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Enhancing classroom management through parental involvement by using social networking apps

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The purpose of this study is to explore the classroom management effectiveness enhancement by using social networking apps through electronic devices such as smartphones, tablet computers, and personal computers, as well as the role of parental involvement. Quantitative research was conducted, and the Structural Equation Modelling (SEM) statistical technique applied. From 15 different Changhua County primary schools in Taiwan, 411 teachers were chosen using stratified random sampling in proportion to the size and location of schools. Each teacher was invited to fill out a questionnaire. A total of 403 (98.05%) questionnaires were returned, with 382 (92.94%) considered valid. In order to confirm the statistical results, a focused group interview was also conducted. The effects of the behaviour intention of using Line, parental involvement, and classroom management effectiveness were all found to be positively associated with one another. Moreover, the mediating role of parents in the relationship between the behaviour intention of using Line and classroom management effectiveness enhancement was also supported and confirmed.

Keywords: behaviour intention; classroom management effectiveness; parental involvement; social networking apps; Taiwan's primary schools

Background

Parents are the first educators and teachers of their children. They play a primary role in their children's family education. Kraft and Dougherty (2013) identified three primary mechanisms that most likely to affect the engagement: stronger teacher-student relationships; expanded parental involvement; and increased student motivation. Getting parents involved in their children's learning is just as important as teacher teaching students. Studies show that the more the parents are involved in their children's education, the higher their children's success rate will be at school. Parental involvement is highly important in pushing the public school systems to higher standards (Cox, 2012; Machen, Wilson & Notar, 2005). However, parents usually do not actively involve themselves in their children's schooling due to their busy schedules (Kraft & Dougherty, 2013). This study purposely selects parents who do not usually participate in their children's education. A variety of tools were introduced for the purpose of this study which include: use of social networking platform; provide flexible scheduling for school events; establish parent-teacher text and voice conferences; inform parents about what their children are learning; and help parents create a supportive environment for children's learning at home. In order to mitigate classroom challenges and enhance classroom management effectiveness, parents and teachers are encouraged to work together according to Machen et al.'s, and Cox's studies, mentioned above. Strong relationships and communication between schools and families are beneficial for children, as well as parents and schools (Loudová, Havigerová & Haviger, 2015). According to Ng and Yuen (2015), partnership between teachers and parents can enhance positive development of children's self-concept. This finding has drawn the attention of school personnel and the general public to the issue of parental involvement (PI) in schools. In the educational setting of Taiwan elementary school, teachers and parents tend to exhibit a strong link (Hou & Chiang, 2010). This is a unique traditional culture in Taiwan. Normally, each class will establish a parent-committee to facilitate teaching policy at home and exchange ideas with teacher at school or over the phone (Wu, 2015). Through the effort of parent-committee, parental involvement can provide substantial impact on classroom management in terms of learning achievement and character education (e.g. proper behaviour on the part of students).

In the era of information technology, there are diverse means of communication. Although teachers are often instructed to put their phones away during instruction, the use of smartphones by teachers in K-12 education has been contentious (Cosier, Gomez, McKee & Maghzi, 2015). The use of information systems such as a smartphone can support knowledge sharing and collaboration opportunities otherwise not feasible. As an example, teachers can use smartphones to collaborate with other teachers, paraprofessionals, related service providers, and parents, when a face-to-face discussion is not possible (Cosier et al., 2015).

Parent-teacher communication represents a primary form of parental support, a phenomenon meriting significant attention given the connections between support and academic achievement (Thompson, Mazer & Grady, 2015). The efficiency of parent-teacher communication could be enhanced through the use of smartphones. Moreover, an increase in parents' preference for frequent email communication, as well as for emerging modes of parent-teacher communication, such as text messaging and social media (Thompson et al.,

2015). According to the "Consumer Survey Analysis for Mobile Application" by the Institute for Information Industry (III), the highest-ranking type of application (or app) for everyday use by smartphone users was a social networking app, accounting for up to 80.9% of the total available apps. The top three social networking apps were Line, Facebook, and YouTube. This indicates that social activities via Line and Facebook have become commonplace (Life is inseparable from LINE and FB 8 into the daily use of social communication apps, 2016). The III found that there were 17 million Line users in Taiwan, which ranked third highest in the world for usage of the app. One important reason is that Line provides free service and is mainly used on smartphones. Despite being a free app, Line brought in $338 million of revenue for its parent company in 2013, where most of Line's revenue comes from sales of stickers and games (Heggestuen, 2013).

Line provides numerous group message functions, such as various transfer functions, free short message service voice calls, and multiservice support (Life is inseparable from LINE and FB 8 into the daily use of social communication apps, 2016) - see Figure 1. Based on the above statements, the working theory of the study can be described as: Using Line as a platform or bulletin board can upgrade classroom management effectiveness through facilitating the interaction between teachers and parents. This explains why communication solutions such as Line can be closely associated with classroom management and parental involvement. Moreover, in an emerging economy such as South Africa, a society encompassing a wide variety of cultures, languages, and religions (Skinner, 2017) similar to that of Taiwan, it is necessary for the educational system to extend its focus from a unitary management method to a multiple management method by applying new digital technology into classroom management.

Figure 1 Parents can easily access their children at school over smartphones or other electronic devices through social networking apps

Although the use of Line in classroom management (CM) has been increasing among Taiwan's primary school teachers, few studies have been conducted on this topic. However, Jayson (2014) has claimed that social media research raises privacy and ethical issues. Moreover, teachers' after-school workloads are another potential risk. Therefore, the main research focus of this study will be: (1) is using Line an effective means of enhancing CM in Taiwan's primary schools; and (2) what is the role of parents in educational settings?

