

Exploring Early Childhood Teachers' Willingness to Integrate Tabletop Games in Their Teaching: A Correlational Research Study in Kunming, Yunnan Province, China

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ABSTRACT

Early childhood education is vital for children's development, encompassing cognition, emotion, social skills, and language. Traditional methods mainly rely on classroom instruction, but tabletop games have gained increasing recognition for their potential in early education. These games encourage interaction, critical thinking, and cooperative communication, fostering rich learning experiences and holistic development. Drawing from the Theory of Planned Behavior, this study examines preschool teachers' current practice of integrating tabletop games into teaching and the factors influencing their intention to use such games. Key findings include significant differences in behavioral attitudes, subjective norms, perceived behavioral control, and intentions to integrate tabletop games based on variables like age, teaching experience, position, and subject matter. Teachers' attitudes, norms, and behavioral control significantly correlate with and positively predict their intentions to incorporate tabletop games. The study suggests that teachers' intentions to integrate games are higher when they perceive a greater availability of suitable games. Schools can, therefore, enhance teachers' willingness by providing appropriate games through procurement strategies.

Keywords: *Technology, Tabletop Games, Theory of Planned Behavior, and Preschool*

INTRODUCTION

Preschool education is an essential stage of children's development, which is crucial for children's cognitive, emotional, social, and language development (Zhang, 2022). Traditional preschool education is usually dominated by classroom teaching, but in recent years, more and more educators have begun to recognize the potential of tabletop games in preschool education (You, 2022). As a highly interactive teaching tool that inspires thinking and promotes cooperation and communication, tabletop games provide a rich learning experience and promote the development of children's comprehensive abilities (Du, Zhang, Ma, 2022). Students should observe, experience, and experiment by themselves, do it with their hands and think with their brains to cultivate their initiative spirit. Automatic attitude and automatic learning ability (Wang, 2010). When students take the initiative to learn, curiosity will make them want to find the answer to the question or the method of doing things.

The study aimed to explore the extent to which early childhood educators are willing to integrate tabletop games into their teaching practices. The study examines whether noteworthy disparities exist in teachers' inclinations towards incorporating tabletop games into their teaching methodologies based on varying factors such as gender, age, professional positions, years of experience, and teaching subjects. The findings from this research hold the potential to provide valuable reference points for educational institutions and authorities interested in integrating different tabletop games into their teaching approaches and promoting their effective use within educational settings. The research also aims to uncover how using tabletop games in the classroom can better support students' educational needs and prepare them for a dynamic and collaborative world.

The research questions are listed as follows:

1. How do different background variables influence teachers' attitudes, subjective norms,

and perceived behavioral control?

2. How do the teachers' behavioral attitudes, subjective norms, and perceived behavioral control affect their willingness to use tabletop games to integrate into teaching?

LITERATURE REVIEW

This chapter is mainly based on the theory of planned behavior, discusses the behavioral intention of teachers to integrate tabletop games into teaching, and discusses the influence of different backgrounds on behavioral intentions. The whole chapter is divided into three sections: the first section is the connotation and theoretical basis of tabletop games; The second section is related research on tabletop games integration into teaching; the third section is the meaning and related research of the theory of planned behavior.

Integration of Tabletop Games into Classroom Teaching

Yang (2014) conducted action research on integrating chart-and-card tabletop games into fifth-grade composition teaching in the preschool education stage. The research results help improve students' learning motivation, enhance students' learning interest, and interact with students and teaching content, teachers, and peers. Interactive. Li (2015) explored the effect of literacy tabletop games on the germination of literacy for children with insufficient stimulation in the preschool language environment. The study results showed that the knowledge of visual symbols in the experimental group has significantly improved, and tabletop games can improve the Chinese characters of participating children of different ages, language abilities, and regions. Class identification ability tabletop games can effectively improve the perception performance of indirect literacy for children with insufficient stimulation in the preschool language environment.

Tabletop Games and Preschool Education

Liu (2016) discussed the case study of the application of tabletop games in the learning of social skills of junior high school students with cerebral palsy. It showed that the learning of social skills courses was positive for students, the feeling of social skills courses was good, and the generalization of social skills courses had positive effects. To influence. Gao (2015) explored a case study on the influence of tabletop games on graphic literacy teaching on the literacy ability of students with mild intellectual disabilities. The object was a student with mild intellectual disabilities in the sixth grade of preschool education. Literacy skills, improving overall Mandarin learning performance, including learning motivation, assessment performance, reading ability, and course participation. Zhou (2018) conducted a study on the effect of tabletop games on the environmental education learning of preschool children in two fifth-grade classes in a preschool education stage in Yunlin County. High-quality teaching can improve knowledge and enhance learners' interest in learning.

