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An Empirical Study of Parents' Participation Behavior in the Home-Based Online Learning of Primary School Students

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Abstract: Parental participation has an important and direct influence on the effect of home-based online learning of primary school students. Taking more than 500 guardians of primary school students in a number of prefecture-level cities in the Pearl River Delta as the questionnaire respondents, and applying the structural equation model method, this paper, based on the theory of planned behavior, explores the effects of various factors on parental participation in the home-based online learning of primary school students. The results show that: (1) the behavioral intention of parents to participate in the home-based online learning of primary school students has a significant influence on their actual participation behavior. (2) Behavioral attitudes, subjective norms, and perceived behavioral control have a significant influence on behavioral intention. To strengthen the actual effects of parents' participation behavior, this paper puts forward a number of suggestions. These include enhancing home-school partnerships, achieving home-school co-education, and training parents with regard to the integration of daily Internet use and online learning for primary school students. This study supports the effective implementation of home-based online learning of primary school students and the joint effect of home-school co-education, specifically from the perspective of parents in the subsequent implementation of integrated online and offline teaching.

Keywords: theory of planned behavior; parent participation; online learning; participating behavior; structural equation model

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1. Introduction

In the post-COVID-19 pandemic era, the application of information technology to education and teaching reform has gradually become normalized. Now, basic education has entered a new stage of the integration and coexistence of online and offline teaching [1]. However, online learning lacks communication and interaction, and thus online learners are prone to feeling lonely, leading to learning fatigue and a decline in participation intention [2]. Changing this situation requires support and participation from various parties, of which parents are key. Tutoring anxiety in explaining the relationship from parental perspectives plays a significant mediating role in the association between different social comparisons and perceived online academic futility [3]. The support of parents is known to provide a significant guarantee for the successful application of information technology in education [4].

Numerous studies have shown that parents' participation in school education is closely related to children's academic achievement and autonomic learning ability in both the cognitive and non-cognitive fields. Even the top schools cannot educate children well without positive support from children's families [5]. For example, the online learning ability of primary school students is positively influenced by parents' willingness [6]. Home-based participation has a larger influence on students' study habits than school-based participation [7]. Parental participation, as a multi-dimensional concept, is a key factor that influences students' academic achievements [8].

When learning online from home, primary and high school students need to make study plans, choose reasonable learning resources, and make use of their autonomous

learning ability. At the same time, their autonomous learning ability is still developing. Particularly for primary school students, their academic success cannot be guaranteed solely through independent access to the Internet or other tools [9]. The students' parents should realize the advantages of online learning, give full play to the value of online learning in education, and provide support in terms of their attitude, behavior, and other aspects, accompanied by the necessary supervision and encouragement, so as to achieve the best possible results.

The theory of planned behavior (TPB) [10] is based on applying individual behavioral attitudes, subjective norms, and perceived behavioral control to predict the behavioral intention and actual behavior of someone participating in a specific activity. Since TPB was first put forward, this theory has been applied in various domestic and foreign studies in education, psychology, consumption, health, agriculture, and industry [11]. These studies have provided abundant information and have also shown good operation characteristics and predictive and explanatory effectiveness.

This study adds to past literature by focusing on the behavioral intention, actual participation behavior, and related influencing factors of parents' participation in the home-based online learning of primary school students. The study is conducted based on TPB, and the theoretical model is further revised and expanded in the verification process. Although the relationship between parental involvement and academic performance and learning ability has been widely studied, the findings to date have been inconclusive. Moreover, most researchers have focused on teachers and students in the offline learning process. Empirical studies on parents' participation in primary school students' online learning have rarely been conducted. This study focuses on the following issues through the structural equation model method and by exploring the effects of various factors on parental participation in the home-based online learning of primary school students:

1. What are the main internal and external factors that influence parents' participation in the home-based online learning of primary school students?
2. How do these factors affect parents' behavioral intentions and actual participation behavior?

2. Literature Review and Research Hypotheses

2.1. Relationship between the Behavioral Attitude, Subjective Norm, Perceived Behavioral Control, and Behavioral Intention of Parents Participating in the Home-Based Online Learning of Primary School Students and Their Actual Participation Behavior

Behavioral intention is the optimal indicator for predicting actual behavior and the core factor of behavioral motivation. Behavioral intention can predict the implementation of various behaviors from the dimensions of behavioral attitude, subjective norms, perceived behavioral control, etc., with a high degree of accuracy [12]. Accurate measurement of behavioral intention contributes to a relatively accurate analysis and prediction of the behaviors people have implemented or will implement. It can be regarded as the internal component of consciousness or the conscious forerunner of behavior [13].

