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Research paper



Barriers on Using Social Media As Learning Tools Among Korean Pre-service Social Studies Teachers

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Abstract

This study aims to identify underlying types of deterrents on using social media as learning tools among Korean pre-service social studies teachers and to analyze whether gender and age are predictive of membership in types of deterrents. In order to achieve this goal, this research was conducted at Daegu University, Korea. For the purpose of this study, 207 social studies pre-service teachers were selected as sample, and responses were analyzed using latent class analysis (LCA) and multinominal logistic regression. We conducted analysis using PROC LCA for SAS environment. Study results are as follows. 1) the respondents were grouped into five latent classes: the technical barriers(12%), the situational and dispositional barriers(48%), the severe barriers(11%), the institutional barriers(23%), and the semi-economical barriers(6%). 2) Both gender ($p<.001$) and age($p<.001$) were predictors of latent class membership.

Keywords: *Technical barriers; Situational and dispositional barriers; Institutional barriers*

1. Introduction

The use of the social media by university students is growing at a substantial rate, and it's no wonder that university students spend most of their free time on social media websites. The growth of social media use has made it possible to increase interest in e-learning, recently many researchers, and engineers have recommend to the use of social media for educational purposes. Significants research relating to social media as an educational tool has focused on usefulness and use motivation[1, 2, 3, 4, 5].

These two approaches have offered relevant contributions to the field and a better understanding of the capacity of social media, but they lack explanation whether learners have difficulties in using social media as learning tools. Although little research has focused on enhancing our understanding of deterrents in using social media as learning tools among undergraduate students, some barriers of social media as learning tools have been identified[6,7,8,9,10].

However, issues related to the type of deterrents is an under-researched field[11], and researchers have paid little attention to issues related to the deterrents of pre-service teachers. Therefore, for this reason, our study aims to identify underlying the types of deterrents on using social media as learning tools among Korean pre-service social studies teachers, and to analyze whether gender and age are predictive of membership in types of deterrents.

Related to these aims, the following two research questions are considered: First, is it possible to classify Korean pre-service social studies teachers into underlying types according to their deterrents in using social media as learning tools? In other words, is there a latent class structure that adequately represents the heterogeneity in types of deterrents on using social media as learning tools among Korean pre-service social studies teachers? If so, what are the types and their corresponding prevalence? Second, are gender and age predictive of membership in these types of deterrents?

2. Materials and Methods

2.1 Sample Preparation

Data were collected utilizing Google-docs questionnaires submitted to secondary social studies pre-service teachers who enrolled in the pre-service teachers' program at Daegu University, Korea. Data were collected from December, 2016 to January, 2017. The survey was developed using Google drive and was shared among participants through email and KakaoTalk, which is a multi-platform texting application that allows iPhone, Android, and BlackBerry users to send and receive messages. Furthermore, it is very useful that this application is used by most smartphone owners in the Korea. Some participants' datasets were removed due to incompleteness or errors. The total sample consisted of 207 participants(48.1% male, 51.9 female).

2.2 Method of Research

The research instruments used in this study was a questionnaire. The questionnaire was employed to investigate the deterrents of social media as learning tool among the pre-service teachers. These respondents were asked open-questions to write deterrents of using social media as a learning tool, allowing as many answers as they considered appropriate. Subsequently the answers were analyzed and grouped in independent categories which grouped

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meanings closest to the original wording from the responses. Once the classification of all responses was completed, we proceeded to analyze the deterrents, and the columns on each table represented each deterrent. We assigned 1 if the category was mentioned by the respondent, and 2 otherwise.

These tables were thus comprised of binary variables. When categorical data are used, the latent class model has the advantage of making no assumptions about the distributions of the indicators other than that of local independence[11]. For this reason, we perform latent class analysis(LCA).

To perform the latent class analysis, we used PROC LCA, which is a latent class analysis program developed for the SAS environment. PROC LCA offers goodness-of-fit parameters such as the likelihood ratio chi-square(G^2) as well as parsimony statistics including the AIC (Akaike information criterion) and ABIC (Adjusted Bayesian information criterion), which help determine the best underlying model.