Previous Studies on Integrating Tabletop Games in Classrooms

Huang (2018) used the talent classroom taught by five preschool students in the first and second grades and one kindergarten student to integrate tabletop games into picture book teaching to improve children's character. The research pointed out that integrating tabletop games into teaching can cause students to learn. Completed in fun and do-it-yourself, students gain a more concrete understanding of character. Wu's (2018) research topic is the study of renewable energy tabletop games on ninth-grade students' learning outcomes and decision-making processes. The research shows that the integration of tabletop games into renewable energy knowledge and concepts has a significant effect on improving learning outcomes. Fang (2018) experimented on the third grade of preschool education. The number of people in the experiment was 56. The test after the tabletop games teaching was analyzed, and the research results showed that the learning effect of procedural computing thinking improved significantly. Children like tabletop games. The learning method is exciting and liked. Students, teachers, and students give positive feedback through interaction with tabletop games, which can improve students' motivation and satisfaction.

THEORETICAL FRAMEWORK

This study employed the Theory of Planned Behavior (TPB). According to TRA theory, hypothetical behavior (Behavior) is influenced by behavioral intention (behavioral intention, BI), which shows that the most direct factor influencing individual behavior is individual behavioral intention (BI). From the interdependent relationship between attitude, intention, and behavior, TRA theory holds that behavioral intention is affected by factors such as attitude (Attitude) and subjective norm (Subjective norm, SN). TRA believed that when the individual's thoughts no longer control an individual's behavior, the individual's ability to perform a particular behavior is more easily disturbed. The individual's ability to perform the behavior, the stronger the control over the behavior, the higher the behavioral intention, even if the intention to perform a certain behavior is strong, but because the individual's ability cannot be executed, it is believed that the perceived behavioral control will also affect the behavior Intention (Ajzen & Madden, 1986).

RESEARCH METHOD

This quantitative study examined early childhood teachers' intentions to incorporate tabletop games into their teaching. Data were collected using an online questionnaire adapted from scales developed by Li (2012), Huang (2012), and Zhang and modified to suit the school environment. Questionnaires were chosen due to their efficiency and cost-effectiveness in gathering structured information (Wilkinson & Birmingham, 2003). In this study, a simple random sampling method was employed, and a standard formula from statistical theory (Daniel, 2012) determined the appropriate sample size. Considering a population size (N) of 9783 teachers (source: Kunming Education Bureau 2023 data), a margin of error (e) of 5%, and a 95% confidence level ($Z = 1.960$), the sample size (n) was calculated to be approximately 375.

The distribution tool "Questionnaire Star" targeted preschool teachers in Kunming City. Six hundred fifty questionnaires were distributed from March 1 to March 28, 2024, yielding 536 valid responses and an 83% effective recovery rate. Using a larger sample may improve the accuracy and reliability of the survey by reducing sampling error, bringing sample statistics closer to population parameters, and enhancing the precision of inferences (Lohr, 2019). In most cases, an increase in sample size narrows the confidence interval, approaching the population parameter (Cochran, 1977; Daniel, 2012).

Data was analyzed using SPSS 21.0 software. Gender, age, experience, job title, and teaching subjects were analyzed using descriptive statistics, including the arithmetic mean ($\bar{X}$), standard deviation (SD), and percentage. Inferential statistics for an independent sample t-test were used to establish differences in behavioral attitudes, subjective norms, and perceived control behavior between male and female teachers. One-way ANOVA (for age, job titles): experience and teaching subjects. We adopted Pearson Correlation Analysis to assess the strength of relationships among various research dimensions and test hypotheses. Similarly, stepwise regression analysis examines the effect of personal attitude, subjective norms, and perceived behavioral control on all outcomes and their association with behavior intention.

This section describes the research process, from the research background and purpose to collecting and arranging relevant literature and planning to establish the research structure and questionnaire topic design. After the actual questionnaire survey, statistical data analysis was implemented to obtain the research results, and finally, research conclusions and recommendations were put forward.

FINDINGS

This section presents the study's findings, starting with analyzing differences in teachers' behaviors and attitudes toward using tabletop games to integrate teaching with different background variables.