In terms of the application of technology to learning activities, researchers have explored related behaviors with TPB and arrived at consistent findings; the attitudes, subjective norms, and perceived behavioral control of university students in mobile learning contexts have a significantly positive influence on their intention to adopt mobile learning [14]. The attitudes, subjective norms, and perceived behavioral control of students at local universities and colleges have different levels of positive influences on their intention to accept massive open online courses (MOOC) [15]. Research on teachers' willingness to participate in school governance shows that subjective norms and perceived behavioral control have a significantly positive influence on teachers' willingness to participate [16].

All the above studies focused on rational behaviors with clear purposes implemented by individuals at specific times and in specific environments. Similarly, parents' participation behavior in the home-based online learning of primary school students is a clear and rational behavior aimed at improving their children's online learning. Thus, this behavior is

within the application scope of TPB. This paper, based on the existing studies, explores the influences of behavioral attitudes, subjective norms, and the perceived behavioral control of parental participation on the parents' behavioral intentions. After parents form a relatively stable behavioral intention, they may make more attempts to help their children with online learning, and the quality of actual participation behavior will be simultaneously improved. The assumptions based on the above analysis are as follows:

H1. *The behavioral attitude of parents participating in the home-based online learning of primary school students has significantly positive influences on participation behavioral intention.*

H2. *The subjective norm of parents participating in the home-based online learning of primary school students has significantly positive influences on participation behavioral intention.*

H3. *The perceived behavioral control of parents participating in the home-based online learning of primary school students has significantly positive influences on participation behavioral intention.*

H4. *The behavioral intention of parents participating in the home-based online learning of primary school students has a significantly positive influence on participating behavior.*

2.2. The Influence of Behavioral Belief and Result Evaluation of Parents Participating in the Home-Based Online Learning of Primary School Students on Behavioral Attitude

Attitude refers to an individual's consistent and persistent tendencies of thought and behavior toward people, things, and the world at large, which can be inferred from the individual's explicit behavior. Not limited to explicit behavior, the connotation of attitude also involves emotion and cognition [17]. As far as the attitude variable of TPB is concerned, its influencing factors mainly include behavioral belief and result evaluation [12].

Behavioral belief is a subject's belief regarding what result will be generated when a specific behavior is implemented. This form of belief has a significant impact on behavioral attitude. For example, behavioral belief of open research data has significant influences on related attitudes [18].

Result evaluation is the subjective evaluation of what result will be produced accordingly by the corresponding behavior. Existing literature indicates that parents make both positive and negative judgments of the results of children's online learning. As the generation of "digital aborigines", primary school students are unprecedentedly being shaped by information technology in their cognition, attitudes, and behavior habits. From the parents' perspective, typical positive judgments of the online learning of primary school students include: the Internet skills learned by children will someday transform into high-income jobs [19]. In addition, a computer is an important tool for children's study and has an important, positive influence on their academic achievements [20]. Many studies have shown that parents agree with the integration of information technology into children's studies, but some have offered different opinions. For example, parents worry that online learning will have a negative influence on their children's physiological development (vision, posture, etc.). They maintain that children's lack of self-control ability and learning ability will lead to low learning efficiency, that children are not able to identify complex information on the Internet, etc. [21].

Online learning is a "double-edged sword", which can play a positive role only when students, parents, teachers, and schools work together to avoid negative effects. This study focuses on the home-based online learning of primary school students, in forms such as school teachers' watching live teaching or available teaching resources provided by teaching, finishing online homework, etc. In the teaching process, teachers supervise and monitor primary school students in various ways, so that negative effects are controlled to a great extent. If parents give a positive assessment of the online learning of primary school students, they will agree with this learning mode and continue to support the subsequent integrated online and offline teaching form, so that school education and home education will be well integrated. Therefore, the result evaluation dimension is concentrated on the positive evaluation of parental participation in the online learning of primary school students. Thus, this study hypothesizes as follows:

H5. *The behavioral belief of parents participating in the home-based online learning of primary school students has a significantly positive influence on the participation behavioral attitude.*

