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CONTENTS

Management and Social Sciences
The Relationship among Self-Efficacy, Teaching Presence, Learning Presence, Learner-Instructor Interaction, Satisfaction, and Recommendation Intention in South Korea

Haengnam Sung, Dae-Yul Jeong and Jae-Ik Shin 3029

Examining Factors Affecting Intention to Use E-Government - A Comparative Study between Vietnam and Korea-
Jae-Kul Lee, Seong Muk Choi, Myeon Jae Lee, Thi Thanh Thao Vo and Gwang Yong Gim 3037

The Effective Learning Strategies through the Analysis of Computer Learners' Problem-Solving Skills

Sungock Lee, Hangil Jung and Hoekyung Jung 3047

Estimation of Future Option Prices Corresponding to Underlying Asset Price Based on Current Market Option Prices

Jung-Youn Lee and Sun-Myung Hwang 3055

A National Comparative Study of the Effects of Webtoon Contents and Cooperative Characteristics on Intention to Use in Open Collaboration Platform

Wi-Man Kang, Myung-Bae Kim, Yeong Kyu Hwang, Sang-Hee Lee and Gwang Yong Gim 3065

The Bright Side and Dark Side of Retargeting Advertising

Miyea Kim and Kyungyoung Ohk 3073

Performance Evaluation Indicators for Social Enterprises in Korea: Future Policy Directions

Young-Chool Choi, Sang-Yeup Lee and Sang-Hyun Ju 3083

Integrative Modeling of Medical Tourism Industry's Competitiveness and a Moderating Effect of Related Experience

Min-sook Kim 3097

The Effect of SNS Tourism Information Service Quality on the Intention of Sharing Information: with a Focus on the Moderating Effect of Trust and
The Effective Learning Strategies through the Analysis of Computer Learners’ Problem-Solving Skills

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Abstract
The purpose of this study is to investigate the learners’ learning styles and strategies from different backgrounds, to analyze how these variables of individuals work on problem-solving skills and to achieve the ultimate goal of being employed as professionals in the computer field. The investigation was performed by 117 students learning computer at a vocational training institution. The questionnaire was composed of three parts-learning styles, learning strategies, including cognition/behavior regulations and problem-solving skills with problem solving confidence, approach-avoidance mode, and personal control ability.

There appeared the correlation between learning strategies and problem-solving skills. In detail, the three factors of learning strategies - inspection, management of time and study, and assistance pursuing strategy are found to affect problem-solving skills. These three meaningful strategies are practical and thus, can be applied to teachers and students in computer education.

Key Words: computer education, learning styles and strategies, problem-solving skills, computer education

1. Introduction
The 21st century is a knowledge-based society and IT technology is the Foundation of value added. IT based job training is open to graduates from not engineering related majors because many students are increasingly avoiding natural science and engineering. Many of the game developers and IT professionals of S/W and design fields are from vocational training courses on the Ministry of Employment and Labor [1]. The final objective of this paper is to present effective teaching and learning methods to identify the relationship between the computer learners’ learning strategies and problem-solving skills for a professional career in IT. The study of this paper is as follows:
- Research on types, motivations, and learning forms of computer learners.
- Research on learning strategies
- Research on problem-solving skills
2. Related Researches

2.1 Learning styles

Learning style refers to an overall concept including learning habits, methods and strategies. It has been described to explain individual differences in providing an optimal learning environment applying teaching assignments, teaching methods and assessments and also, encouraging learners’ academic achievement [2]. Learning style includes a variety of teaching methods and facilitating factors which can improve learning performance. Also, academic motivation is related to the dynamic power that actually leads learners to study [3-4]. The dictionary definition of a learning community is that individuals who voluntarily aim to study with each other and give new value to their learning and develop learning activities through this process [5].

2.2 Learning strategies

Zimmerman’s theory is the most widely used in the field of Self-regulated learning. According to his definition, “Self-regulation is not a mental ability or an academic performance skill; rather it is the self-directed process by which learners transform their mental abilities into academic skills.” “self-regulation of learning involves more than detailed knowledge of a skill; it involves the self-awareness, self-motivation, and behavioral skill to implement that knowledge appropriately[6].

Yangmyunghee tried to conceptualize of new self-regulation learning by collecting professors’ various thoughts and adding the need for motivation/emotional regulations[7].