Literature Study

Behaviour intention

Parent-teacher associations can help strengthen good home-school relations. However, most parents complain that sometimes the timing of meetings clashed with their personal engagements (Okeke, 2014). Notwithstanding the numerous benefits associated with effective parental involvement in the schooling of their children, most parents complain of lack of time, or of having nothing to contribute (Sheng, 2012). Asynchronous schedules of teacher and parent support use e-communication instead. Teachers, who have developed good classroom management skills, including time management, may be better able to apply these skills to encouraging parental involvement, including through social networking apps. Can teachers and parents accept social networking apps, such as Line, to enhance classroom management effectiveness? Davis (1989) proposed the technology acceptance model, which is mainly used to explain and predict user acceptance of information systems and information technology. The components of the model are behaviour intention (BI); actual behaviour; attitude towards use; perceived usefulness; and perceived ease of use (Chau & Hu, 2002). The concept of perceived risk was originally established in 1960 by Bauer, who indicated that consumer purchase behaviours were likely to lead to outcomes that were difficult to predict and potentially unpleasant (Zhang, Wan, Huang & Yao, 2015). Accordingly, as the most popular social networking app in Taiwan, Line was chosen as the online technology for communication between teachers and parents. The present study therefore categorised the scale of BI into three indicators: usefulness - having a beneficial use; ease of use - perceived easy to use; and perceived risk - acknowledged potential risk (Bauer, 1960; Chau & Hu, 2002). Thus, BI was recognised as a variable to test the degree of teacher's perspective on using Line to facilitate communication with parents for classroom management.

Classroom management

With the increasing need of individualised instruction in Taiwan, teachers commonly report

classroom management (CM) to be one of their greatest challenges (Wu, 2015). CM involves teachers' efforts to oversee classroom activities such as learning, social interaction, and student behaviour (Ritter & Hancock, 2007). One of the critical responsibilities of teachers is to create and maintain a supportive, positive, and orderly classroom environment that is conducive to learning. To accomplish such a challenging task, they must possess the necessary CM skills. However, evidence from research on prospective teachers' classroom management belief is necessary to enhance efforts to improve professional readiness alongside work as well as to develop and implement effective teacher training programs (Caner & Tertemiz, 2015). Classroom management can be defined as teachers' ability to cooperatively manage time, space, resources, and students' roles and behaviours, so as to provide a climate that encourages learning (Edwards & Watts, 2010). Osakwe (2014) claimed that effective CM begins with mutual respect and the establishment of interpersonal relationships, which is crucial to improving student achievement and teacher self-efficacy (defined as a personal judgment of how well one can execute courses of action required to deal with prospective situations). Cosier et al. (2015) have suggested that teachers should use text messaging on a regular basis to work together to make modifications, communicate about student behaviour, share student work, and review student progress against the goals.

Moreover, Matejevic, Jovanovic and Jovanovic (2014) argued that schools should establish partnerships with families, through which they can offer relevant information about the effects of various parenting styles on student achievement. In Taiwan, Line was used as a platform to bridge teacher and parents in regard to students' behaviour, learning and achievement in the classroom (Hwang, Ke & Jeng, 2017). Line provides a bulletin board for teachers and parents to communicate freely and without interrupting each other. The above statements provide a theoretical rationale for why texting parents through Line would influence classroom management. Accordingly, three indicators were applied in measuring the scale of CM effectiveness in the present study: (1) teaching management: managing teaching content; (2) discipline management: training for behavioural changes based on the concepts of creating learning individuals and school; and (3) cohesion management: improving students' health, teamwork ability, and engagement in school to assist them in achieving their potential (Wu, 2015). The cognition (knowledge) of using Line to enhance the effectiveness of CM by teachers was considered as a potential variable and also tested in this study.

Parental involvement

Parental involvement is defined as the activities occurring between a parent and a child or between a parent and teachers at school that may contribute to the child's educational outcomes and development (Abdullah, Seedee, Alzaidiyeen, Al-Shabatat, Alzeydeen & Al-Awabdeh, 2011). Moreover, Hou and Chiang (2010) divided their model on PI in education into the following components: (1) family involvement, comprising at-home learning activities, parenting, and supervision of children's homework; (2) school involvement on particular matters, comprising participation in school activities and participation in school meetings; and (3) persistent school involvement, comprising teacher assistance, volunteering, and family communication. Furthermore, Okeke (2014) suggests eight strategies that would help strengthen and ensure the effective parental involvement in the schooling of children, which include: (1) a national policy on parent involvement; (2) parents' involvement in curriculum matters; (3) parents' evenings; (4) home visits; (5) school childcare policy for nursing mothers; (6) parent-teacher games; (7) school debates and speech days; and (8) parent-teacher associations. However, it is not clear if switching online learning to online communication, in terms of parental involvement, will enhance CM through PI by using social networking apps. Borup, Graham and Drysdale (2014) found however that teachers of K-12 students worked hard to improve student outcomes in online learning by facilitating discourse with students and parents. Moreover, parental involvement is a form of investment in educational goods, which ultimately leads to a high rate of return in national economies (Heckman & Mosso, 2014). Two indicators were also employed in measuring the scale of PI in the present study, namely family education: focusing on healthy family functioning within a family systems perspective, and providing a primarily preventive approach, and school education, viz. the process of receiving or giving systematic instruction, especially at a school or university (Epstein, 2011; Margaritoiu & Eftimie, 2011; McAllister Swap, 1993). Based on the statements above, PI may become as a mediating variable between teachers' behaviour intention of using Line and cognition of enhancing CM effectiveness.