H6. *The result evaluation of parents participating in the home-based online learning of primary school students has a significantly positive influence on the participation behavioral attitude.*

2.3. The Influence on the Subjective Norm of the Normative Belief and Obedience Motivation of Parents Participating in the Home-Based Online Learning of Primary School Students

"Subjective norm" refers to the influence of a behavior implemented toward an individual by surrounding individuals or collectives, which will further change the individual's attitude and intention to conduct corresponding specific behaviors [12]. Normative belief and obedience motivation are the main influencing variables. Normative belief is an individual's prediction of whether other important people or collectives should implement a specific behavior toward him or her; obedience motivation is an individual's intention to obey the expectation of other important people or collectives for him or her [22]. This study takes the parents of primary school students as the object. Their opinions on their children's home-based online learning may be influenced by many factors, such as teachers, parents, committees, media reports, and the children themselves.

The influence of teachers bears the brunt of the analysis. Some studies have pointed out that if teachers take positive actions to guide parents to become teaching collaborators, the parents will take practical measures to support their children's home-based online learning, and the students will become more actively involved in regular school study [7]. Social media platforms have reached a high level of advancement, facilitating communication and interaction among parents. The positive participation or negative responses of different parents to their children's home-based online learning may produce radiation effects. For example, the opinions of parents, committees, and other groups have the most obvious influences. In family education practice, Chinese parents are disconnected to some extent, both in the overall degree of participation and in the participation methods [23]. The long-term inertia of this disconnect conflicts with the realistic demand for parents' in-depth participation needed for home-based online learning. Children spend a long time with their parents in family life, and children play a key role in family interaction. Therefore, it is natural that children will affect their parents. In many cases, as "technological aborigines", children may be more skillful and interested in information technology than their parents. If they take more persuasive strategies, they will influence their parents' attitudes towards information technology [24]. On this basis, the assumptions are as follows:

H7. *Normative belief has a significantly positive influence on the subjective norms of parents' participation in the home-based online learning of primary school students.*

H8. *Obedience motivation has a significantly positive influence on the subjective norms of parents' participation in the home-based online learning of primary school students.*

2.4. The Influence of Parent Network Self-Efficacy and Family Network Conditions on Perceived Behavioral Control

Perceived behavioral control is an individual's self-cognition around the required organization, mobilized resources, and opportunities available when he or she carries out a specific behavior [12]. Perceived behavioral control can reflect actual control conditions and affect actual behavior through the intermediary effect of behavioral intention [25]. Its main influencing variables are control belief and control strength [12]. Taylor et al. further applied self-efficacy and resource conditions to replace the above two influencing variables, and applied them to practical research and a model comparison [26]. Perceived behavioral control involves such questions as: what are the required abilities, resources, and opportunities parents believe they need to help their children with home-based online learning? Do they have the corresponding abilities and opportunities? Can they obtain or seek the corresponding resources? If they do not or cannot, the willingness cannot be achieved, even though they are strongly willing to support their children's home-based online learning.

In other words, perceived behavioral control reflects an individual's existing experience of his or her behavior, and influences the possible obstacles to this behavior as predicted by the individual [12]. Based on existing literature, this study identifies the main influencing factors as Internet self-efficacy and family network conditions.

Self-efficacy is an individual's judgment of his or her ability to implement a behavior. Self-efficacy is mainly formed through four information sources: individual experience, vicarious experience, verbal persuasion, and emotional arousal. The behaviors corresponding to network self-efficacy are online learning, reading and browsing, information inquiry, etc. The level of self-efficacy influences an individual's selection of tasks, his or her efforts, and persistence in the activity under difficult conditions [27]. In the context of online teaching (learning), "conditions" represent external conditions (such as hardware and the Internet) that support the smooth implementation of online teaching [28]. The convenience of external conditions can bring about integrated deep use. Whether parents often use these devices and what activities they use them for (i.e., seeking information, recreation, entertainment, helping children with their studies, etc.) may have substantial influences on their participation in children's home-based online learning. This study measures the access opportunities of the family's network mainly from the aspects of equipment usage degree and direction, and hypothesizes accordingly, as follows:

H9. *Subjective parent network self-efficacy has a significantly positive influence on the perceived behavioral control of participation in the home-based online learning of primary school students.*

H10. *Objective family network conditions have a significantly positive influence on the perceived behavioral control of participation in the home-based online learning of primary school students.*

3. Research Design

3.1. Research Framework

With TPB as the basic framework, in accordance with existing literature, this study identifies the related internal psychological influencing factors, as well as the internal and external restrictive factors, and constructs a path model for parents' participation in the home-based online learning of primary school students (see Figure 1).

