarding corporate and entrepreneurial spirit has positive effects on creating work performance of graduates.

H1d: hard skill regarding communications, information, and media literacy has positive effects on creating work performance of graduates.

H1e: hard skill regarding critical thinking and problem solving has positive effects on creating work performance of graduates.

H1f: hard skill regarding curiosity and imagination has positive effects on creating work performance of graduates.

**Soft Skills and Work Performance**

Chala & Bouranta (2021) conducted a study on Soft Skills Enhance Employee Contextual Performance: The Case of the Maritime Industry. It was found that teamwork, problem-solving, adaptability and communication positively affect employee contextual performance. In addition, it was confirmed that problem-solving skills are related to employee income. This study contributes to the literature, defining which soft skills are significant factors in employee contextual performance and income. There is little literature exploring these relationships, and even fewer studies have focused on the maritime industry. This paper highlights the importance of employees developing transferable soft skills to perform effectively in the workplace. Proyrungroj & Chansom (2021) conducted a study on Soft Skills Factors Affecting to Workers Performance Effectiveness of Y Generation Group in Bangkok, the results revealed that gender, educational level different and soft skills included adaptability, teamwork, creativity, and persuasion skills; they could affect the efficiency of performances by developing soft skills in an organization to support some abilities and potential during the performances and the improvement. In addition, the company perspectives on soft skills could be improved to grow and enhance operational efficiency in organizations. Saihu & Rhian (2022) conducted a study on the effect of soft skill, motivation and Job satisfaction on employee performance through organizational commitment, the results showed that Soft Skills, Motivation and Work Goals on Employee Performance through Organizational Commitment all variables had a significant effect. According to the synthesis of literature mentioned above, it led to hypothesis H2a-H2e as follow:

H2a: soft skill regarding self-awareness has positive effects on creating work performance of graduates.

H2b: soft skill regarding managing emotion has positive effects on creating work performance of graduates.

H2c: soft skill regarding motivation oneself has positive effects on creating work performance of graduates.

H2d: soft skill regarding recognizing emotions in others has positive effects on creating work performance of graduates.

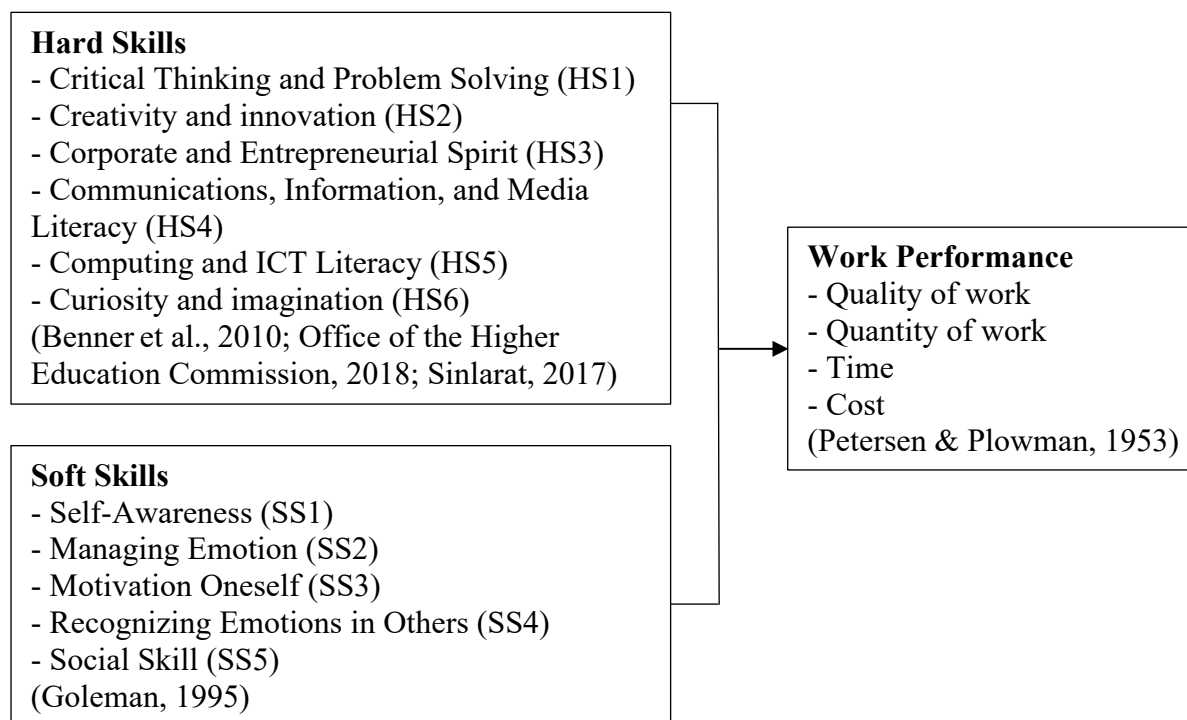H2e: soft skill regarding social skill has positive effects on creating work performance of graduates.