Analysis of differences in teachers' behaviors and attitudes toward using tabletop games to integrate teaching with different background variables

TABLE 1 Behavior and attitude subscale of teachers of different background t-test

	gender	number of people	average	standard deviation	t-value	p-value
behavioral beliefs	female	423	4.16	0.54	-.48	.63
	male	113	4.19	0.58		
result evaluation	female	423	4.27	0.57	3.55**	<.01
	male	113	4.02	0.72		
total scale	female	423	4.21	0.53	1.74	0.08
	male	113	4.10	0.62		
	age	number of people	average	standard deviation	F value	p-value
Behavioral beliefs	A	178	4.31	0.51	3.69**	<.01
	B	135	4.11	0.57		
	C	89	4.04	0.55		
	D.	86	4.35	0.54		
	E.	23	4.13	0.52		
	F	25	4.30	0.32		
Result evaluation	A	178	4.29	0.58	3.07	0.01
	B	135	4.13	0.71		
	C	89	4.05	0.59		
	D	86	4.38	0.72		
	E	23	4.23	0.38		
	F	25	4.50	0.11		
Total scale	A	178	4.30	0.53	3.68**	<.01
	B	135	4.12	0.61		
	C	89	4.05	0.52		
	D	86	4.36	0.59		
	E	23	4.18	0.44		
	F	25	4.40	0.21		
	number of years	number of people	average	standard deviation	F value	p-value
Behavioral beliefs	A	92	4.33	0.54	4.20*	<.01
	B	116	4.08	0.55		
	C	111	4.10	0.58		
	D	112	4.28	0.48		
	E	105	3.96	0.48		
Result evaluation	A	92	4.34	0.60	7.05*	<.01
	B	116	4.03	0.71		

	C	111	4.09	0.55		
	D	112	4.49	0.47		
	E	105	4.11	0.36		
	A	92	4.33	0.56		
	B	116	4.06	0.60		
Total scale	C	111	4.09	0.51	5.97*	<.01
	D	112	4.39	0.44		
	E	105	4.04	0.42		

	position	number of people	average	standard deviation	F value	p-value
	221	146	4.24	0.57		
behavioral beliefs	215	115	4.20	0.46	5.69**	<.01
	100	92	4.01	0.59		
	221	146	4.25	0.64		
result evaluation	215	115	4.27	0.50	6.39*	<.01
	100	92	3.99	0.74		
	221	146	4.25	0.58		
total scale	215	115	4.23	0.43	6.69*	<.01
	100	92	4.00	0.63		

In analyzing the significant differences between the above-mentioned background variables and the dimensions of behavior and attitude, in the dimension of outcome evaluation, the scores of female teachers are significantly higher than those of male teachers. Belief has no significant correlation, and the result is the same as Chen's (2018). It can be speculated that the willingness to implement tabletop games into teaching and the influencing factors will not be different because the teacher is male or female; in terms of age variables, the average values of behavioral beliefs, outcome evaluations, and total scales for those aged 41-45 years old were significantly higher than those of other age groups. In terms of age, among the average number of behavioral beliefs, the average number of years under 5 years (inclusive) is significantly higher than that of other age groups;

The dimensions of the result evaluation and the scores of the total scale, as well as the average number of years between 16 and 20 years (inclusive), are the highest. This result is the same as the research of Chen (2018), indicating that integrating tabletop games into teaching by new teachers can improve teaching Quality and strengthen students' learning motivation. They have higher beliefs and are more willing to integrate tabletop games into teaching. Regarding occupational scores, the average number of junior and middle-level teachers is significantly higher than that of senior teachers.

Regarding the total score of the subjects taught, the average score for life is the highest, followed by English and nature. This is likely because the life course is unique for the lower grades. Without too much learning pressure, the life course can Use tabletop games to integrate into relationships with more teaching opportunities.

Analysis of differences in teachers' behavioral intentions of using tabletop games to integrate teaching with different background variables

TABLE 2 Subjective norm subscale t-test for teachers of different background

	gender	number of people	average	standard deviation	t-value	p- value
Standard belief	female	423	4.23	0.57	4.56*	<.01
	male	113	3.92	0.67		
Obedience motive	female	423	3.82	0.70	2.78**	<.01
	male	113	3.61	0.63		
Total scale	female	423	4.00	0.54	4.46**	<.01
	male	113	3.75	0.48		

	age	number of people	average	standard deviation	F value	p- value
standard belief	A	178	4.08	0.60	6.02**	<.01
	B	135	4.15	0.64		
	C	89	3.94	0.61		
	D	86	4.46	0.61		
	E	23	4.14	0.52		
	F	25	4.38	0.13		
obedience motive	A	178	3.73	0.53	5.89**	<.01
	B	135	3.63	0.89		
	C	89	3.81	0.60		
	D	86	3.92	0.57		
	E	23	3.28	0.47		
	F	25	4.50	0.53		

	number of years	number of people	average	standard deviation	F value	p-value
standard belief	A	92	4.10	0.57	3.34*	0.01
	B	116	4.03	0.67		
	C	111	4.17	0.67		
	D	112	4.39	0.48		
	E	105	4.09	0.52		
obedience motivation	A	92	4.04	0.69	10.06**	<.01
	B	116	3.58	0.72		
	C	111	3.89	0.55		
	D	112	3.73	0.51		
	E	105	3.26	0.52		
Total surface	A	92	4.07	0.58	6.81**	<.01
	B	116	3.78	0.52		