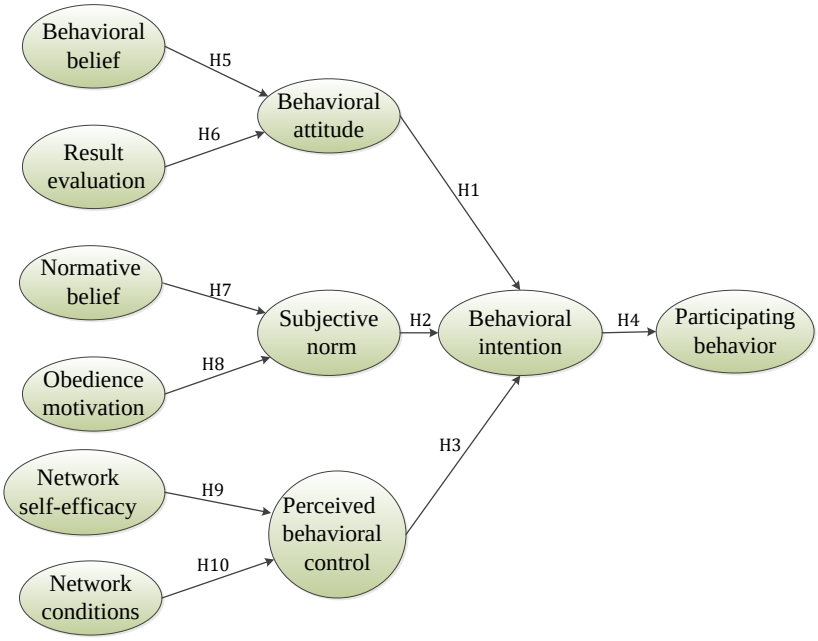

Figure 1. Path model of parents' participation in the home-based online learning of primary school students.

3.2. Research Samples and Collection Methods

In this paper, with the parents of primary school students taken as the research object, the model shown in Figure 1 was empirically studied using a questionnaire survey. The samples were from Shenzhen, Dongguan, and Huizhou. With the help of the sample size calculator provided by The Survey System, the number of required effective samples was calculated to be at least 465. With the cluster sampling method, questionnaires were distributed online. The pre-test lasted from 20 August to 10 September 2022. A total of 148 questionnaires were collected, of which 135 were valid, giving an effective rate of 91.2%. The official investigation lasted from 18 September to 10 October 2022, and a total of 516 questionnaires were collected. Taking whether the Z value of each standardized item was between −3.25 and 3.25 as the standard, extreme values were excluded. Finally, 494 valid questionnaires remained, giving an effective rate of 95.7% (see Table 1 for details).

Table 1. The respondents on the valid questionnaires.

Category	Project	Sample Size	Percentage
Guardian completing survey	Mother	383	77.5%
	Father	111	22.5%
City	Shenzhen	215	43.5%
	Dongguan	133	26.9%
	Huizhou	146	29.6%

3.3. Measuring Tools

Table 2 shows the examples of operational problems, as well as their source references, in each dimension of the research model. The Cronbach α coefficients in each dimension are also shown and were calculated from the pre-test samples. The problems were mainly taken from the corresponding English references. Five doctors of education and doctors of educational technology (including the author) were convened to independently screen the problems and discuss them, and the wording of the problems was then revised. Thus, it is reasonable to believe that the scale has a high level of content validity. A total of 40 observed variables were determined in the questionnaires, and all the questions were measured on a 5-point Likert scale, where 1 = very inconsistent or completely disagree, and 5 = very consistent or completely agree. The higher the score was, the stronger was the respondent's cognition or behavior with regard to the corresponding variables.

Table 2. Examples of latent variable measurement questions and the pre-test reliability test.