Theoretical Hypotheses

Palts and Harro-Loit (2015) have indicated that different patterns enable teachers to apply various communication strategies to efficiently involve parents in the educational development of their children. The research of Ho, Hung and Chen (2013) posited that attitude ought to be treated as a mediator between perceived usefulness and

behaviour intention, even if the user perceives the new device is useful, but does not hold a positive attitude toward the device. Therefore, teachers' behaviour intention of using Line on CM through parental involvement was the first question to ask and the following hypothesis was proposed in the present study:

> H_1: The BI of using Line among primary school teachers is positively associated with perceived CM effectiveness.

Nzinga-Johnson, Baker and Aupperlee (2009) identified that both parents and teachers perceived relationship quality to moderately/strongly predicted teacher/reported parental involvement, regardless of racial/ethnic and socioeconomic factors. Parent/teacher communication is evolving with the development of smartphones and other new communication technologies. As schools invest in websites, phone calling systems, parent portals, online curriculum, and other types of technologies that connect schools to home, research needs to continue to focus on the effectiveness of these technologies in increasing parental involvement (Olmstead, 2013). Thompson et al. (2015) also argued that using new technology increases parental involvement in schools. Therefore, in the present study, the following hypothesis was proposed:

> H_2: The BI of using Line among primary school teachers is positively associated with PI.

Teachers reported classroom management problems in relation to physical environment, planning, time management, relationship management, and behaviour management that have a connection to students, teachers, schools, classes, curricula, courses, and parents (Akın, Yıldırım & Goodwin, 2016). Moreover, Freiberg, Huzinec and Borders (2008) indicate that the use of person-centred classroom management provides significant, positive effects on student achievement in mathematics and reading. Teachers, administrators, and policy makers have all recognised the impact of PI on student academic achievement as an integral part of new educational reform and initiative (Wilder, 2014). Furthermore, Castro, Expósito-Casas, López-Martín, Lizasoain, Navarro-Asencio and Gaviria (2015) claimed that the parental models most closely linked to high student achievement are those focusing on general supervision of children's learning activities. Therefore, the following hypothesis was proposed in the present study:

> $H_{3\text{-}1}$: PI is positively associated with perceived CM effectiveness.

However, it is conceivable that this effect is not unidirectional, i.e. that classroom management of a teacher may also influences parental involvement.

> $H_{3\text{-}2}$: CM effectiveness is positively associated with perceived PI.

Parental Involvement in Classroom Management is important for parents to be actively engaged in their children's education. The earlier the parents become involved in their children's education, the more powerful it will be in the long run. Communication is a key element for positive parental involvement, especially with their children's teacher (Hayes, 2012). There are various communication opportunities available to teachers and parents given the emerging advances in technology (Graham-Clay, 2005). Thus, parents can play a mediating role in the relationship between the BI of using Line and CM, having both direct and indirect effects.

> H_4: PI moderates the relationship between the BI of using Line among primary school teachers and CM effectiveness.

Teachers and parents can enhance their understanding of how email can be used to effectively communicate, as well as improve student performance and academic success (Kilgore, 2010). Therefore, in the present study, following hypotheses were proposed:

> H_5: Various indicator variables of BI exhibit significant effects on indicator variables of CM effectiveness.
>
> H_6：Various indicator variables of PI moderate the relationship between indicator variables of BI and indicator variables of CM effectiveness.

Base on the study above, Figure 2 presents behaviour intention (BI) as a latent independent variable, classroom management (CM) as a latent dependent variable, and parent involvement (PI) as a latent mediator variable. The concept in the ellipse represents the main construct variable, whereas that the rectangle represents the indicator variables of main construct.

Method

Sample

Changhua County is situated in the mid-western part of Taiwan Island and has a population of 1,287 million. The County primary school teachers were employed as the sample population for the questionnaire survey. The testing method was stratified and random. According to the classifications of the Department of Education Changhua County Government (2014) in 2014 academic year, the school size scales were divided into four levels: 12 classes or less; 13 to 24 classes; 25 to 48 classes; and more than 49 classes. Of a total of 411 questionnaires sent, 403 were received back from surveyed teachers; with 382 considered valid, and yielding a recovery rate of approximately 92.94 percent. The characters of sampling are presented as Table 1.

