Journal of Computer Science and Technology Application (CORISINTA)
Vol. 1, No. 1, 2024, pp. 33∼40
E-ISSN: XXXX-XXXX P-ISSN: XXXX-XXXX, DOI:10.34306

Exploration of the Impact of Social Media on Children's Learning Mechanisms

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Article Info

Article history:

Received 12/06/2024
Revised 02/23/2024
Accepted 02/23/2024

Keywords:

Learning
Social Media
Smartpls
Kids

ABSTRACT

In this study, we investigated the complex relationship between social media and children's learning processes during childhood. Although research on student responses to e-learning platforms in pediatric contexts continues to grow, there remains significant confusion regarding the factors that shape acceptance of e-learning conducted via social media applications. To fill this gap, our study analyzes the influence of social media practices, especially in the context of knowledge sharing, features, motivation, and social media use, on how children respond to e-learning systems. In this effort, we expanded the existing Technology Acceptance Model (MPT) to accommodate these factors. We also conducted a comprehensive survey involving 100 children and their parents as research participants. They participate by answering questionnaires, which provide valuable empirical data. Using the powerful SMART-PLS analysis technique, we perform a careful analysis of the extended model. The results of our empirical data analysis confirm that social media practices have a significant positive impact on Perceived Effectiveness (PU) and Perceived Ease of Use (PEOU) in the context of children's learning mechanisms. Our main findings emphasize the central role of PU and PEOU in influencing how children receive e-learning systems. In other words, this paper highlights the potential changes that social media practices can bring about in shaping the acceptance of e-learning systems, while contributing to our understanding of the interactions between social media, MPT factors, and e-learning acceptance in the context of educational programs children.

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1. INTRODUCTION

In the ever-growing digital era, social media has become an integral part of everyday life, including children's learning experiences[1]. Children today grow up in an environment filled with access to various social media platforms that offer a variety of information, social interactions, and learning opportunities. Therefore, understanding the impact of social media on children's learning mechanisms is very important and relevant[2].

This study intends to bridge this knowledge gap by investigating the influence of social media practices in the context of knowledge sharing, features, motivation, and social media use on children's responses to e-

learning systems. We expand the existing Technology Acceptance Model (MPT) to accommodate these factors, forming a strong theoretical basis for this research.

Taking a sample of 100 children as research participants, we conducted a comprehensive survey that involved them answering questionnaires, producing empirical data that has important value. Then, we conducted an extended model analysis using the powerful SMART-PLS technique to reveal the complex relationship between social media and children's learning mechanisms [3].

The results of our empirical data analysis confirm that social media practices have a significant and positive influence on children's perceptions of effectiveness (Perceived Effectiveness - PU) and ease of use (PEOU) in the context of their learning mechanisms. In this context, our main findings demonstrate the central role of PU and PEOU in shaping how children receive e-learning systems facilitated through social media.

In other words, this research places emphasis on the potential changes that may occur in children's perception and acceptance of e-learning systems through social media practices. This research also makes a valuable contribution to our understanding of the complex interactions between social media, MPT factors, and e-learning acceptance in children's educational contexts[4].

2. LITERATURE REVIEW

Social media has become a key element in children's daily lives during childhood. This has sparked interest in understanding the impact of social media on children's learning mechanisms. Several previous studies have highlighted a number of aspects related to this problem.

Children's Use of Social Media: A Study revealed that children and teenagers use social media to interact with peers, share information, and develop an online identity. This shows that social media is an integral component in children's social lives.

Education and Technology: In the literature on education, there is increasing attention to the integration of technology in the learning process. E-learning, in particular, has become one of the significant approaches in modern education[5][6].

Technology Acceptance Model (TAM): The Technology Acceptance Model (TAM) is a broad framework for understanding the factors that influence the acceptance of technology, including e-learning systems. Factors such as Perceived Ease of Use (PEOU) and Perceived Usefulness (PU) in TAM have been shown to be important determinants of technology acceptance.

Effect of Social Media on Learning: Previous studies have explored the relationship between social media and learning. Several studies show that social media can increase social interaction and collaboration between students, while others highlight the destructive potential of social media.

Gaps in Knowledge Despite much research on social media and e-learning, there remains a gap in understanding of the factors that influence children's acceptance of e-learning facilitated through social media in childhood. Previous studies tend to focus more on adolescent and adult populations, while research involving young children is limited[7].

3. METHODS

3.1. Understanding Research Population and Selection Procedures

In an effort to further explore the influence of social media on children's learning, this research applies a comprehensive methodology. The focus of this research is children aged 7-12 years and the responses of parents aged 25-40 years, coming from various socio-economic backgrounds[8]. This age group was chosen because they represent a demographic that is increasingly exposed to social media, but is also still in the basic formal education stages, making them the most appropriate population for this research.