**Figure 1** Research Conceptual Framework

## Research Methodology

This research aimed to study the variables of hard and soft skills that affect the work performance of graduates by studying with graduates of King Mongkut's Institute of Technology Ladkrabang. The population included heads and supervisors of organizations or graduate user agencies, both public and private, of graduates of King Mongkut's Institute of Technology Ladkrabang who graduated in the academic year 2018-2020, totalling 5,624 units (Office of Strategic Management, King Mongkut's Institute of Technology Ladkrabang, 2022). The sample size was calculated using the formula of Krejcie & Morgan at a level of error of 0.05, until obtaining the sample size of 355 cases. A questionnaire created upon the purpose, conceptual framework and operational definition was used as a tool for quality assurance research, consisting of 1) Content validity by 3 experts. The index of consistency using the IOC technique (Index of Item-Objective Congruence) found that each aspect had a value between 0.67-1.00, which was considered consistent and could be used (Rovinelli & Hambleton, 1977). 2) The reliability test found that the value was 0.94, which had to be greater than 0.70 so it was acceptable (Hair et al., 2010) 3) The discrimination of power by means of correlation between questions and total scores of the whole questionnaire (Item-Total correlation) found that it was between 0.67-1.00.

Enter method of multiple regression analysis was used for data analysis, which can be written in the form of an equation as follow:

Equation 1 hard skills

$$HS = \beta_{01} + \beta_1 HS1 + \beta_2 HS2 + \beta_3 HS3 + \beta_4 HS4 + \beta_5 HS5 + \beta_6 HS6 + \varepsilon$$

Test of effects of hard skills regarding critical thinking and problem solving, creativity and innovation, corporate and entrepreneurial spirit, communications information and media literacy, computing and ICT literacy, and curiosity and imagination on creating work performance of graduates according to hypothesis 1a-1f.

Equation 2 soft skills
SS = ß02 + ß7 SS1 + ß8 SS2 + ß9 SS3 + ß10 SS4 + ß11 SS5 + ε
Test of effects of soft skills regarding self-awareness, managing emotion, motivation oneself, recognizing emotions in others, and social skill creating work performance of graduates according to hypothesis 2a-2e.

## Research Results

Analysis of correlation coefficients to determine the relationship between independent variables used in research found to be between 0.006-0.780, which is less than 0.80 (Cooper & Schindler, 2003 ). It showed that the independents had no relationship and could be used in prophecy. In addition, the Variance Inflation Factor (VIF) of independent variables was between 1.854-2.936, which did not cause Collinearity problems as shown in Table 1.

The multiple regression analysis of hard skills consisting of critical thinking and problem solving, creativity and innovation, corporate and entrepreneurial spirit, communications, information and media literacy, computing and ICT Literacy, and curiosity and imagination had correlated with the work performance of the graduates. When testing the hypothesis H1a-H1f, it was found that all hard skills had a statistically significant positive impact on the work performance of graduates (ß = 0.094, p < 0.05) (ß = 0.111, p < 0.01) (ß = 0.183 p < 0.01) (ß = 0.157, p < 0.01) (ß = 0.233, p < 0.01) (ß = 0.157, p < 0.01); therefore, hypothesis H1a-H1f was accepted. In this regard, skills and knowledge in all 6 areas were effective together in forecasting and explaining graduate performance efficiency of 72.9 percent. The details are as shown in table 2.