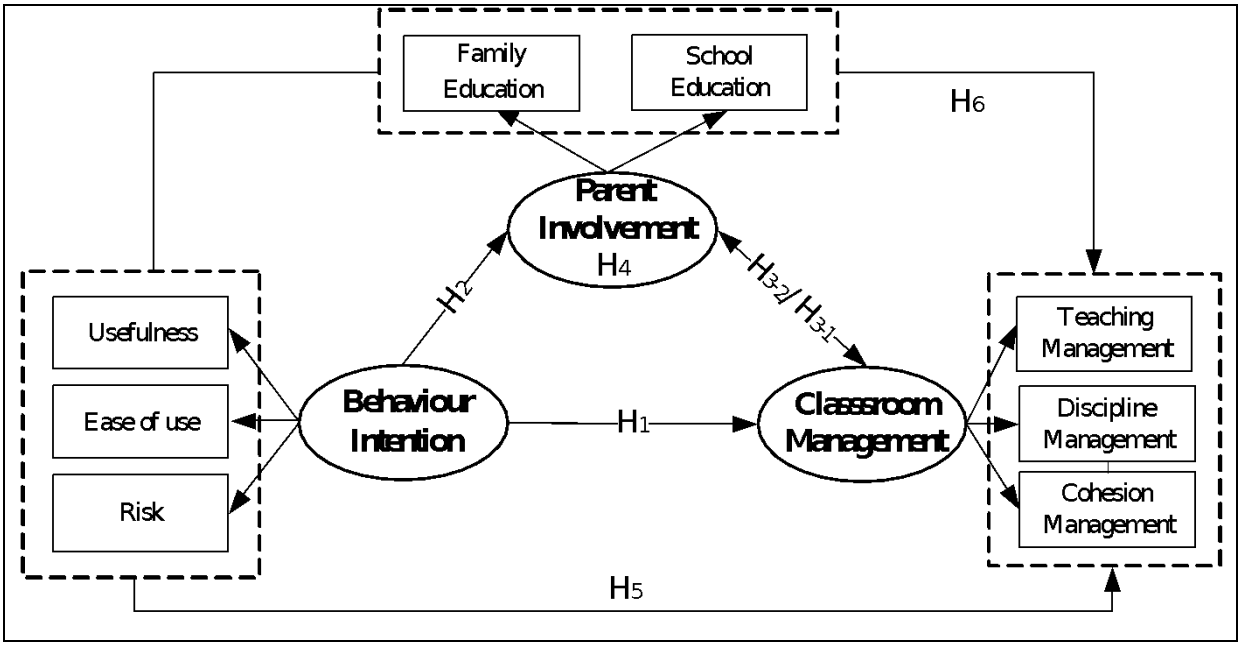

Figure 2 The conceptual model

Table 1 The specify stratum of sampling

Stratum	*N* of class	Proportion of class	*N* of send	*N* of return	*N* of valid	Recovery rate
Under 12 classes	759	25	103	100	95	92.94%
13–24 classes	628	21	86	86	83	
25–48 classes	960	32	131	129	119	
Above 49 classes	666	22	91	88	85	
	3,013	100	411	403	382	

Note. Source: Department of Education Changhua County Government (2014).

Procedures

The questionnaires were given to the participants during school hours. All participants received same questionnaire comprising two sections. The first section consisted of demographic information, whereas the second consisted of 43 items: 16 about BI, 10 about PI, and 17 about CM. All items were based on a five-point Likert scale. The average time for completion of each questionnaire was 25–30 min. After the quantitative survey, a focused group interview was conducted with one director and six teachers getting together to discuss the study topic and share their ideas during the interview.

Measures

Structural equation modelling is a powerful and versatile approach that offers many advantages over traditional manifest variable analysis, including closer attention to measurement, more accurate effect size estimates, and the ability to test questions that simply cannot be tested using traditional method (Little, 2013). Moreover, in most applications the confirmatory factor analysis (CFA) is used to study the relationships between a set of observed variables and a set of continuous latent variables. CFA is also frequently used as a first step to assess the proposed measurement model in a SEM (McDonald & Ho, 2002). SEM, in comparison with CFA, extends the possibility of relationships among the latent variables and encompasses two components: (1) a measurement model (essentially the CFA) and (2) a structural model (Schreiber, Nora, Stage, Barlow & King, 2006). Based on the statistical data of measurement model analysis, the indices of three main construct variables are exhibited in Table 2, analysed via confirmatory factor analysis to test how well the measured variables represent the number of constructs. All structural parameter estimates and goodness-of-fit (GFI) indices met the standardised values.

In order to determine the significant difference and adequate model fits, factor loadings greater than .7 were retained (Hair, Black, Babin, & Anderson, 2010; Hulland, 1999; Kline, 2011; Little, 2013); indices of construct reliability are shown in Table 3. To acquire accurate construct reliability values, Fornell and Larcker (1981) proposed that the value of composite reliability must exceed .7, and average variance extracted (AVE) must exceed .5. Thus, all statistical data are revealed as proper values and considered an adequate model presented in Table 3.

Table 2 Index of confirmatory factor analysis

Indicators	Standardised value	Behaviour Intention (BI)	Parental Involvement (PI)	Classroom Management (CM)
Goodness of fit index (GFI)	> .9	.937	.988	.943
Adjusted goodness of fit index (AGFI)	> .9	.908	.971	.911
Root mean square residual (RMR)	< .08	.034	.016	.027
Standardised root mean square residual (SRMR)	< .08	.0315	.0201	.0327
Root mean square error approximation (RMSEA)	< .08	.064	.030	.066
Normed fit index (NFI)	> .9	.963	.994	.968
Comparative fit index (CFI)	> .9	.971	.997	.976
χ^2		181.642	16.107	133.632
df		71	12	50
Normed chi-square	< 3	2.558	1.342	2.673

Table 3 Reliability of constructs (N = 382)