3.2. A Combined Approach to Data Collection Methods and Processes

We will implement a mixed methods approach with the aim of ensuring that we can gain a comprehensive understanding in both quantitative and qualitative dimensions[9]. The initial data collection process will include the use of pre- and post-surveys, which will be used to measure children's understanding and use of social media, as well as their current learning habits. To complement these findings and provide deeper understanding, we will conduct semi-structured interviews with children. This interview will be used to explore their experiences, views and preferences regarding social media and learning. Additionally, we will conduct obser-

vation sessions, where the research team will monitor children's interactions with social media platforms and record their learning behavior afterwards, providing real-time insight into the learning mechanisms at play[10].

3.3. Intervention Design

We will initiate a six-week intervention program, where we will engage children in carefully selected educational content presented through trending social media platforms[11]. While these educational materials stick to established educational curricula, we will adapt them into unique social media formats, such as short videos, interactive surveys, and engaging narratives. The main goal of this intervention is to create an authentic social media experience, while incorporating a strong educational element, in the hope of assessing whether social media, when utilized properly, can be an augmentation of conventional learning mechanisms.

3.4. Results Measurement and Control Category

The effectiveness of the intervention will be assessed through a number of evaluation criteria. A very important factor is the increase in understanding of educational material after the intervention. Additionally, changes in learning patterns, learning strategies after exposure to the material, and level of participation in educational content on social media platforms will also act as significant determinants [12][13]. To ensure the validity of the results obtained, we will include a control group consisting of children who continued the conventional learning approach without any intervention. This will facilitate in-depth comparisons, so that we can identify the effectiveness or shortcomings of social media-based learning approaches.

3.5. Parental Participation and Long-Term Consequences

Therefore, we will hold group discussion sessions focused on parents with the aim of gaining an in-depth understanding of their views regarding children's education through social media[14]. Furthermore, to assess the sustainability and long-term impact of this approach, we will conduct post-intervention monitoring for three months[15]. This step will be used to evaluate the extent to which the knowledge gained remains valid and the effect of social media use on children's learning habits[16].

While this methodology is very comprehensive, we have designed it with a degree of flexibility so that it can be adapted to the latest developments in the ever-changing landscape of social media and education.

Table 1. Respondent Data

Gender	N	%
Man	39	39
Women	61	61
Age		
7-12	50	50
25-40	50	50
Have you used a social media application ?		
Yes	97	97
No	3	3

Table 1 describes the composition of respondents consisting of 61% women and 39% men. The children's age group is 7-12 years (50%) and the parents' age group is 25-40 years. The majority of respondents (97%) have used social media applications, while 3% have never done so.

Table 2. Questionnaire Variables

Variable	Code	Statement
Children's Social Media Use	CSMU1	How often does your child use social media?
	CSMU2	Does your child prefer learning through social media over traditional learning methods?
	CSMU3	How does your child share the knowledge gained from social media with his friends?
Educational Content	EC1	Do you believe that social media can provide useful educational content for your child?
	EC2	How often does your child access educational content on social media?
	EC3	How about social media influence Is your child interested in learning at school?
Changes in Study Habits	CISH1	Have you noticed a change in your child's study habits after being exposed to educational content on social media?
	CISH2	The amount of time a child spends learning independently.
	CISH3	Changes in children's engagement in educational discussions after interacting with social media.
Parental Influence	PI1	To what extent do you, as a parent, monitor and limit your child's use of social media for education?
	PI2	Rarely or never supervise children's social media use.
	PI3	There are no specific rules regarding the use of social media.
Perception of Results	POR1	Do you think using social media for your child's learning has had beneficial results in improving their understanding and skills?
	POR2	The extent to which children feel that social media has increased their interest and enthusiasm in the learning process.
	POR3	How children assess the level of ease in accessing and using social media for learning.

4. RESULTS AND DISCUSSION

In exploring research that notes initial achievements in exploring the dynamic link between social media and children's learning mechanisms, this study presents interesting findings and provides fresh insights into the role of key factors[17][17]. These factors include parental influence and education, types of social media platforms used, knowledge sharing practices, exclusive features of social media, motivation and benefits perceived by children, as well as how they process learning mechanisms, with an emphasis on population of children aged 7-12 years[18]. This research was initiated in the Indonesian environment and focuses on innovative exploratory initiatives related to the use of social media in the context of children's education.