2.3 Problem solving skills

Humans are to lead a professional life while living their own lives and many job skills are required for this purpose. The concept of professional competence is based on a variety of definitions across countries and researchers.

According to the definition of jeongcheolyoung, vocational skills are a totality of skills required to successfully perform a given job in professional life. Vocational Competencies are classified as vocational basic skills and job performance skills. First, vocational basic skills are basically required knowledge, skills, attitudes and experiences in order to successfully complete the job. Job performance is professional knowledge, skills and attitudes required to successfully carry out their duties in a particular occupation or profession [8].
The problem-solving skills are defined by various nations and scholars. The problem-solving skills are defined by various national and scholars. According to the UK QCA (Qualifications and Curriculum Authority), the problem-solving skills are the ability to devise an approach that can be processed to identify and evaluate the characteristics of the problem. Scottish SQA (Scotland Qualification Authority) defines it as the ability to evaluate with respect to analysis and planning, organization, implementation, review and problem-solving activities in order to solve the problem of problem-solving skills. Singapore WDA (Workforce Development Agency) is defined as the ability to evaluate and predict creating a solution to make the problem '[9]

3. Research Methods

The research was conducted at D institutions in Daejeon. Aimed at students belonging to the D institutions, a total of 119 surveys were conducted for 8 days from October 17, 2014, to October 24, 2014. Among 119 results, except two error data showing the missing value, 117 response result data were analyzed.

Learning style questionnaires used in the study are made of the total of 23 questions.

- Gender and age factor, the reason for taking the job training process, how you think applying for computer related jobs at your age, reason for not dropping out, portfolio preparation, feedback on overtime, thinking about competing with college graduates majored in computer fields and whether you have l coaches and role models for learning.

3.1 Questionnaires

Learning style questionnaires used in the study are made of the total of 23 questions.

- Gender and age factor, the reason for taking the job training process, how you think applying for computer related jobs at your age, reason for not dropping out, portfolio preparation, feedback on overtime, thinking about competing with college graduates majored in computer fields and whether you have l coaches and role models for learning.

3.2 Learning Strategy Investigation

To measure the student's learning strategies, Jeong-Mee-Kyung [10]'s self-regulating learning checks were used. Cognitive and learning where students' efficient scaling information, comprehension, the actual strategy used to organize measures. A subcomponent of the controlling factor whether the total consists of four is the reliability of the scale
cronbach α. 89, action control reliability is cronbach α. 90, and the whole question of reliability is cronbach was verified by α. 91. A measure of the response to each question was designed for the 6-point Likert (1 point = not at all, 6 points = very Yes)[11].

3.3 Problem Solving Skills

Problem solving skills are developed by Heppner and Peterson[12] scale (Personal Problem Solving Inventory; PSI). The reliability of the whole questions is cronbach α. 90. A measure of the response to each question was designed for the 6-point Likert (1 point = not at all, 6 points = very Yes).

3.4 Data Analysis Method

This study is analyzed using SPSS Statistics 20.0 program on the basis of the survey results in order to figure out learning strategies and problem-solving skills for each factor in the field of computer vocational training sector targeted adult men and women.

Humans are to lead a professional life while living their own lives and many job skills are required for this purpose. Job performance is professional knowledge, skills and attitudes required to successfully carry out their duties in a particular occupation or profession [8].

The problem-solving skills are defined by various national and scholars [9].

4. Findings and analysis

4.1 The Learning Strategy, Problem-Solving Abilities of Descriptive Statistics

![Fig. 1. Descriptive Statistics of Learning Strategies](image-url)
4.2 The Difference Verification of the Main Variables (Total of 23 Variables)

There are 2 types of variables after implementing signification test: meaningful variables and meaningless variables.

4.2.1 Insignificant Difference verification variables

- gender - age - reasons for choosing the computer education course - computer learners’ thoughts on age - reasons for not giving up during the course (learning strategies) - comments on overtime - will of competing with college majors (learning strategies) - coaching for learning (problem solving skills) - the role within a group study - selecting Leaders/Followers (learning strategies) - leader’s learning style (if you are a leader, How do you study?) - What kind of benefits do the leaders take? - How do you study under the leaders’ control? - What kind of benefits of learning as a group? - optimal number for a group study - preference for teaching methods (project type/lecture type) - feedback preference (Directly/indirectly) - who do you prefer to study with (teachers and colleagues) - How do the computer learners think about the roles of IT instructors?