Construct	Measure	Factor loading[a] (> .7)	Composite reliability (> .7)	AVE (> .5)
Behaviour intention	BI			
Usefulness	BI1: LINE for parent-teacher communication increases communication efficiency.	.796	.914	.641
	BI2: LINE for parent-teacher communication to understand each other's needs.	.848		
	BI3: LINE for parent-teacher communication to understand what students learn at home.	.783		
	BI4: LINE for parent-teacher communication can help parents understand their children's teachers' education philosophy.	.781		
	BI5: LINE for parent-teacher communication through text messaging.	.722		
	BI6: LINE for parent-teacher communication is helpful.	.865		
Ease of use	BI7: LINE for parent-teacher communication is convenient.	.820	.909	.667
	BI8: LINE for parent-teacher communication is flexible.	.866		
	BI9: LINE can diversify parent-teacher communication.	.819		
	BI10: LINE enables easy communication between parents and teachers.	.825		
	BI11: LINE for class communication can enable parents and teachers to interact efficiently.	.749		
Risk	BI14: LINE for parent-teacher communication may lead to excessive interference from parents.	.795	.838	.632
	BI15: LINE for parent-teacher communication could reduce teachers' professional autonomy.	.777		
	BI16: LINE for parent-teacher communication may result in unresolved problems due to a divergence of views.	.813		
Parental involvement	PI			
Family education	PI1: Parents' wishes to improve education at home for their children.	.723	.782	.544
	PI3: Parents help their children to learn	.719		

Construct	Measure	Factor loading[a] (> .7)	Composite reliability (> .7)	AVE (> .5)
	relevant data and materials.			
	PI5: Parents improve the counselling of children at home.	.770		
School education	PI6: Parents increase the level of concern regarding school information.	.771	.859	.604
	PI7: Parents participate in school activities.	.815		
	PI8: Parents are happy to become members of the parent group.	.750		
	PI10: Parents are happy to participate in school conferences.	.770		
Classroom management	CM			
Teaching management	CM2: Parents' human resources increase teaching efficiency.	.764	.907	.661
	CM3: Parents can create a supportive environment to facilitate the teaching process.	.838		
	CM4: Improvements in education facilitate the achievement of teaching goals.	.826		
	CM5: Enhancing parent-teacher communication may improve teaching standards.	.833		
	CM6: Parents can communicate with teachers any time and understand their teaching needs.	.801		
Discipline management	CM7: Discovery and prevention of improper and deviant behaviours among students.	.873	.901	.752
	CM8: Control and minimise improper and deviant behaviours among students.	.893		
	CM9: Guide and improve students' behaviours to minimise improper and deviant behaviours.	.834		
Cohesion management	CM14: Teachers and students are willing to share and seek solutions when problems are encountered.	.799	.901	.696
	CM15: Create a class atmosphere with a sense of security and belonging.	.894		
	CM16: Create harmony and a relationship of mutual assistance between parents and teachers.	.870		
	CM17: Provide parents with opportunities to get to know one another to promote classroom relationships.	.768		

Note. [a] Because of the factor loading was no more than .7, the original items BI12, BI13, PI2, PI4, PI9, CM1, CM10, CM11, CM12, and CM13 were deleted, and then all items were rearranged.

Data Analysis

The computer programmes used for data analysis and processing were SPSS, Version 20.0 and Analysis of Moment Structures (AMOS), Version 17.02. The tests comprised reliability analysis, descriptive statistics analysis, and structural equation modelling (SEM). According to Little (2013), SEM is primarily a latent-variable approach. A number of measured indicators are used to represent and estimate scores through an underlying construct (i.e., latent variable). Because latent variables are not observed directly, it follows that they cannot be measured directly. Thus, the researcher must operationally define the latent variable of interest in terms of behaviour believed to represent it. As such, the unobserved variable is linked to observable variables that are observable, thereby making its measurement possible (Byrne, 2012). Moreover, in order to make sure a good overall fit of structural model, this study utilised SEM to test the hypotheses as well as the goodness-of-fit index (GFI), adjusted goodness-of-fit index (AGFI), normal fit index (NFI), root mean square residual (RMR), and chi square ratio (χ^2/df) to evaluate overall model fitness.

Results

Correlations among the Measures

There are many ways to measure the degree of correlation among variables. We evaluated the correlations among four commonly used indicators: means, standard deviations, correlations, and

Cronbach's α coefficients. Moreover, Cohen (1988) suggested that a Pearson coefficient greater than .5 is high, whereas a coefficient of .5-.3 is moderate, and a coefficient .3-.1 is low. Table 4 shows the means, standard deviations, and correlations of BI, PI, and CM. BI and PI exhibited significant difference and highly positive correlations (r = .555, p < .001). Furthermore, significant difference and CM effectiveness showed highly positive correlations (r = .701, p < .001). Additionally, significant difference and highly positive correlations were evidenced between PI and CM effectiveness (r = .712, p < .001).

As evidenced by the analysis data shown in Table 5, the variables for the constructs (i.e., BI, PI, and CM) and three indicators (i.e., usefulness, ease of use, and perceived risk) all showed significant difference with positive effects.

Table 4 Means, standard deviations, correlations, and α coefficients (N = 382)

Variables	*M*	*SD*	BI	PI	CM
Behaviour intention (BI)	3.48	.75	(.930)		
Parental involvement (PI)	3.39	.68	.555***	(.871)	
Classroom management (CM)	3.58	.70	.701***	.712***	(.938)

Note. ***p < .001; Brackets indicates α coefficients.

Table 5 Inter-correlation among the behaviour intention, parental involvement, and classroom management (N = 382)

					BI		
		BI	PI	CM	Usefulness	Ease of use	Risk
BI	Usefulness	.936***	.563***	.676***			
	Ease of use	.933***	.571***	.714***	.854***		
	Risk	.554***	.134***	.253***	.311***	.343***	
PI		.555***					
CM		.701***	.712***				

Note. ***p < .001.

