

Effects of Informatization Mind on Information Development Efforts and Academic Achievement of University Students Major in Sports

Seyun Kim*

**Assistant Professor, Department of Sport Management, Dankook University, Korea
seyunkim@dankook.ac.kr*

Abstract

The purpose of this study is to identify the impact of informatization minds of college students majoring in sports on information development efforts and academic achievement. Accordingly, a survey was conducted on 200 college students majoring in physical education at D University, and 197 students were selected as the final effective samples. Data processing was conducted using SPSS 23 for frequency analysis, reliability analysis, correlation analysis, and regression analysis. The results are as follows: First, recognition of the necessity of informatization education, a subfactor of the informatization mind, has a positive impact on informatino development efforts. Second, recognition of the necessity of informatization education, understanding and utilization of informatization concepts among sub-factors of informatization minds have a positive impact on the major learning achievement. Third, all the conversational factors in the informatization mind have a positive impact on study problem resolution. Fourth, information development efforts have a positive impact on the major learning achievement and the study problem resolution. Therefore, efforts are needed to increase the information mindset of college students major in sports.

Keywords: *Informatization Mind, Information Development Efforts, Academic Achievement, University Student Major in Sports*

1. Introduction

With the recent generalization of high-speed wireless Internet, it has evolved into a smart environment based on it. As a result, in the smart environment, various forms of high-speed Internet-based services that are not tied to existing broadcasting transmission methods are rapidly changing in daily life. Therefore, along with the development of advanced information technology, educational paradigms such as teaching and learning, teaching and learning methods, and educational contents are also changing. Due to the change in the education paradigm, efforts are being made to build a smart educational environment and utilize various teaching media based on innovative technology in classes ^[1]. The importance of a future-type learning environment suitable for student-centered teaching and learning methods is being emphasized more according to changes in times, social and educational fields ^[2].

Manuscript Received: March. 20, 2021 / Revised: March. 25, 2021 / Accepted: March. 28, 2021

Corresponding Author: seyunkim@dankook.ac.kr

Tel: +82-41-550-3825

Assistant Professor, Department of Sport Management, Dankook University, Korea

However, with this change, information has become a more important asset, and information will become more important in the future. And with this change in the environment, the individual digital divide is emerging. Failure to take advantage of these changes will lead to difficulties in daily and working life beyond the digital divide that emerges. As a result, universities are opening related majors and subjects to foster talented people with the problem-solving skills required by companies^[3]. It is expanded from eight SW-centered universities in 2015 to 40 this year, and 13 universities will establish SW colleges and universities and produce the first related graduates of SW-centered universities in 2019^[4].

Recently, the importance of constructivist teaching and learning has been emphasized, along with the importance of smart technology media-based learning, and the importance of cooperative learning has been further emphasized^{[5][6]}. Under these circumstances, universities should develop the ability to use knowledge and skills to lead various fields in the future, along with the ability needed to adapt to a changing society as a higher education institution^[7].

The government also establishes a master plan for national informatization every five years for the efficient and systematic promotion of informatization. The 6th National Informatization Framework Plan (2018-2022), established in December 2018, presents a national informatization vision for the next five years that maximizes opportunities for the 4th Industrial Revolution while allowing all citizens to enjoy the benefits of innovation^[8].

As such, the modern era is referred to as the Fourth Industrial Revolution and the Information Age. Individual performance will vary greatly depending on who responds more quickly to the environment and situation in the era of the fourth industrial revolution. In particular, what is important in this era is information capability, or information asset. Informatization ability and assets means the qualities, knowledge, etc. to be achieved in the acquisition and utilization of information required for individuals living in the informatization society and the utilization of information. This is also explained by the information mindset.

Furthermore, for college students to achieve their academic performance and develop their careers, in order to act as a positive citizen as a member of society, information mind and efforts to develop information are needed. Information development efforts mean how diverse and active university students are making efforts to acquire information in order to maximize their information utilization. These efforts are not just about regular education related to information acquisition by university students, but also the process of creating value through informatization through personal various efforts.

Accordingly, this study aims to scientifically analyze the relationship between informatization mind, informatization development efforts, and learning outcomes of college students majoring in sports and empirically reflect them in their learning strategies through informatization education and information utilization. This is a necessary task to clearly understand the information that should be prepared and actively utilized as individuals living in the era of the Fourth Industrial Revolution.

2. Research Method

2.1 Research Subjects

The study selected students attending D University as the population. The collection was conducted for 200 students from October 28 to November 15, 2019. The subjects were asked to respond to the survey after explaining themselves fully aware of the purpose of the study in advance. As a sampling method, convenience sampling method was used, and self-evaluation method was used, which is a method of reading and answering the survey contents by respondents themselves. After responding insincerely from the collected data or removing 3 copies deemed inappropriate as data, 197 copies were selected as the final valid sample and

processed the data. Specific characteristics of the subjects in this study are shown in Table 1.