The distribution of the likelihood ratio statistic comparing two models should not be compared to a chi-square, and the difference G^2statistic can be used only in a rough way to compare model fit. The AIC and ABIC are penalized loglikelihood model information criteria that can be used to compare competing models fit to the same data. A smaller AIC and BIC for a particular model suggests that the trade-off between fit and parsimony is preferable[12].

Since the number of latent classes was unknown, the analysis was repeated for a number of classes starting in 2, until the best values for G^2, AIC, ABIC, and Entropy were determined.

The model with the smaller AIC value and smaller ABIC value considered better. The higher the entropy the more the information content. Entropy with values approaching 1 indicate clear delineation of classes, entropy values over 0.8 indicate a good separate of the latent classes [13].

With technical value, to interpretate model, each class should be distinguishable from the others on the basis of the item-response probabilities, and it should be possible to assign a meaningful label to each class and no class should be trivial in size[14].

Multiple regression analysis was performed to assess whether the differences between the variables such as gender and age for each class were statistically significant.

3. Results and Discussion

3.1 Types of Deterrents on Using Social Media

To determine the number of classes, we calculate the p-value for each model under the assumption that the G^2statistic follows a chi-square distribution and selected the most parsimonious model that provides an adequate fit (p>.01). Using this criteria, as Table 1 shows, the drop in G^2relative to the drop in degrees of freedom is substantial with each additional class up to the five-class model. However the addition of classes beyond five provides essentially no improvement in fit. Based on the G^2statistic, the best model is given by the five-class model(p value: 0.04). Also, according to the AIC and ABIC, the model with the lowest values is the five-class model(AIC:320.96, ABIC:328.77) as shown in Table 1.

The AIC and ABIC values agree with the G^2statistic, indicating that the five-class model is the best fit model. Also, entropy values exceed 0.9, which indicates good separation of the latent classes. In addition to the technical analysis, the five-class model is distinguishable and nontrivial, and meaningful labels can be assigned to each in Table 2.

Each column in Table 2 shows the probability of membership as well as the item-response probabilities for each class. Table 2 display the table of item-response probabilities, which indicate the likelihood that respondents in a given class reported the presence of the respective barrier in using social media as educational tool.

Once the number of classes was selected, we analyzed the probability of a response to each barrier item in the inventory for each latent class, based on Cross's conceptual framework of barriers,

Cross classified obstacles that deter adults from participation in organized learning activities from her review on studies which assessed the needs and interests of adult students[15].

Barriers were categorized as being situational, institutional, or dispositional[16]. Cross defined situational barriers as those arising from one's situation in life at a given time. In other words situational barriers are linked to the current life circumstances such as the lack of money. The most frequently identified situational barriers are cost of education and lack of time.
Institutional barriers were defined as all those practices and procedures of institutions that exclude or discourage from participating in educational activities. Institutional barriers are associated with factors such as regulations or system. The most frequently identified institutional barriers included the amount of time required to complete the program and lack of courses.
She defined dispositional barriers as those related to attitudes and self perceptions about oneself as a learner. Dispositional barriers are negative attitudes toward a specific item. The most frequently identified dispositional barriers included low grades in the past, lack of confidence in their ability to learn, and being unable to enjoy studying. Therefore dispositional barriers related to psychosocial barriers. We applied the three categories in order to group barriers to using social media as learning tools among Korean preservice social studies teachers. We assigned the following labels to the groups:

The Technical barriers class: The distinctive characteristic of this class is the lack of technical factors and money, and include lack of privacy, lack of security, and the cost burden associated with utilizing social media. 12% of respondents belong to this class

The Situational and dispositional barriers class: This class consists of respondents with very low social media literacy and have negative attitude toward social media. However respondents are not concerned about security and privacy. 48% belong to this class :

The Severe barriers class: This class consists of respondents with situational, institutional, and dispositional barriers. 11% were in this class.

The institutional barriers class: People belonging to this class emphasized barriers related to institution such as security, privacy, legal bases, and cyber bullying. 23% belong to this class.

The Semi-economical barriers class: Half of respondents belonging to this class are likely to perceive costs as a primary deterrent. 6% belong to this class.