Hypotheses Test

The maximum likelihood programme AMOS, Version 17.02 was employed to test the theoretical model and confirm the hypothesised causal relationships among BI, PI, and CM. The goodness-of-fit statistics shown in Table 6 includes χ^2/df = 1.711 < 3, CFI = .9578 > .9, GFI = .926 > .9, AGFI = .900 = .9 (Acceptable), SRMR = .033 < .08, TLI (NNFI) = .972 > .9, RMSEA = .043 < .08, Hoelter's CN (.05) = 275 > 200. Therefore, the results of the structural parameter estimates and goodness-of-fitness indices met the standard.

The structural parameter estimates and goodness-of-fit indices in Table 6 show that using Line was positively associated with perceived CM effectiveness (γ_{bc} = .506, p < .001). Therefore, H_1 was supported. Kilgore (2010) has suggested that teachers in higher grade levels and those who used email communication frequently reported positive perceptions towards email communication with parents. Currently, Line is more frequently used than email, owing to its superior functionality. Therefore, Line can more efficiently facilitate CM effectiveness in enabling cooperation between teachers and parents.

Using Line was positively associated with PI, as shown in Table 6 (γ_{bp} = .578, p < .001). Therefore, H_2 was confirmed. Palts and Harro-Loit (2015) indicated that greater abundances of communicative strategies lead to greater PI effectiveness. Schools can take advantage of advancing technology to improve school-to-home communications and positively influence PI (Radin, 2013).

PI was positively associated with perceived CM effectiveness (γ_{pc} = .451, p < .001). $H_{3\text{-}1}$ was therefore supported. A teacher's level of classroom management was positively correlated with parental involvement ($H_{3\text{-}2}$: γ_{cp} = .729, p < .001). The result is also consistent with the finding of Akın et al. (2016). Castro et al. (2015) and Wilder (2014) have argued that PI can enhance student achievement and learning development. Thus, to improve students' achievements, enhancing the correlation between PI and CM effectiveness is crucial. Therefore, it was evident that PI plays a significant role in educational settings.

H_4 examined the direct and indirect effect among BI, PI and CM. As indicated in Table 7, the classroom management path coefficient employing BI was .809, whereas the t value was 16.281 (Step 1); the PI path coefficient employing BI was .703, whereas the t-value was 11.804 (Step 2). Employing BI and PI simultaneously as the predictor variables to analyse classroom management through the SEM, the PI path coefficient of class management was .451, and the t-value was 7.841 (Step 3) as also shown in Table 7.

Table 6 Results of the structural parameter estimates and goodness-of-fit indexes

Hypotheses	Paths	Standardised coefficients	*t*-value	Result
H_1	Behaviour intention→ Classroom management	.506***	8.996	Supported
H_2	Behaviour intention→ Parent involvement	.578***	9.555	Supported
H_{3-1}	Parent involvement→ Classroom management	.451***	7.841	Supported
H_{3-2}	Classroom management→ Parent involvement	.729***	8.039	Supported

Note. ***p < .001.

Moreover, the path coefficient of classroom management employing BI was .451, and the *t*-value was 7.841. The path coefficient is lower than the path coefficient (.809) in using the BI individually for classroom management (Step 4). Regarding the elements of the effect of mediation, the most common method for testing mediation was developed by Kenny and his colleagues (Baron & Kenny, 1986; Kenny, Kashy & Bolger, 1998). They proposed that an independent variable must have a significant impact on a dependent variable and a mediator. If an independent variable and a dependent variable are the predictor variables, a mediator must have a significant impact on a dependent variable. Then, the regression coefficient of an independent variable towards a dependent variable is lower than the regression coefficient of a dependent variable, which is individually predicted (Baron & Kenny, 1986; Kenny et al., 1998). Therefore, when we inserted a mediator (i.e., PI), the regression coefficient of classroom management using BI decreased from .809 to .451. However, the predicted values increased. Based on the analyses of Table 7, these prove that BI had an impact on classroom management through PI, which represented a partial mediating role. Therefore, H_4 was supported.

Furthermore, Wisethrinthong, Sirisuthi and Weangsamoot (2012) showed that classroom management and teaching are continual, reciprocal processes that enhance learning environments, allow greater interaction among parents, teachers, and students, enable a calm class atmosphere, prevent deviation of student behaviour, encourage children to learn, inspire cooperation between the parents and teachers, and enhance learning effectiveness among students.

Table 7 Testing mediator effects using Baron and Kenny's theories

Testing steps in mediation model	Equation (1)		Equation (2)		Equation (3)	
	Coefficients	*t*-value	Coefficients	*t*-value	Coefficients	*t*-value
Testing step 1						
BI→CM	.809***	16.281				
Testing step 2						
BI→PI			.703***	11.804		
Testing step 3						
PI→CM					.451***	7.841
Testing step 4						
					.451 < .809	

Note. *p < .05; **p < .01; ***p < .001.

As indicated in Figure 3, the teaching management component of teacher classroom management involving Line as a means of parent-teacher communication, regarding the perceived ease of use, revealed an effect size of .474 and a *t* value of 3.813 (p < .001) reach the levels; the cohesion management component of class management, evidenced an effect size of .549 and a *t* value of 4.219 (p < .001), reaching the standard. This indicated that the perceived effectiveness of teaching management and cohesion management increased with teacher perceived ease of use. Therefore, H_5 was confirmed.