Dimension	Examples of Measurement Questions	Source of References	Number of Questions	Cronbach α
Behavioral belief	I think children learning online is very important to improving their academic performance.	Fishbein, M. and Ajzen, I. (1977) [22]	5	0.916
Result evaluation	I think online learning can broaden children's horizons.	Chen S. et al. (2019) [21] Fishbein, M. and Ajzen, I. (1977) [22]	3	0.872
Normative belief	Teachers at school require me to participate in my child's online learning from home.	Fishbein, M.& Ajzen, I. (1977) [22]	3	0.775
Obedience motivation	When I participate in my child's online learning from home, I will consider my child's ideas.	Ajzen, I. (1991) [12] Fishbein, M. and Ajzen, I. (1977) [22]	3	0.706
Network self-efficacy	If I am willing to, I can solve most problems with Internet operation by myself.	Taylor, S. and Todd, P. A. (1995) [26]	3	0.905
Network conditions	I often use electronic equipment to find information online.	Wang C. and Gu X. (2022) [28]	3	0.718

Table 2. *Cont.*

Dimension	Examples of Measurement Questions	Source of References	Number of Questions	Cronbach α
Behavioral attitude	Parents should actively participate in their children's home-based online learning.	Fishbein, M. and Ajzen, I. (1977) [22] Yee, A. Z. H. et al.(2019) [29]	4	0.799
Subjective norm	Friends suggest that I participate in my child's online learning from home.	Ajzen, I. (1991) [12]	3	0.707
Perceived behavioral control	I believe I'm able to participate in my child's home-based online learning.	Ajzen, I. (1991) [12] Justin P. et al. (2016) [30]	6	0.869
Behavioral intention	I am strongly willing to participate in my child's online learning from home.	Fishbein, M. and Ajzen, I. (1977) [22] Taylor, S. and Todd, P. A. (1995) [26]	4	0.831
Participating behavior	I will actively participate in my child's home-based online learning.	Brogan, P. (2000) [19] Yadav R. and Pathak G. S. (2017) [31]	3	0.839

4. Data Analysis

In this study, SPSS21.0 and Mplus7.4 software were the main programs used for data analysis. The analysis methods were dominated by structural equation modeling, including first-order confirmatory factor analysis, parameter significance estimation, synthetic reliability, convergent validity, discriminant validity, and regression analysis.

4.1. Descriptive Statistics

The data from the questionnaires were processed with SPSS21.0. The results show that the average value is between 2.47 and 4.04, and the standard deviation is between 0.833 and 1.194. The responses of respondents to most questions were between "neutral" and "very consistent". The average scores of most questions are between 2.5 and 4, without over-concentration of options. The mean values, medians, and modes of most questions are close, with the data, on the whole, conforming to a normal distribution. The absolute value of skewness of each question is less than 1, and the absolute value of kurtosis is less than 7, indicating that all questions conform to a univariate normal distribution.

4.2. Measurement Model Evaluation

After confirmatory factor analysis of each dimension using Mplus7.4, it was found that there is one question for which the standard factor load is less than 0.5 in each of the dimensions of obedience motivation, home information access opportunities, and participating behavior. These questions were thus deleted. The standardized factor loads of the remaining 37 questions are all greater than or close to 0.6, and most of them are within the ideal level range of 0.7–0.9. Thus, these questions have higher reliability and were reserved (see Table 3 for details). The square multiple correlations (SMC) of most questions, i.e., the squares of the corresponding standardized factor loads, reach an ideal level of more than 0.5.

After the non-standardized factor load of the first question in each dimension was fixed as 1, the estimated value of each parameter obtained is greater than 0, and the corresponding p value is less than 0.001, reaching a very significant level. Composite reliability (CR) is between 0.575 and 0.900, and most values reach the ideal level. The average variance extracted (AVE) is between 0.403 and 0.796, meaning that the 10 dimensions have strong average explanatory power with regard to the questions involved, and the internal reliability in each dimension reaches an ideal or acceptable level; there is clear convergence validity in each dimension. As shown in Table 4, the roots of AVE values of the 11 latent variables in the model in Figure 1 are all greater than most of the correlation coefficients between each variable and the other variables, indicating that there is clear discriminant validity among the dimensions.

Table 3. Factor load, reliability, and convergence validity of each dimension.