Table 1L. Comparison of baseline models

Number of Latent Class	G^2	AIC	ABIC	Entropy	DF
2	377.55	415.55	377.55	0.91	492
3	314.36	372.36	376.99	0.93	482
4	259.62	337.62	343.84	0.95	472
5	222.96	320.96	328.77	0.94	462
6	203.30	321.30	330.71	0.93	452
7	182.96	320.96	331.96	0.94	442

Table 2:. Item-Response Probabilities for Five-Class Model : Probability of endorsing item given latent class

Item	Technical Barriers (12%)	Situational/ Dispositional Barriers (48%)	Severe Barriers (11%)	Institutional Barriers (23%)	Semi Economical Barriers (6%)
Too much cost	0.62	0.96	0.78	0.14	0.58
Lack of using application	0.00	0.74	1.00	0.42	0.04
Lack of data finding skill	0.33	0.91	1.00	0.00	0.00
Lack of inter-action skill	0.00	0.64	0.84	0.61	0.04
Lack of secu-rity	0.76	0.09	0.76	1.00	0.00
Lack of pri-vacy	0.95	0.05	0.95	0.96	0.10
Lack of legal bases	0.72	0.33	0.72	0.98	0.00
Cyber bully-ing	0.48	0.09	0.73	1.00	0.00
Valuelessness	0.50	0.70	0.74	0.39	0.17

3.2 Effect of Gender and Age

Gender and age were added as covariates in order to analyze whether gender and age are predictive of membership in the types of deterrents. The semi-economical barriers class was employed as the reference class in multinomial logistic regression. Table 3 shows the βparameters for the effects of each covariate, as well as the odds ratios(exponentiated βparameters).

Both gender($p<.001$) and age($p<.001$) were predictors of latent class membership. With respect to gender(a dummy variable, female: 1), females were twice more likely to be in the institutional barriers than the non barriers, six times as likely to be in the severe barriers class than the non barriers, and approximately eight times as likely to be in the technical barriers class than the non barriers.

The most striking finding is that females were near thirty times more likely to belong in the situational and dispositional barriers class than the non barrier class. For age(a standardized variable), respondents were twice as likely to be in the situational and dispositional barriers class than the non barrier class, 13% more likely to be in the severe class than the non barrier class. Also, the strongest effects of age are evident for situational and dispositional barriers.

Table 3.: Parameter Estimates and Odds Ratios for Covariates

	Situational and Dispositional Barriers		Institutional Barriers		Severe Barriers		Technical Barriers	
	Beta	OR	Beta	OR	Beta	OR	Beta	OR
Intercept	-0.45	0.64	0.92	2.52	-0.79	0.45	0.25	1.28
Gen-der***	3.38	29.50	0.79	2.20	1.90	6.66	2.03	7.58
Age***	1.05	2.85	-0.23	0.80	0.12	1.13	0.72	2.06

OR: odds ratios *** p<.001

4. Conclusion

It is necessary to enhance understanding of barriers that impede the use of social media as an educational tool for pre-service teachers. Using social media as an educational tool should not be restricted by restraining conditions that make it more difficult (eg. too much cost, lack of literacy, lack of privacy). As pre-service teachers' perception towards using social media as an educational tool can affect instructional design in secondary schools directly, perception towards using social media among pre-service teachers may reduce the potential of social media as a teaching tool. To maximize the potential of social media as a learning tool, it is important to realize these barriers to learning so that we find ways to remove these barriers.

Since research is limited regarding deterrents of social media use as an educational tool among pre-service teachers, this research provides valuable information concerning the barriers type. The findings of this study could contribute make a further insight into the field of secondary social studies teacher education curriculum, by identifying the barriers which could deter them from using social media as an educational tool. The main findings of our study offer one predominant type of barrier to secondary social studies pre-service teachers, which are mainly concerned about lack of legal bases and security issue.

We also observed a group whose members are not good at data finding skill yet, which suggests the need to foster educational technology in social studies teacher education curriculum. Although this research make a significant contribution to the literature, this study is of course not exempt from limitations. First of all the external validity of this study is quite limited so that the results cannot be generalized to all of social studies pre-service teachers. Additional research could be undertaken to better understand the deterrence construct. Future studies may combine fuzzy-set method with regression-based techniques to gain a deeper insight on the data and explore the effects of variables on the types

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