	C	111	4.01	0.49
	D	112	4.02	0.44
	E	105	3.63	0.47

Table 3 Subjective norm subscale t-test for teachers of different number of years
Table 4 Significance Analysis of Subjective Norm Subscales of Teachers of Different Professions

	position	number of people	average	standard deviation	F value	p- value	afterward Comparison
standard belief	A	221	4.18	0.57	.97	.38	none
	B	215	4.07	0.57			
	C	100	4.10	0.57			
obedience motive	A	221	3.81	0.63	.84	.43	none
	B	215	3.71	0.71			
	C	100	3.71	0.72			
total scale	A	221	3.97	0.53	1.32	.27	none
	B	215	3.87	0.46			
	A	100	3.88	0.62			

Table 5 Significance Analysis of Teachers' Subjective Norm Subscale of Different Tabletop Games Integrating into Teaching Subjects

	subject	number of people	average	standard deviation	F value	p-value	hindsight comparison
standard belief	A	28	4.15	0.65	3.30*	<.01	none
	B	17	3.99	0.63			
	C	106	3.96	0.82			
	D	28	4.42	0.56			
	E	124	4.27	0.38			
	F	28	3.98	0.67			
	G	107	3.91	0.58			
	H	21	3.50	0.00			
	I	22	4.00	0.00			
	J	55	4.75	0.00			
obedience motive	A	28	3.74	0.53	7.98**	<.01	J>A
	B	17	3.71	0.77			J>B
	C	106	3.46	0.52			J>C
	D	28	4.08	0.59			J>G
	E	124	3.50	0.57			J>H
	F	28	3.93	0.57			
	G	107	3.22	1.10			

	H	21	3.00	0.00			
	I	22	4.20	0.00			
	J	55	5.00	0.00			
	A	28	3.92	0.49			J>A
	B	17	3.83	0.64			
	C	106	3.68	0.64			J>B
total scale	D	28	4.23	0.48	6.87	<.01	
	E	124	3.85	0.44			J>C
	F	28	3.95	0.48			
	G	107	3.53	0.50			J>G
	H	21	3.22	0.00			J>H
	I	22	4.11	0.00			
	J	55	4.89	0.00			

The analysis of the above-mentioned differences in subjective norms shows that the average scores of female teachers are significantly higher than those of male teachers in variables of different gender backgrounds, indicating that female teachers are relatively more willing to use tabletop games to integrate into teaching in response to the requirements of other related parties; Among the background variables, in terms of standard belief scores, the average age of 41-45 years old is the highest; in the score of obedience motivation, the average age of 51 years and above is the highest; in the total scale In terms of scores, the average score for those over 51 years old (inclusive) is the highest. It can be seen that the older the age, the higher the strength of subjective norms. The background variables of different ages, in terms of standard beliefs, the average age of 16 to 20 years (inclusive) was significantly higher than that of 6 to 10 years (inclusive); in obedience motivation, the average age of 11 to the average of 15 years (inclusive) is significantly higher than that of 6 to 10 years (inclusive) and more than 21 years (inclusive).

DISCUSSION

The Impact of Different Background Variables on Teachers ' Behavioral Attitudes, Subjective Norms, and Perceived Behavioral Control

(1) Do teachers significantly differ in their behavior and attitude toward using tabletop games to integrate teaching under different background variables?

① There are significant differences among the teachers in the subscale of behavioral beliefs regarding age, years of experience, job title, and teaching subjects.

② There are significant differences among teachers in terms of gender, age, years of experience, and job title on the subscale of outcome evaluation.

③ Significant differences exist in teachers' behavior and attitude regarding age, years of experience, job title, and teaching subjects.

(2) Do teachers significantly differ in the subjective norms of using tabletop games to integrate teaching in different background variables?

① On the standard belief subscale, teachers have significant differences in gender, age, and years of experience.

② There are significant differences among teachers in subscales of obedience motivation regarding gender, age, years of experience, and teaching subjects.

③ There are significant differences among teachers regarding gender, age, years of experience, and teaching subjects in the total scale of subjective norms.

(3) Do variables of teachers have significant differences in the perceived behavioral control of using tabletop games to integrate into teaching?