The evidence and effect of the mediating role of parents are presented in Table 8 (Only significant indicator variables were shown). Two paths were confirmed. First, the path of "ease of use→ school education→ teaching management" was composited with a direct effective value of .474 and an indirect value of .203 (.525 x .387), with a total effect value of .677. Second, the path of 'ease of use→ school education→ cohesion management' was confirmed with an effective value of .549 and an indirect effective value of .178 (.525 x .339). The total effective value was up to .727. The two total effective values were greater than .5 and positive (Hsieh & Chu, 2013). Therefore, H_6 of this study was supported. According to Marshall and Jackman (2015), the current findings underscore the importance of PI, support its influence in children's academic success and foster strong school-parent partnerships.

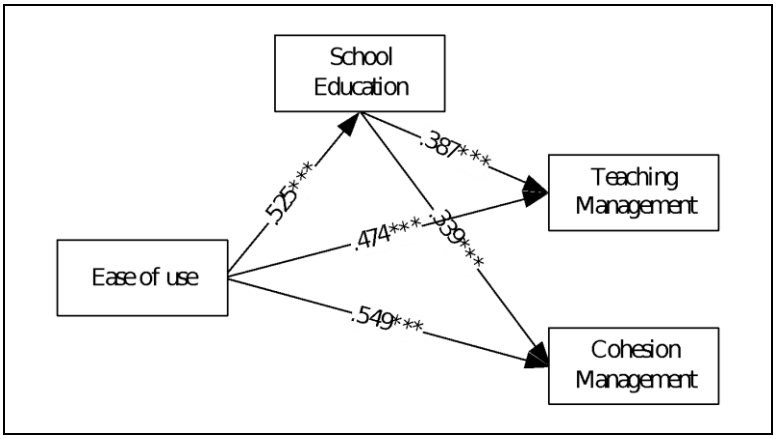

Figure 3 The analysis of indicator variables among BI, PI and CM

Table 8 Direct and indirect relationship

Paths	Direct effect	Indirect effect	Total effect
Ease of use→ School Education →Teaching Management	.474	.203	.677***
Ease of use→ School Education →Cohesion Management	.549	.178	.727***

Note. ***p < .001.

Feedback of the Focused Group Interviews

The focused group interview was conducted by a facilitator among one director and six teachers. The interview was executed in an organised way with research hypotheses where respondents are free to give views from any aspect (Greenbaum, 2000). In addition, statistical results were shown and discussed during the focused group interviews. The members of the focused group agreed that Line could be an asset for linking parents and teachers. In other words, Line can play a significant role to enhance Classroom Management effectiveness through parental involvement. However, despite that Line provides a convenient multiuser communication platform, a proportion of the teachers in the group was uncomfortable with using Line as a parent-teacher communication channel. Some teachers believed that it was inefficient, and raised concerns about personal privacy. Their concerns are as follows: (1) The quantity of Line messages could be excessive and complex. Therefore, the teachers cannot reply to each message individually. If the teachers ignore the messages, this could cause communication problems in the parent-teacher relationship (also refer to H_1); (2) line nicknames are not necessarily indicative of real names, which can lead to potential communication errors (also refer to H_1 and H_5); (3) although there is private communication function available on Line, some parents may not want their children's personal matters made public by teachers or other parents, particularly concerning negative behaviours (also refer to H_2). Thus, an app like Line is limited applicability; (4) not all parents know how to use Line. If the teachers heavily rely on using Line for communication, it can have a negative effect on parents who cannot join the Line group (also refer to H_3); (5) parents and teachers cannot always read the mobile phone messages in a timely manner and improvement in this regard is doubtful (also refer to H_4); (6) parent-teacher communication sometimes focuses on the children's behaviours. If communication occurs face-to-face, it is more effective than through text messages because the meaning of various words and phrases may be misunderstood (also refer to H_3); and (7) using Line may extend teachers' working time. Teachers could effectively be on call 24 hours a day, which would negatively influence teachers' abilities to work and teach (also refer to H_3 and H_6).

Conclusion

Limitation

Although this study yielded crucial results, it had certain notable limitations. First, the sampling district was limited to the primary school teachers in Changhua County, which may have reduced inferential reasoning, owing to the urban-rural gap and narrow scope of educational level. As urban, suburban, and rural school districts each have a unique set of characteristics and problems that may impact the degree of parental involvement (Prater, Bermúdez & Owens, 1997). Secondly, we could not confirm whether the sample participants used Line on-site to engage in parent-teacher communication, or whether the questions on the questionnaire accurately reflected performance. This affected the reliability and validity of this study. If future research could avoid these limitations, such as by sampling teachers across various cities and counties, expanding the scope of educational level to junior and senior high schools, and confirming

the use of Line on-site to engage in the parent-teacher communication, the reliability and the validity of the results should increase.

Theoretical Conclusion

H_1: Firstly, most teachers' continuous use of educational technology involved the evaluation of behavioural intention based on the above study. For the Line users, the most favourite functions are stickers, group, and messaging. Direct connection and ease of contact are the main reasons to let users keep using this app. The major comments and feelings on Line are on four key features: instant, convenience, emotion exchange, and fun (Hu, 2015). Therefore, BI of using Line can enhance CM effectiveness, and good classroom management of a teacher did also show positive association with parental involvement. However, as soon as the technology (referring here to networking apps) is in use, it will inevitably have an impact on its users beyond the intentions of the designer (Dorrestijn & Verbeek, 2013). After school communication may cause extra work for teachers. Therefore, using Line can be a supporting channel for parent-teacher communication, it can also become an inevitable burden to teachers.