4.2.2 Difference verification of meaningful variables

- reasons for not giving up during the course (problem solving skills): the reasons for not giving up are meaningful with 'intellectual curiosity', 'personal commitment' 'employment' factors in the order and the variable "pressure" is not related. - portfolio preparation will (problem solving skills) - will of competing with college majors (problem solving skills) - the experience of being heard of the law of 10,000 hours - the will of performing the law of 10,000 hours - coaching for learning (learning strategies) - having a role model - preference for a group study - the role within a group study - selecting Leaders/Followers (problem solving skills)
4.3 The correlation of Learning Strategies and Problem-Solving Skills

4.3.1 Difference verification of meaningful variables

According to the Pearson correlation coefficient, problem-solving skills and learning strategies are high correlation of 776. Therefore, learning strategies and problem-solving ability are statistically significant.

4.3.2 Difference verification of meaningful variables

Cognitive control and behavior control are high correlation of .662. They are statistically significant.

- The Impact of sub factors of cognitive control on behavior control

In order to study the specific effects that cognitive control influences on behavior control, sub factors (remember, cognitive strategies, demonstration and checking, planning) of cognitive control were set as independent variables, behavior control were set as dependent variables. Multiple regression analysis is conducted.

Multicollinearity happens when a tolerance is less than 0.1 or VIF is more than 10. Therefore, there is no multicollinearity. Overall, the model is statistically significant ($F = 25.698, p < .001$), the model summary $R$ squared is 47.9%. 'Check' and 'planning' factors are $p > .05$, they are meaningless. If you look at the beta value, 'cognitive strategies' is .575 and larger than .195 of 'demonstration and memories', thus, 'cognitive strategies' affects more than 'demonstration and memories'.

4.3.3 The Correlation of the Factors of Problem Solving Skills and Learning Strategies

Problem-solving skills are composed of 3 factors - 'confident', 'approach-avoidance approach' and 'personal control'.

4.3.3.1 Learning Strategy Factors and Their Impact on Problem-Solving Confidence

The model is statistically significant ($F = 12.114, p < .001$) and the regression model description is 47.3 percent. The factors that meet probability are 'check($p = .021$)', and 'time and study control($p = .027$)'. Both 2 factors are plus, thus, check', and 'time and study control' have a positive impact on problem solving confidence. The beta value of 'check ' is .303 and this is larger than .279 of 'demonstration and memories'. Therefore, 'check' affects more than 'demonstration and memories.'
4.3.3.2 Learning Strategy Factors and Their Impact on Approach-Avoidance Scheme

Models are statistically significant (F = 30.149, p < .001), and the regression model description is 69.1 percent. The factors that meet probability are 'check(p =.005)', 'time and study control(p =.000)', and 'pursuing assistance strategies(p =.017)'. The factors have a positive impact on the approach-avoidance scheme. The beta value of 'time and study control(.418)' is larger than 'check(.282)' and 'pursuing assistance strategies(.185)' . Therefore, 'time and study control' affects more than these 2 factors.

4.3.3.3 Learning Strategy Factors and Its Impact on Personal Control Ability

Models are statistically significant (F = 7.708, p < .001), and the regression model description is 36.3 percent. The factor that meets probability is 'time and study control(p =.001)'.

5. Conclusion

The most required things for computer learners for job are problem solving skills and learning strategies before occupational techniques. They can be obtained enough if there are strong will and motivation for vision. Gender and age obstacles do not matter a lot.

Also, learning strategies and problem-solving skills are important factors in the correlations. 'Check', 'Time and study control', 'pursuing assistance strategies' are key elements for problem solving skills. Teachers should design their class considering these factors, so the learners' learning strategies get activated under the best conditions.

The result of this study can be used in various fields. In order to generalize the results, there should be further studies at similar environments and curriculum from vocational institutions with a variety of research methods.