Dimension	Number of Remaining Questions	Reliability of Questions		Composite Reliability	Convergence Validity
		Factor Loading	SMC	CR	AVE
Behavioral belief	5	0.709–0.860	0.503–0.745	0.896	0.634
Result evaluation	3	0.679–0.810	0.461–0.656	0.805	0.580
Normative belief	3	0.570–0.751	0.325-0.564	0.670	0.407
Obedience motivation	2	0.836–0.945	0.699–0.893	0.886	0.796
Network self-efficacy	3	0.751–0.789	0.564–0.623	0.819	0.601
Network conditions	2	0.620–0.650	0.384–0.423	0.575	0.403
Subjective norm	3	0.741–0.894	0.549–0.799	0.880	0.711
Behavioral attitude	4	0.684–0.903	0.468–0.815	0.900	0.695
Perceived behavioral control	6	0.664–0.837	0.441–0.701	0.898	0.596
Behavioral intention	4	0.775–0.856	0.601–0.733	0.887	0.664
Actual participating behavior	2	0.889–0.893	0.790–0.797	0.885	0.794

Table 4. Discriminant validity of the measurement model.

Dimension	Convergence Validity	Discriminant Validity										
	AVE	1	2	3	4	5	6	7	8	9	10	11
1. Behavioral belief	0.634	**0.796**										
2. Result evaluation	0.580	0.343	**0.762**									
3. Normative belief	0.580	0.609	0.087	**0.762**								
4. Obedience motivation	0.796	0.254	0.015	0.589	**0.892**							
5. Network self-efficacy	0.601	0.352	0.047	0.455	0.092	**0.775**						
6. Network conditions	0.403	0.659	0.180	1.063	0.747	0.265	**0.635**					
7. Subjective norm	0.711	0.572	0.088	0.880	0.301	0.460	0.896	**0.843**				
8. Behavioral attitude	0.695	0.752	0.333	0.448	0.185	0.258	0.492	0.421	**0.834**			
9. Perceived behavioral control	0.596	0.484	0.110	0.731	0.414	0.570	0.616	0.649	0.359	**0.772**		
10. Behavioral intention	0.664	0.512	0.115	0.723	0.333	0.475	0.673	0.721	0.416	0.770	**0.815**	
11. Actual participating behavior	0.794	0.352	0.079	0.497	0.229	0.327	0.463	0.496	0.286	0.530	0.688	**0.891**

Note: The diagonal items in bold on the discriminant validity matrix are the roots of AVE, and the lower triangular matrix presents the Pearson correlation values.

4.3. Structural Model Evaluation and Hypothesis Testing

As the individual fit index (*RMSEA*) obtained by the maximum likelihood (ML) method slightly exceeds the critical value required for good model fitting, the mean adjusted likelihood method (MLM) was further used for correction. Table 5 shows the fit index obtained using estimating structural model analysis. One can see that $\chi^2/df < 3$, CFI > 0.9, *TLI* > 0.86, *RMSEA* < 0.08, and *SRMR* < 0.08. Most of the fit indexes thus reach or approach the accurate fitting standard, and some fit indexes (*SRMR*) meet the acceptable requirements. Nine of the hypotheses put forward in this study are thus verified. Table 6 shows the specific influence effects of each path with significant influence.

Table 5. Fit indexes of the structural equation model.

Estimation Method	χ^2	*df*	χ^2/df	*CFI*	*TLI*	*RMSEA*	*SRMR*
ML	1698.066	604	2.811	0.871	0.841	0.086	0.061
MLM	1465.968 *	604	2.427	0.902	0.861	0.076	0.061

Note: * represents the result of the MLM method.

Table 6. Model regression weights and hypothesis test results.

Dependent Variable	Independent Variable	Estimate	S.E.	Z-Value	*p*-Value	R^2	Results
Behavioral intention	Behavioral attitude	0.083	0.029	2.900	**	0.683	Consistent
	Subjective norm	0.355	0.045	7.965	***		Consistent
	Perceived behavioral control	0.510	0.039	13.242	***		Consistent
Actual participation behavior	Behavioral intention	0.688	0.030	22.594	***	0.473	Consistent
Behavioral attitude	Behavioral belief	0.723	0.035	20.848	***	0.572	Consistent
	Result evaluation	0.085	0.047	1.815	0.069		Inconsistent
Subjective norm	Normative belief	0.870	0.051	17.059	***	0.848	Consistent
	Obedience motivation	0.335	0.064	5.253	***		Consistent
Perceived behavioral control	Network self-efficacy	0.437	0.052	8.366	***	0.557	Consistent
	Network conditions	0.500	0.045	11.228	***		Consistent

Note: *** $p < 0.001$, ** $p < 0.01$.