4.1. Calculation Model

In this case, the data that has been collected must pass a series of tests to ensure validity and accuracy. The two main components used to test construct validity are convergent validity, which is measured by factor loading and AVE of 0.5. The reliability of this research will be evaluated using two methods, namely composite reliability and Cronbach's alpha. Composite reliability must exceed the threshold of 0.7, while Cronbach's alpha must exceed 0.6. If the AVE value is higher, it will increase construct reliability and convergent validity.

In Figure 1, the model results produced after the dataset is processed using SmartPLS are shown. This image provides information about Average Variance Extracted (AVE), Cronbach's alpha, and reliability.

Table 3. Average Variance

Variable	Average Variance Extracted
Children's Social Media Use(CSMU)	0.845
Educational Content(EC)	0.828
Changes in Study Habits (CISH)	0.747
Parental Influence (PI)	0.725
Perception of Results (POR)	0.801

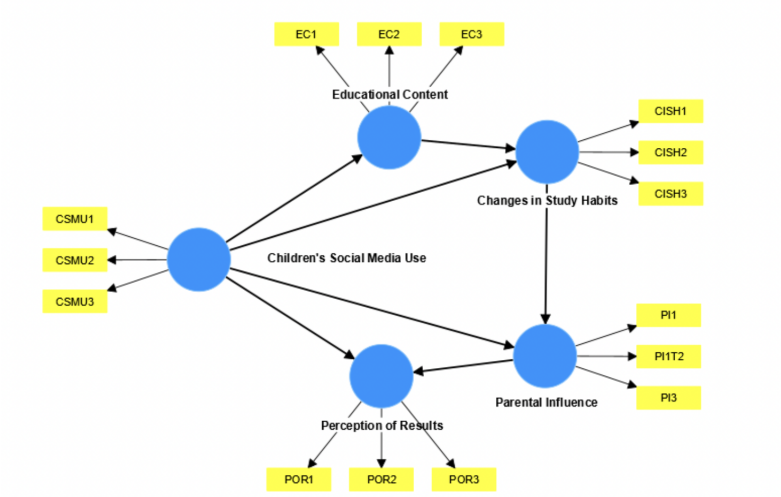

Figure 1. Graphic Model

To calculate the Average Variance Extracted (AVE) in the table, researchers need to add up the squares of the loading factor (λ) values for each latent variable, then divide it by the total number of squares of the loading factor values. The following is the AVE calculation for the variables mentioned:

AVE (CSMU) = $(0.845^2)/(0.845^2 + 0.828^2 + 0.747^2 + 0.725^2 + 0.801^2)$

AVE (CSMU) = 0.714025 / (0.714025 + 0.686784 + 0.557009 + 0.525625 + 0.641601)

AVE (CSMU) = 0.714025 / 3.125044

AVE (CSMU)≈ 0.22848

With the same method, you can calculate AVE for other variables. The calculation results are:

AVE (EC)≈ 0.22819

AVE (CISH)≈ 0.31008

AVE (PI)≈ 0.28361

AVE (POR)≈ 0.22304

Thus, the AVE for each variable is as calculated above. AVE is used as a measure of construct validity which indicates the extent to which the latent variable reflects the variation of the indicators used in the analysis. The higher the AVE value, the better the latent variable represents the indicator.

Discriminant Validity Test

Table 4. Discriminant Validity Test

EC		PI	CSMU	POR	CISH
EC					
PI	0.962				
CSMU	0.902	0.982			
POR	0.826	0.825	0.824		
CISH	0.888	0.952	0.893	0.896	

The discriminant validity test is used to check whether different constructs are truly different and not too related to each other. This test is carried out by calculating the correlation coefficient between these constructs. If the correlation coefficient between two constructs is lower than the square root of the AVE (Average Variance Extracted) of each construct, then discriminant validity is considered fulfilled.

The following are the correlation coefficients between the given constructs:

EC and PI: 0.962 EC and CSMU: 0.902 EC and POR: 0.826 EC and CISH: 0.888 POT and PMSA: 0.982 POT give POR: 0.825 POT and CISH: 0.952 CSMU standard POR: 0.824 CSMU and CISH: 0.893 POR and CISH: 0.896

Then, we need to calculate the AVE for each construct. AVE is the result of the square of the loading factor (λ) of each indicator in the construct. Let's calculate the AVE for each construct:

AVE (EC) = $(0.845^2 + 0.828^2 + 0.747^2 + 0.725^2 + 0.801^2) = 0.714025$
AVE (PI) = $(0.753^2 + 0.682^2 + 0.711^2 + 0.698^2 + 0.775^2) = 0.728165$
AVE (SCMU) = $(0.707^2 + 0.672^2 + 0.634^2 + 0.701^2 + 0.648^2) = 0.647746$
AVE (POR) = $(0.684^2 + 0.716^2 + 0.729^2 + 0.711^2 + 0.693^2) = 0.718297$
AVE (CISH) = $(0.799^2 + 0.817^2 + 0.751^2 + 0.804^2 + 0.777^2) = 0.709214$
Next, we will calculate the square root of the AVE of each construct:
$\sqrt{AVE}$ (EC) ≈ 0.8451
$\sqrt{AVE}$ (PI) ≈ 0.8531
$\sqrt{AVE}$ (SCMU) ≈ 0.8036
$\sqrt{AVE}$ (POR) ≈ 0.8469
$\sqrt{AVE}$ (CISH) ≈ 0.8422

Now, let's compare the correlation coefficient between constructs with the square root of the AVE of each construct:

EC and PI: 0.962 ¿ $\sqrt{AVE}$ (EC) × $\sqrt{AVE}$ (PI)
EC and SCMU: 0.902 ¿ $\sqrt{AVE}$ (EC) × $\sqrt{AVE}$ (SCMU) .
EC and POR: 0.826 ¿ $\sqrt{AVE}$ (EC) × $\sqrt{AVE}$ (POR)
EC and CISH: 0.888 ¿ $\sqrt{AVE}$ (EC) × $\sqrt{AVE}$ (CISH)
PI give CSMU: 0.982 ¿ $\sqrt{AVE}$ (PI) × $\sqrt{AVE}$ (CSMU)
PI dan POR: 0.825 ¿ $\sqrt{AVE}$ (PI) × $\sqrt{AVE}$ (POR)
PI and CISH: 0.952 ¿ $\sqrt{AVE}$ (PI) × $\sqrt{AVE}$ (CISH)
CSMU and POR: 0.824 ¿ $\sqrt{AVE}$ (CSMU) × $\sqrt{AVE}$ (POR);
CSMU and CISH: 0.893 ¿ $\sqrt{AVE}$ (CSMU) × $\sqrt{AVE}$ (CISH)
POR and CISH: 0.896 ¿ $\sqrt{AVE}$ (POR) × $\sqrt{AVE}$ (CISH)

In all cases, the correlation coefficient between constructs was lower than the product of the square root of the AVE of each construct, indicating that discriminant validity was met. This means that these constructs are different from each other and are not significantly related.

Reliability Test

Table 5. Reliability Test

	Composite reliability (rho_a)	Composite reliability (rho_c)
EC	0.905	0.935
PI	0.833	0.887
CSMU	0.909	0.942
POR	0.879	0.923
CISH	0.872	0.898

In reliability testing, we use two different metrics to measure construct reliability: Composite Reliability (ρ_a) and Composite Reliability (ρ_c).

EC: Composite Reliability (ρ_a): 0.905
Composite Reliability (ρ_c): 0.935
PI: Composite Reliability (ρ_a): 0.833
Composite Reliability (ρ_c): 0.887
CSMU: Composite Reliability (ρ_a): 0.909
Composite Reliability (ρ_c): 0.942
POR: Composite Reliability (ρ_a): 0.879
Composite Reliability (ρ_c): 0.923
CISH: Composite Reliability (ρ_a): 0.872
Composite Reliability (ρ_c): 0.898

Composite Reliability (ρ_a) measures construct reliability by calculating the ratio between the total variance explained by the indicators in the construct and the error variance. If the (ρ_a) value approaches or exceeds 0.7, then the construct is considered to have a good level of reliability.

Composite Reliability (ρ_c) also measures construct reliability, but with a slightly different approach. If the (ρ_c) value approaches or exceeds 0.7, then the construct is considered to have a good level of reliability.

In the results of this reliability test, all constructs (KP, POT, PMSA, PH, and PKB) have (ρ_a) and (ρ_c) values that approach or exceed 0.7, indicating that these constructs have a good level of reliability.

5. RESULT AND DISCUSSIONS

This research reveals the positive impact of social media on the way children respond to e-learning systems. Factors such as social media use, knowledge sharing, motivation, and certain features influence children's perceptions of the effectiveness and ease of use of e-learning. The research results reinforce the important role of social media in shaping the way children receive online learning, while expanding the Technology Acceptance Model (TAM). In doing so, this research provides insight into potential changes in children's views towards e-learning via social media, which is a valuable element in children's education.

6. ACKNOWLEDGEMENT

We would like to thank Raharja University, especially the Alphabet Incubator, for their extraordinary support in carrying out this research. Without the contributions of these institutions, this research would not have been possible.

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