H_2: Secondly, Line's constructs, facial expression stickers, clear communication, and image expression exhibit actual cause-and-effect relationships. This proves that "images" expression can increase people's emotion exchange and express the feeling precisely. This is also a reason why Line can successfully maintain its attractiveness (Hu, 2015). Thus, BI of using Line can encourage and facilitate PI. Certainly, PI may increase the understanding of schooling. Teachers can take advantage of advancing technology to improve school-to-home communications and positively influence PI (Radin, 2013). This result was consistent with the study, which indicated that different patterns enable teachers to apply various communication strategies to efficiently involve parents in the educational development of their children (Palts & Harro-Loit 2015). Therefore, the more communication channels and frequencies between teachers and parents, the more parents are involved in classroom management.

$H_{3\text{-}1}$/$H_{3\text{-}2}$: Thirdly, PI was positively associated with perceived CM effectiveness, moreover, CM effectiveness is positively associated with perceived PI. Akın et al. (2016) identified that the factors likely to cause classroom management problems were related to teacher and parents. Therefore, parent-teacher collaboration should be reinforced to support primary teachers in managing their classrooms. There is no doubt that a successful CM requires the cooperation between parents and teachers throughout the use of Line in this behaviour study. However, in complex situations involving students, face-to-face communication is sometimes more effective than communication through text messages.

H_4: Moreover, Yotyodying and Wild (2014) have argued that motivational beliefs might affect PI. Accordingly, the Line social networking app may encourage teachers and parents to use due to the fun sticker and easy to use the Line. Therefore, BI of using Line had an impact on classroom management through PI, which represented a partial mediating role. It is understood that parents play a key role in an effective CM particularly in the part of family education. In other words, PI can be an interface between teachers and students in terms of CM.

H_5: Furthermore, the effectiveness of teaching management and cohesion management increase with teachers perceived ease of using Line. The Line app user's core thinking can be classified as three main dimensions: usability needs, feeling and fun, and personality (Hu, 2015). Therefore, a friendly interface design of Line may encourage teachers to use the app for communicating with parents, and result in better CM effectiveness.

H_6: Finally, parental involvement in school education moderates the relationship between teachers' perception of ease of use of Line, as well as teaching and cohesion management in classroom management. In other words, enhancing classroom management through parental involvement by using social networking apps such as Line is possible. However, in conclusion, if teachers choose to employ Line to enhance classroom management, they should establish rules concerning its use in advance to minimise avoidable problems.

Overall Conclusion

We noticed that a primary school environment reflects the developmental trends of a society. The means employed by primary school teachers to communicate with parents not necessarily consist of just a single method. Teachers should initiate the use of any appropriate channels that can transmit information instantly and effectively, such as Line app, under the rules that agreed to by teachers and parents in advance. This study may influence primary school teachers to use Line as a convenient means of parent-teacher communication in addition to traditional communication channels. In the complicated modern school environment, parent-teacher communication must be carefully considered, because it can have a significant impact on student learning. For this reason, parents and teachers should remain receptive to improving their communication models either through traditional or modern technological means. Optimal parents-teachers communication method can be derived through mutual understanding and create a beneficial learning environment for children. Hence, an overarching conclusion can be syn-

thesised as follows: the research topic does inspire parents and teachers to be aware of the importance of modern technological literacy, which are often ignored by the users at a macro level. At a micro level, rules of using Line have to be set up for interaction between parents and teachers. Overall conclusions from this study suggested that teachers and parents must be aware of the side effect of using Line on classroom management. They should also adopt a proper reaction specific to a given situation, and consider one another's feelings. In summary, the researchers hope that social networking as a platform can be a component in supporting classroom management in the future. Through using rules concisely, it is possible that both parents and teachers will comprehend certain positive effects in using social networking apps. Nevertheless, Line on-site provides an access for publishing concrete information, rather than in-depth communication. Its graphical stickers may sometimes result in misunderstanding. Therefore, more alternate channel, such as direct, in-person talk may be necessary as the situation dictates. To enhance classroom management effectiveness, there is a need to balance traditional methods with modern technology.

Suggestions

In the current study, 15 primary schools and 382 teachers were chosen as research objects. However, if one can design a special version of parent questionnaires to understand the perceptions and attitudes of parents, the research results might reveal more features and enhance wider opinions. Furthermore, if the administration can provide support for the design of variables, this may exhibit a mediatory impact and become moderated mediatory variables of classroom management. This should allow the research framework as a whole to become more complete. Therefore, if future research could avoid the research limitations, such as sampling teachers across various cities and counties, expanding the scope of educational level to junior and senior high schools, and confirming the use of Line on-site to engage in the parent-teacher communication, the reliability as well as the validity of the results ought to increase. Nevertheless, this study proved the possibility of enhancing classroom management effectiveness through parental involvement by applying new technology. However, cultural differentiation ought to be taken into consideration when applying the research findings to different countries or regions. Therefore, as for Taiwan, which is evolving from an autocratic regime to a democracy, South Africa undoubtedly will face many transitions in different periods, and also accumulate new knowledge and experience in its educational system (Skinner, 2017). The educational paradigm gained in this study may also contribute to a more effective education system, which could prepare all participants towards becoming productive members of the emerging economy such as South Africa.

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Note

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