5. Discussion

5.1. Objectives and Hypotheses That Have Been Achieved or Have Not Been Achieved with This Research

In this study, based on TPB and existing literature, a behavioral model of parents' participation in the home-based online learning of primary school students is established by exploring some internal and external restrictive factors. The model is used to explain what factors may influence parents' actual participation behavior and what is the influencing path when home-based online learning lasts for a long time. This study shows that, except for Hypothesis H6, the other nine hypotheses have been verified, and Hypothesis H1 has reached the significance level of 0.01; the other eight hypotheses have reached the significance level of 0.001.

5.2. Main Findings of This Work

The main findings of the study are as follows:

1. The behavioral attitudes, subjective norms, and perceived behavioral control of parents participating in the home-based online learning of primary school students have significantly positive influences on participation behavior intention. This result is consistent with prior research [14,15]. As for the order of influence on the behavioral intention of parents participating in the home-based online learning of primary school students, perceived behavioral control has the greatest influence, followed by subjective norms, and finally behavioral attitudes. This order of influence found in this study is different from that found in prior studies [15].
2. The behavioral intention of parents participating in the home-based online learning of primary school students has a significantly positive influence on their actual participation behavior. This result is consistent with prior studies examining adults' participation in online learning communities [32], which reflects the universal influence of behavioral intention on actual participation behavior;
3. Behavioral belief is found to have a significantly positive influence on behavioral attitude. This finding is consistent with those of prior studies [20]. However, the result evaluation with regard to parents' participation in the home-based online learning of primary school students has no evident influence on their behavioral attitude, and this finding is inconsistent with other research results to date [20];

4. Normative belief and obedience motivation both have significantly positive influences on the subjective norm of parents participating in the home-based online learning of primary school students. In addition, the influence of normative belief clearly exceeds that of obedience motivation. This finding echoes the conclusions of prior studies [7], namely that school teachers and children have been found to play a key role in terms of communication and interaction in parents' use of information technology at home;
5. Parents' network self-efficacy and conditions have an evident influence on the perceived behavioral control over their participation in children's home-based online learning. These findings are consistent with the corresponding theoretical explanation provided by Taylor et al., which uses corresponding theoretical interpretation on the competitive model matching of information technology [26];
6. The R-square value of each structural model has reached a moderate or high level of influence (see Table 6 for details). This verifies the high applicability of TPB to the issue of parents' behavior of participating in the home-based online learning of primary school students.

5.3. The Implications of These Results in the Field of Study of the Research

Up to now, few studies have been conducted on parents' participation in the online learning of primary school students. This study supports the effective implementation of home-based online learning of primary school students and the joint effect of home-school co-education from the perspective of parents in the subsequent implementation of integrated online and offline teaching.

One possible reason for the different order of influence on the behavioral intention is that prior studies were mainly based on students at vocational colleges [15]. As the learning subject, students can directly feel their difficulties in learning, and generally have a lower level of perceived behavioral control over their own behaviors than adults. Thus, guiding them to take a correct learning attitude has a more significant influence on their behavioral intention. Parents mainly get involved in and assist the online learning of primary school students, instead of learning by them. Whether their attitude is positive, and whether or not they feel pleased, parents should nonetheless provide appropriate conditions for children's home-based online learning, specifically from the aspects of knowledge, ability, opportunities, and time, with stronger feeling in perceived behavioral control.

There are universal influences of behavioral intention on actual participation behavior. First, parents should have a clear and genuine intention to participate in and assist their children's online learning from home. Only in this way can the intention be transformed into real participation behaviors, thus improving the behavior effect. This intention involves the creation of conditions for implementing participation behavior, the active improvement of participation ability, and other aspects. Parents' beliefs about the ability of online learning to improve the cognitive ability and academic performances of primary school students will influence the degree and frequency of parents' participation in the home-based online learning of those students. Parents' acceptance that online learning can promote students' personality development, as well as their belief in media publicity, the appeals and requirements of teachers and parent committees, the ideas generated by primary school students in their learning process, and parents' knowledge, skills, resources, and time spent on Internet use will also be factors.