① There are significant differences among teachers regarding the control belief subscale regarding gender, years of experience, and job title.

② There are significant differences among teachers regarding convenience perception subscale, age, years of experience, and teaching subjects.

③ There are significant differences among teachers in the total scale of perceived behavioral control regarding age, years of experience, and teaching subjects.

④ Do different background variables of teachers have significant differences in the behavioral intention of using tabletop games to integrate into teaching?

⑤ The age of teachers has no significant difference in the behavioral intention of using tabletop games to integrate teaching. Teachers have significant differences in the total scale of behavioral intentions, gender, age, job title, and teaching subjects.

The Impact of Teachers ' Behavioral Attitudes, Subjective Norms, and Perceived Behavioral Control on Teacher's Willingness to Integrate Tabletop Games into Teaching

(1) The impact of behavioral control on behavioral intentions

① Teacher 's behavioral attitude has a positive predictive and explanatory power on behavioral intention

Using Pearson product difference correlation analysis, it was found that teachers' behavioral attitudes toward integrating tabletop games into teaching, including behavioral intentions and result evaluation dimensions, had a significant positive correlation with the behavioral intention variables of tabletop games into teaching. Through regression analysis, it is found that "behavioral attitude" has a positive predictive power for " behavioral intention". The behavioral intention of integrating tabletop games into teaching will also increase.

② Teachers ' subjective norms have a positive predictive and explanatory power on behavioral intentions

Teachers' subjective norms of tabletop games integration into teaching, including standard beliefs and obedience motivation dimensions, have a significant positive correlation with the behavioral intention variables of tabletop games integration into teaching. Through regression analysis, it is found that "subjective norms" have a positive predictive power for "behavioral intentions": that is to say, when teachers have stronger positive subjective norms for the integration of tabletop games into teaching, teachers are willing to try to integrate tabletop games into teaching. Behavioral intentions to incorporate teaching will also increase.

③ Teachers ' perceived behavioral control has a positive predictive and explanatory power on behavioral intentions

The teacher's perceived behavioral control of tabletop games integration into teaching, including control beliefs and convenience perception dimensions, has a significant positive correlation with the behavioral intention variables of tabletop games integration into teaching. Through regression analysis, it is found that "perceived behavioral control" has a positive predictive power for "behavioral intention": that is, when teachers integrate tabletop games into teaching, if they have sufficient ability to control the perception of resources and opportunities, Teachers' willingness to try to integrate tabletop games into teaching will also increase.

CONCLUSION

This study investigated the influence of background variables on teachers' attitudes, beliefs, norms, control perceptions, and behavioral intentions regarding integrating tabletop games into teaching. Several research hypotheses were verified through questionnaire surveys and statistical analysis, leading to the following key conclusions: Regarding behavioral attitudes, gender shows significant differences in outcome evaluation but not in overall behavioral beliefs and attitudes. Age, years of teaching experience, and job positions significantly affect behavioral beliefs, outcome evaluation, and attitudes. Different subject teachers show significant differences in behavioral beliefs and attitudes but not outcome evaluation.

Regarding subjective norms, gender, age, years of teaching experience, and teaching subjects significantly influence subjective norms, while job positions do not. In perceived behavioral control, gender shows significant differences in control beliefs and overall perceived behavioral control but not in convenience perception. Age shows significant differences in convenience perception but not in control beliefs or overall perceived behavioral control. Years of teaching experience significantly affect control beliefs, convenience perception, and overall perceived behavioral control. Job positions significantly influence control beliefs and perceived behavioral control, but not convenience perception. Teaching subjects significantly impact convenience perception and overall perceived behavioral control, but not control beliefs. For behavioral intentions gender, age, and job positions significantly affect behavioral intentions, while years of teaching experience do not. Teaching subjects significantly impacts behavioral intentions. Additionally, the study found that teachers' behavioral attitudes, subjective norms, and perceived behavioral control significantly predict their behavioral intentions to integrate tabletop games into teaching. Specifically, teachers' positive attitudes towards integrating tabletop games, subjective solid norms, and perceived control over resources and opportunities significantly enhance their behavioral intentions to integrate tabletop games into teaching.

In summary, this study confirms that background variables such as gender, age, years of teaching experience, job positions, and teaching subjects significantly influence teachers' attitudes, beliefs, norms, control perceptions, and behavioral intentions regarding integrating tabletop games into teaching. Moreover, teachers' attitudes, subjective norms, and perceived behavioral control significantly predict their behavioral intentions to integrate these games into teaching. These findings align with existing research, indicating that enhancing teachers' confidence, providing support, and sufficient teaching resources are crucial for promoting the adoption of innovative teaching methods.

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