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Management and Social Sciences

The Relationship among Self-Efficacy, Teaching Presence, Learning Presence, Learner-Instructor Interaction, Satisfaction, and Recommendation Intention in South Korea  
Haengnam Sung, Dae-Yul Jeong and Jae-Ik Shin  
3029

Examining Factors Affecting Intention to Use E-Government - A Comparative Study between Vietnam and Korea  
Jae-Kal Lee, Seong Muk Choi, Myeon Jae Lee, Thi Thanh Thao Vo and GwangYong Gin  
3037

The Effective Learning Strategies through the Analysis of Computer Learners’ Problem-Solving Skills  
Sungock Lee, Hangil Jung and Hoekyang Jung  
3047

Estimation of Future Option Prices Corresponding to Underlying Asset Price Based on Current Market Option Prices  
Jung-Youn Lee and Sun-Myung Hwang  
3055

A National Comparative Study of the Effects of Webtoon Contents and Cooperative Characteristics on Intention to Use in Open Collaboration Platform  
Yeong Kyu Hwang, Sang-Hee Lee and Gwang-Yong Gin  
3065

The Bright Side and Dark Side of Retargeting Advertising  
Mieya Kim and Kyungyoung Ohk  
3073

Performance Evaluation Indicators for Social Enterprises in Korea: Future Policy Directions  
Young-Chool Choi, Sang-Yeap Lee and Sang-Hyun Ju  
3083

Integrative Modeling of Medical Tourism Industry’s Competitiveness and a Moderating Effect of Related Experience  
Min-sook Kim  
3097

The Effect of SNS Tourism Information Service Quality on the Intention of Sharing Information: with a Focus on the Moderating Effect of Trust and Satisfaction  
Dae Young Kwak  
3105

The Effect of Consumer Innovativeness on Smartphone Loyalty: A Causal Model Implication  
DaeEop Kim and Jae-Ik Shin  
3115

Network Analysis on Sustainable Development Research and its Implication  
Hyejiung Seo, Younchul Choi and Bookyung Cho  
3123

The Petrobras Scandal and the Need for Privatization  
Chae Chang Im, Jeong Ho Kim, Sayoung Choi  
3133

A study on Brazil corporate’s CSR Activity and Propensity of Tax Avoidance  
Chae Chang Im, Jeong Ho Kim, Jury Ko and Ji Min Lee  
3143

Curriculum Design for Improving the Track & Field Practical Skill Teaching Method  
Chun-ok Yu and Hwa-sook Choi  
3153

Analysis of Pupillary Responses in Cognitive Conflict Caused by Discrepant Events  
Eun-ae Kim, Eun-jin Kim and Il-ho Yang  
3161

Does South Korea can Handle Personality Education? Focusing on Research Trends and Agenda  
Jinhee Kim  
3169

The Relationship among Destination Image, Hospital Image, Attitude on K-Medical Tourism : Focusing the Chinese medical tourists  
Gwijeong Park, Jaesin Oh, Kihan Chung and Wonjong Kim  
3177

The Impact of the CSR Activities on Consumer Trust and Attitude toward the Distribution Company: The Moderating Effect of Involvement  
Gwijeong Park, Kihan Chung, Jaesin Oh and Wonjong Kim  
3185

A Study of Gender Identity among Sports Participants  
Byoungwook Ahn  
3199

Is Busan a Safe City for the Elderly ? - Evaluation Study of Safety Management for the Elderly Welfare Center  
Nam-Sook Kim  
3211

Agriculture and Engineering

Hangul Font Recommendation System Based on Geometry, Purpose, and Emotion Properties  
Hyun-Young Kim and Soon-Bum Lim  
3227

Study on Performance Evaluation of Dual Light-shelf system according to the Upper Reflection Board Variables  
Eunsu Park, Heangwoo Lee and Yongseong Kim  
3235

A Study on the Trend Analysis of Data Governance Research using Metadata Analysis  
Kyoung-ae Jung and Woo-Je Kim  
3243

A Study of Vehicle Driving Analysis System Based on OBD and Video Information  
Ming-Shou An and Dae-Seong Kang  
3251

A Symbol Table Verification Method for JavaScript Compiler using Reverse Translator on HTML5 Smart Virtual Machine  
Yunsoik Son, Seman Oh and Yangsun Lee  
3259

An Information Service Plan through the Improvement of the Design Deliberation Information System  
Hyun Ok  
3267

Research of the Optimum Conditions for Thermal Comfort of the Changing Room after a Bath  
Seonghoon Yoon and Yekyeong Shin  
3275

(Continued)