The respondents were from the Pearl River Delta region, which has a relatively developed economy. Primary school students using online learning is a common learning behavior there, and this method has been recognized by parents. Some possible negative impacts on students' vision health and other factors will not influence parents' participation and support. Parents' participation and assistance enable online learning to reach its full potential in this critical period. Moreover, online learning gradually forms complementary advantages with offline learning, jointly promoting the development of various important qualities in primary school students.

Online learning was the only learning mode used by the sampled primary school students during this investigation. With the joint efforts of academic circles, educational and administrative departments, schools, and teachers, online learning is now more systematic than before in terms of knowledge transmission, skill training, subject quality development, and the improvement of learning ability. Thus, the influence of result evaluation on participation behavior attitude tends to be weakened.

When the parents and their children experience major social events together, some contents appear that cannot be taught directly to children through textbooks. Parents can take this opportunity to make full use of home education, cultivating their children through online learning in their living habits, self-management ability, gratitude, sense of responsibility, life, career planning, etc. They can obtain relevant materials from online learning and train children to develop their abilities to identify information, select beliefs, and avoid the negative effect of information overload.

Network self-efficacy is a subjective feeling, while network conditions are an element of objective reality. A potential connection exists between them; if parents' network self-efficacy is low, perhaps they will be unwilling to carry out related activities, which will naturally lead to a lack of conditions. If parents are confident in dealing with the Internet and if they use the Internet at home more frequently, this will promote their children's understanding of the knowledge, skills, resources, and time required for online learning. After the basic hardware is prepared, encouraging children to learn online from home relies on their parents' judgment and confidence in their own and their children's use of the Internet.

5.4. Limitations of This Study

This study only uses survey research methods and does not fully include participation strategies that better reflect parents' "practice wisdom". In addition, all the samples of this study are from economically developed areas. The analyses made of the participating intention, behavior, and influencing variables of the parents of primary school students in the less-developed central and western regions of China may not fully apply and conform to the hypotheses and models set in this study.

5.5. Future Lines of Research

In the process of subsequent normalized learning, when integrated online and offline teaching is implemented, it is worth exploring the differences between the behavioral patterns, related influencing factors, and paths of parents participating in the online learning of primary school students. Research methods such as in-depth interviews can be adopted in future studies to collect corresponding information, so as to discover the special and general participation strategies adopted by parents. Efforts can also be made to study the popularization value of special strategies, the rationality and effectiveness of general strategies, etc. Additionally, the differences in the participating behaviors of parents at different economic statuses and different schooling periods can be examined.

6. Conclusions and Recommendations

Behavioral belief, normative belief, and obedience motivation have significantly positive influences at medium and high degrees on the behavioral attitudes and subjective norms of parents participating in the home-based online learning of primary school students. Teachers and students play a key role in the process of parents' participation in home-based online learning, and parents will seriously consider the opinions and suggestions of these important parties. The achievements and platforms of online learning can and should become the carrier of home-school cooperation and home-school co-education and can play multiple roles as the content achievement of home-school co-education. With the development of information technology and its deepening application in education, during weekends and vacations, students' homework, labor, art, sports, and other activities during their growing process can be recorded and shared through the schools' or local edu-

cation bureaus' online platforms. This will help achieve the "five measures of education" in home-school cooperation and adjust the cooperation measures to keep pace with the times. With these means of communication, collaboration among teachers, parents, and students will be established in a more targeted and specific manner. Thus, the quality of online teaching and student learning will be improved [33]. Parents will be more aware of how important online learning can be to the work and life of primary school students, and a positive effect on online learning will be achieved through joint efforts. Network self-efficacy and conditions have a significant influence on the perceived behavioral control of parents participating in the home-based online learning of primary school students, and thus influence their behavioral intention and actual participation behavior. Family is the micro-field of education activities. Parents should strive to nourish their children's ability to distinguish between entertainment preference and learning preference in the application of information technology. Parents should also help their children form good learning habits and cognitive and non-cognitive abilities that will enable them to correctly use information technology tools. During the COVID-19 pandemic, most people had more time to stay at home and play games together. If there is no intimacy among team members, players cannot experience a flow state or perceived game values [34]. They can carry out training on the concept, technology, and guiding ability of parents in participating in children's online learning with the help of carriers, such as parents' meetings, campus open days, parents, and schools. These methods will improve parents' recognition of online learning, network self-efficacy and give them confidence in participating in children's online learning. This, in turn, will help to achieve a greater probability of effectiveness in assisting children in home-based online learning.

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