**Table 1** Correlation Between Variables Analysis

| Variables | HS1 | HS2 | HS3 | HS4 | HS5 | HS6 | SS1 | SS2 | SS3 | SS4 | SS5 | VIF |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Mean** | 4.60 | 4.36 | 4.51 | 4.37 | 4.50 | 4.39 | 4.46 | 4.43 | 4.50 | 4.43 | 4.50 | |
| **S.D.** | .422 | .443 | .473 | .475 | .484 | .490 | .500 | .446 | .477 | .470 | .470 | |
| **HS1** | | | | | | | | | | | | 2.650 |
| **HS2** | 0.045 | | | | | | | | | | | 1.854 |
| **HS3** | 0.733** | - 0.006 | | | | | | | | | | 2.448 |
| **HS4** | 0.157** | 0.645** | 0.061 | | | | | | | | | 2.245 |
| **HS5** | 0.693** | 0.129* | 0.658** | 0.175** | | | | | | | | 2.219 |
| **HS6** | 0.223** | 0.561** | 0.204** | 0.659** | 0.296** | | | | | | | 2.021 |
| **SS1** | 0.634** | 0.099 | 0.616** | 0.187** | 0.653** | 0.080 | | | | | | 2.132 |
| **SS2** | 0.251** | 0.560** | 0.280** | 0.606** | 0.302** | 0.690** | 0.204** | | | | | 2.600 |
| **SS3** | 0.596** | 0.157** | 0.624** | 0.233** | 0.652** | 0.261** | 0.624** | 0.247** | | | | 2.080 |
| **SS4** | 0.294** | 0.534** | 0.280** | 0.612** | 0.337** | 0.687** | 0.280** | 0.780** | 0.266** | | | 2.659 |
| **SS5** | 0.679** | 0.194** | 0.633** | 0.296** | 0.698** | 0.283** | 0.695** | 0.286** | 0.690** | 0.311** | | 2.499 |

Note: ** statistically significant at .01, * statistically significant at .05

**Table 2** Multiple regression analysis of hard skills and work performance of graduates.

| | **Work Performance** |
|---|---|
| 1) Critical Thinking and Problem Solving (HS1) | 0.094* (0.038) |
| 2) Creativity and innovation (HS2) | 0.111** (0.030) |
| 3) Corporate and Entrepreneurial Spirit (HS3) | 0.183** (0.032) |
| 4) Communications, Information, and Media Literacy (HS4) | 0.157** (0.031) |
| 5) Computing and ICT Literacy (HS5) | 0.233** (0.030) |
| 6) Curiosity and imagination (HS6) | 0.157** (0.028) |
| Adjusted $R^2$ | 0.729 |
| Maximum VIF | 2.650 |

Note: ** statistically significant at .01, * statistically significant at .05

The multiple regression analysis of soft skills consisting of Self- Awareness, Managing Emotion, Self- Regulation, Recognizing Emotions in Others, and social skills had correlated with the work performance of the graduates. When testing the hypothesis H2a-H2e, it was found that all hard skills had a statistically significant positive impact on the work performance of graduates ($ß = 0.094$, $p < 0.05$) ($ß = 0.111$, $p < 0.01$) ($ß = 0.183$, $p < 0.01$) ($ß = 0.157$, $p < 0.01$) ($ß = 0.233$, $p < 0.01$) ($ß = 0.157$, $p < 0.01$); therefore, hypothesis H2a-H2e was accepted. In this regard, the soft skills in all 5 areas were effective together in predicting and explaining the performance efficiency of graduates at 71.0 percent. The details are as shown in table 3.

**Table 3** Multiple regression analysis of soft skills and work performance of graduates.

|  | Work Performance |
| --- | --- |
| 1) Self-Awareness (SS1) | 0.085** (0.030) |
| 2) Managing Emotion (SS2) | 0.215** (0.037) |
| 3) Motivation Oneself (SS3) | 0.223** (0.031) |
| 4) Recognizing Emotions in Others (SS4) | 0.200** (0.035) |
| 5) Recognizing Emotions in Others (SS5) | 0.137** (0.034) |
| Adjusted $R^2$ | 0.710 |
| Maximum VIF | 2.659 |