Table 1. General characteristics of the study object

Factors		Person	%
Gender	Male	118	59.9
	Female	79	40.1
	Sum	197	100.0
Grade	1	78	39.6
	2	42	21.3
	3	32	16.2
	4	45	22.8
	Sum	197	100.0
Credit	C ~ C+	34	17.3
	B ~ B+	116	58.9
	A ~ A+	47	23.9
	Sum	197	100.0

2.2 Research Tools & Reliability Analysis

Research tools for measuring the variables set in this study used structured questionnaires. The questionnaire consisted of 14 questions of informatization mind (recognition of the necessity of informatization education, understanding and utilization of informatization concepts, and recognition of informatization risks), 10 questions of information development efforts, and 13 questions of academic achievement (major learning achievement, study problem resolution). Except for the questions to identify the general characteristics of the survey subjects, the information development mind, information development efforts, and the questions corresponding to academic achievement were all composed of a five-point Likert scale. Specifics are shown in Table 2.

An internal consistency test was conducted to analyze the reliability of the questionnaire used in this study. The reliability analysis used the Cronbach's α test, where .7 or higher is sufficient [9]. Therefore, as shown in Table 2, all factors have values of .7 or higher, and each factor has internal consistency. Specific reliability analysis results are shown in Table 2.

Table 2. Research Tools

Factors		Items	Cronbach's α
informatization mind	recognition of the necessity of informatization education	6	0.834
	understanding and utilization of informatization concepts	5	0.761
	recognition of informatization risks	3	0.791
information development efforts		10	0.770
academic achievement	major learning achievement	7	0.848
	study problem resolution	6	0.893

general characteristics	3	-
Total	40	-

2.3 Data Processing Method

In order to process data obtained in this process, statistical methods are as follows: First, frequency analysis was conducted to determine the characteristics of the subjects in the study. Second, simple and multiple regression analysis was conducted to analyze the causal relationship between informatization mind, efforts to develop informatization, and academic achievement.

3. Results

3.1 Correlation Analysis

Correlation analysis was conducted to verify the discriminant validity. The results are shown in Table 3. The discriminant validity can be said to have a discriminant validity if the correlation coefficient between each construct is not 1 in the 95% confidence interval ^[10]. And if the null hypothesis of correlation coefficient 1 is rejected, there is a discriminatory validity between each factor ^[11]. Therefore, the measures used in this study can be considered discriminative.

Table 3. Correlation analysis results

Factors	1	2	3	4	5	6
recognition of the necessity of informatization education	1					
understanding and utilization of informatization concepts	0.746**	1				
recognition of informatization risks	0.526**	0.608**	1			
information development efforts	0.325**	0.317**	0.195**	1		
major learning achievement	0.437**	0.464**	0.355**	0.244**	1	
study problem resolution	0.547**	0.556**	0.449**	0.379**	0.783**	1

** $p < .01$

3.2 Hypothesis Verification Results

The analysis of the effect of informatization mind on information development efforts shows that recognition of the necessity of informatization education ($\beta=0.203$, $p<0.05$) among the sub-factors of informatization mind have a significant effect, as shown in Table 4. It explains 11.9% of the factors in the on information development efforts.

Table 4. Effect of informatization mind on information development efforts

Factors	b	β	t
	1.755		5.520**
recognition of the necessity of informatization education	0.178	0.203	1.989*
understanding and utilization of informatization concepts	0.164	0.182	1.663

recognition of informatization risks	-0.024	-0.023	-0.270
F		8.637***	
R ²		.119	

*p<0.05, **p<0.01

The analysis of the effect of informatization mind on learning achievement shows that recognition of the necessity of informatization education ($\beta=0.190$, $p<0.05$), understanding and utilization of informatization concepts ($\beta=0.264$, $p<0.05$) among the sub-factors of informatization mind have a significant effect, as shown in Table 5. It explains 11.9% of the factors in the on major learning achievement.

Table 5. Effect of informatization mind on major learning achievement

Factors	b	β	t
	1.161		3.315*
recognition of the necessity of informatization education	0.218	0.190	1.994*
understanding and utilization of informatization concepts	0.314	0.264	2.591*
recognition of informatization risks	0.131	0.095	1.185
F		20.236***	
R ²		0.239	

*p<0.05, **p<0.01, ***p<0.001

The analysis of the effect of informatization mind on study problem resolution shows that recognition of the necessity of informatization education ($\beta=0.284$, $p<0.01$), understanding and utilization of informatization concepts ($\beta=0.280$, $p<0.01$), recognition of informatization risks ($\beta=0.180$, $p<0.05$) among the sub-factors of informatization mind have a significant effect, as shown in Table 6. It explains 11.9% of the factors in the on study problem resolution.

Table 6. Effect of informatization mind on study problem resolution

Factors	b	β	t
	0.753		2.612*
recognition of the necessity of informatization education	0.284	0.275	3.149**
understanding and utilization of informatization concepts	0.280	0.262	2.806**
recognition of informatization risks	0.180	0.145	1.985*
F		36.414***	
R ²		0.361	

*p<0.05, **p<0.01, ***p<0.001

As shown in Table 7, the analysis of the effects of information development efforts ($\beta=0.323$, $p<0.01$) on major learning achievement shows that the factors have a statistically positive effect, and 6% of the variations in major learning achievement are explained.