Note: ** statistically significant at .01, * statistically significant at .05

## Conclusion and Discussion

The multiple regression analysis of hard skills consisting of critical thinking and problem solving, creativity and innovation, corporate and entrepreneurial spirit, communications, information and media literacy, computing and ICT Literacy, and curiosity and imagination had correlated with the work performance of the graduates. When testing the hypothesis H1a-H1f, it was found that all hard skills had a statistically significant positive impact on the work performance of graduates ($ß = 0.094$, $p < 0.05$) ($ß = 0.111$, $p < 0.01$) ($ß = 0.183$, $p < 0.01$) ($ß = 0.157$, $p < 0.01$) ($ß = 0.233$, $p < 0.01$) ($ß = 0.157$, $p < 0.01$); therefore, hypothesis H1a-H1f consistent with the study conducted by Wongwiwattana (2017) conducted a study on the development of 21st century learning skills to enhance the performance effectiveness of convention hotel staff in Thailand, the results of the study found that, there were seven 21st Century Learning Skills that could enhance the convention hotel staff's performance and there were four effectiveness components which resulted from those learning skills. It was also consistent with the research study of It was also consistent with the research study of Limna et al. (2022) conducted a study on The Relationship Between Twenty-First-Century Learning Model (4Cs), the results of the study found that, Student Satisfaction and Student Performance-Effectiveness, student performance-effectiveness. It indicates that communication, critical thinking, collaboration, and creativity significantly influence student satisfaction. Moreover, communication has the most significant influence on student performance-effectively, followed by collaboration and creativity. Only critical thinking does not considerably influence student performance-effectiveness. The educational leaders, program directors and teachers should pay attention to the twenty-first-century model (4Cs) to increase student satisfaction and performance-effectiveness. Preechanontakul (2020) conducted a study on century skills of school administrators the academic administrations of schools under the office of vocational commission in Rayong, Chonburi and trat provinces, the results of the study found that, 1) the skills of the school administrators in the 21st century showed a high positive relationship with the academic administration at the statistically significant level of .01, and 2) since the opinions on the skills of the school administrators in the 21st century affecting the academic administration was positive at the statistically significant level of 01, the predictive equation

could be created in the form of a raw score, $Y = 0.75** + 0.82** X$. therefore, hypothesis H1a-H1f was accepted. In this regard, skills and knowledge in all 6 areas were effective together in forecasting and explaining graduate performance efficiency of 72.9 percent.

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**Suggestions**

Based on the findings that skills and knowledge have a positive impact on the work performance of graduates, educational institutions should pay attention to skills and knowledge as follows:

1) Promote critical thinking skills and problem- solving or rational thinking processes with careful consideration by studying data, evidence, distinguishing what data is fact and what is opinion as well as considering the credibility of the information and making assumptions to find the cause of the problem and find a solution to that problem.

2) Foster creativity and innovation skills, which are skills that generate new ideas, develop new ways of working better, use hard skills to create new or better solutions to different problems.

3) Encourage Corporate and Entrepreneurial Spirit to be the ability to create and operate new businesses, as a key force in job and innovation creation including creating new conceptual frameworks and products, having occupational skills, gaining experience through practical occupational training which can be actually used in a career.

4) Promote communications, Information and Media Literacy or the ability to access, search, analyze and make use of reliable information media as well as being able to convey information clearly and effectively from the arrangement of ideas and communication perspectives, easy to understand, achieving work goals.

5) Promote computing and ICT Literacy or the ability to use computer programs, the use of information technology to access information effectively, including the ethical or legal use of information, critical and constructive evaluation of information.

6) Encourage curiosity and imagination or having imagination, adaptability, flexibility in operations, as well as having learning skills and having a curiosity in learning, researching, always finding new knowledge, be adaptable with the current situation that is changing rapidly. Based on the findings that soft skills have a positive impact on the work performance of graduates, educational institutions should pay attention to soft skills as follows:

1) Promote self-awareness skills, such as the ability to recognize and understand feelings of one's own emotions and needs, and effects on other people based on one's own feelings, emotions, and needs and to understand oneself in terms of strengths and points that should be developed.

2) Promote self-regulation skills, or the ability to manage emotions, irritability and stimulus, and be trusted. Maintain integrity and virtue, have a sense of responsibility for one's own actions, be thoughtful and have the ability to adapt.

3) Promote self-motivation skills or the ability to motivate oneself, known as Achievement Motive, Affiliation Motive to be optimistic, be able to bring one's own emotions and feelings to create the power to do things and to be the power to encourage oneself to think and act creatively.

4) Promote empathy skills or the ability to recognize other people's feelings, empathize with others, have a service mind, be able to express one's emotions appropriately.

5) Promote social skills or the ability of a person to behave in order to be able to live with other people or do things with others according to the objectives specified under the rules and regulations of that society appropriately.

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