Table 7. Effect of information development efforts on major learning achievement

Factors	b	β	t
	2.667		10.550 ^{***}
information development efforts	0.323	0.611	3.506 ^{**}
F		12.291 ^{***}	
R ²		0.060	

** $p<0.01$, *** $p<0.001$

As shown in Table 8, the analysis of the effects of information development efforts ($\beta=0.323$, $p<0.01$) on study problem resolution shows that the factors have a statistically positive effect, and 6% of the variations in study problem resolution are explained.

Table 8. Effect of information development efforts on study problem resolution

Factors	b	β	t
	2.222		10.224 ^{***}
information development efforts	0.045	0.379	5.696 ^{***}
F		32.449 ^{***}	
R ²		0.143	

*** $p<0.001$

4. Conclusion

Through this study, it was shown that the higher the information mind of university students major in sports, the more information development efforts and academic achievement they have. In order to increase university students' efforts to develop information, it means that education is necessary to recognize the need for informatization education, improve understanding of informatization concepts, and make use of them. Therefore, if university students majoring in physical education develop an information mind education program that needs to be cultivated in general, they will be able to improve their information minds and achieve positive results of students' efforts to develop information on their own.

Based on the results of this study, I would like to present a conclusion by dividing it into academic and educational fields. The conclusions on the educational scene are as follows. Informatization minds play an important role in improving college students' academic performance. In other words, efforts should be made to help students recognize their information minds high in order to improve academic achievement, which is the ultimate goal of college students. This information mindset will always be focused on educational materials

to meet and cope with the new and rapidly changing era of the Fourth Industrial Revolution, not short-term education. It is necessary to develop and secure various educational materials on the need for informatization education, understanding and utilization of informatization concepts, and informatization risks so that education suitable for university students major in sports can be conducted.

The results of this study show that the information mind of college students is an important factor in their studies. Therefore, it is necessary to identify various factors that affect college students' studies through various studies related to these informatization mind. And in this study, there are some limitations in generalizing all students of major in sports in one university. Therefore, research on students of major in sports from various universities needs to be conducted.

References

- [1] C. W. Nam, and S. Y. Shin, "The Effects of Students' ICT-related Variables on Their Attitude toward ICT Use and Problem-solving Abilities", *Journal of Educational Evaluation*, Vol. 27, No. 5, pp. 1265-1286, Dec 2014.
- [2] C. W. Nam, and M. H. Lee, "The Effects of Smart Class Environmental Variables on College Students' Multimedia Utilization Attitude and Cooperative Learning Attitude in Higher Education", *Journal of Learner-Centered Curriculum and Instruction*, Vol. 20, No. 12, pp. 111-131, Jun 2020.
DOI: <http://dx.doi.org/10.22251/jlcci.2020.20.12.111>
- [3] E. C. Hwang, "Fourth industrial revolution of Women's University Students and change of intelligent information technology", *Journal of The Korea Society of Computer and Information*, vol. 24, No. 11, pp. 235-243 Nov 2019.
DOI: <https://doi.org/10.9708/jksci.2019.24.11.235>
- [4] SW Education in University, *Seoul Economy*, 2019.10.22.
- [5] K. Lim, H. J. Kim, and H. N. Park, "The Effects of learner participation and interaction in web-based collaborative learning", *The Journal of Korean association of computer education*, Vol.17, No.4, pp. 69-78, Jul 2014.
- [6] K. Chang, "Study on Open Group Project for the University Class", *Journal of Learner-Centered Curriculum and Instruction*, Vol. 15, No. 4, pp. 255-284, Apr 2015.
- [7] E. Kang, "The Fourth Industrial Revolution and the Future of University Education:", *Journal of Educational Innovation Research*, Vol. 29, No. 1, pp. 279-297, Mar 2019.
DOI: <http://dx.doi.org/10.21024/pnuedi.29.1.201903.279>
- [8] Aju Business Daily. Government announces '6th National Informatization Framework' for Intelligence Society. <https://www.ajunews.com/view/20181230104023414>
- [9] J. C. Nunnally and I. H. Bernstein, *Psychometric theory*, McGraw-Hill. 1994.
- [10] J. C. Anderson and D. W. Gerbing "Structural equation modeling in practice: A review and recommended two-step approach", *Psychological Bulletin*, Vol. 103, No. 3, pp. 411-423, May 1988.
DOI: <https://doi.org/10.1037/0033-2909.103.3.411>
- [11] G. D. Challagalla, and T. A. Shervani, "Dimensions and types of supervisory control: Effects on salesperson performance and satisfaction", *Journal of Marketing*, Vol. 60, No. 1, pp. 89-105, Jan 1996.
DOI: <https://doi.org/10.1177/002224299606000108>