

## RELATIONSHIP BETWEEN ATTITUDE AND INTENTION TO USE INFORMATION COMMUNICATION TECHNOLOGY IN SELF-DIRECTED PROFESSIONAL DEVELOPMENT

Idawati Che Mat<sup>1</sup>, Hashin Mohammad<sup>2</sup>, Bahaman Abu Samah<sup>3</sup>

<sup>1</sup>Institut Pendidikan Guru Malaysia

<sup>2</sup>Institut Pendidikan Guru Malaysia

<sup>3</sup>Faculty of Educational Studies. Universiti Putra Malaysia

Accepted date: 15 April 2018

Published date: 23 September 2018

### To cite this document:

Mat. I. C, Mohammad. H, Samah. B. A. (2018). Relationship Between Attitude and Intention to Use Information Communication Technology in Self-Directed Professional Development. *Journal of Information System and Technology Management*, 3(9), 15-26.

---

**Abstract:** *The Malaysian government is very concerned about the Teachers Professional Development (TPD). Since Self-Directed Teacher Professional Development (SdTPD) is more appropriate for teachers personally to create their own professional development goals and take the necessary steps to achieve that goal (Marsick & Watkins, 2015; Gaible & Burns, 2005; Villegas-Reimers, 2003) so teachers are encouraged to use this model for their professional development. Today, the use of technology is very helpful in many areas including for SdTPD. However, its use is not very broad, there is a need to understand the attitude of the teacher regarding the use of Information Communication Technology (ICT) as SdTPD tools from the perspective of the Technology Acceptance Model. The purpose of this study is to further understand the attitude of teachers in using ICT as SdTPD tools. The model is based on the Technology Acceptance Model. The study aims to analyze the relationship between teacher's intention to use (ITU) ICT as SdTPD tools with two popular antecedents (perceived ease of use (PEOU) and perceived usefulness (PU)) and attitude (ATT). Through the survey method, a total of 524 teachers were selected to answer the questionnaire provided. Random sampling was used to make the selection of participants. All participants involved have given their consent during a briefing so that no ethical issues arise. The results show that teachers' attitude is an important predictor of teacher intentions to use ICT as SdTPD tools. Contributing to the intention to use ICT as SdTPD tools is the attitude of the teacher itself. The results of this study are expected to provide input to improve and guide the efforts to increase the use of ICT as SdTPD tools. Hopefully it will provide benefits according to the needs of teachers.*

**Keywords:** *Attitude; Intention to Use; Self-Directed Teacher Professional Development; Technology Acceptance Model*

---

## **Introduction**

Nowadays, the use of Information Communication Technology (ICT) is very thriving in various fields. The government has provided many infrastructures for the use of ICT especially for education. Therefore, professional development (PD) for teacher also involved in using ICT. For the implementation of self-directed teacher professional development (SdTPD), teachers need only to use the provided infrastructure. Hopefully the use of technology in teaching and learning is the most appropriate and wise decision made by the teacher to implement PD (Lawless and Pellegrino, 2007; Blanchard, LePrevost, Tolin and Gutierrez, 2016; Darling-Hammond, Hylar & Gardner, 2017). Transition in TPD is necessary to give teachers the impression and choice for self-development. SdTPD is very suitable for use now because there are various ways and networks that teachers can use during the information age. With the help of technology, supervision by the superior is easier to do. Discussions with colleagues are not as complicated as ever. Transmitting information or whatever material is just a click away. Therefore, the integration of technology in the education and perceptions of teachers, attitudes and intentions to use ICT in TPD has become very important to be judged (Ozdamli & Uzunboylu, 2014). To fill in the research gap, this study will explore the intention of the teacher to use ICT as SdTPD tools related to attitude based on the Technology Acceptance Model.

### *Problem Statement*

The Ministry of Education's has spent a lot on professional development programs for teachers. This is all done to improve the quality of teachers in hopes of improving student achievement in schools (Mizell, 2010; Moon, 2013; DeMonte, 2013). However, due to various constraints, many teachers can not engage in professional development. Most professional development programs do not meet actual teacher needs (Abdullah, Razak & Ghavifekr, 2017). Therefore, the government encourages teachers to be involved in self-directed in order for teachers to improve teaching quality according to their needs (MOE, 2013). Today, the use of technology is very helpful in many areas including for SdTPD (British Council, 2015). However, its use is not very broad, there is a need to understand the attitude of the teacher regarding the use of Information Communication Technology (ICT) as SdTPD tools from the perspective of the Technology Acceptance Model.

### *Literature review*

#### *TPD Common Models*

There is an excessive quantity of TPD models. After doing the research, the models can be arranged according to some of the main key characteristics. There are three general models of widespread TPD known as standardized TPD programs, school-centered TPD, and individual or self-directed TPD (Gable and Burns, 2005; Hooker, 2008). All the models mentioned have its own beneficial quality and limitations. Due to the unique elements inherent in each model, it is important to choose the type of TPD that suits the needs of the target group.

Most TPD programs run for teachers are included in the Standardized TPD (STDP) model group (Gaible and Burns, 2005). It usually involves speakers or facilitators delivering

new knowledge or specific teaching strategies to a large group of educators in the context of training sessions workshops, or conferences. With the proper implementation of this model it can give a good impression. The impact of STDP can be divided into three parts: 1) to introduce the latest concepts and procedures to teachers as well as to provide opportunities for teachers to collaborate with friends, 2) to distribute strategies and skills to teachers in designated areas, and 3) To clearly state a particular new or old policy. Often this approach is delivered by giving training to a group of educators selected. This group after completion of the training will return to their school and perform the same training. This exercise is carried out to achieve the target group. This approach is known as cascade model (Hayes, 2000; Gaible & Burns, 2005). Using this method, it has the potential to target large groups in a short time. In addition, it can utilize existing staff as trainees as well as reduce the use of financial resources (Nassazi, 2013; Gilpin, 1997). This is widely implemented by organizations that seek to implement massive changes. STPD has been criticized for not affecting the teaching strategy, but it is more than just the latest style. Among the criticisms include: 1) Workshops are conducted for one-time events only and have no effect on long-term (Ball & Cohen, 1999; Grossman, Wineburg, & Woolworth, 2001); 2) the program does not provide follow-up programs and implementation is weak (Gaible & Burns, 2005); 3) Expertise is only available at the initial stage of TPD. The more it moves downhill and the likelihood that the expertise is lost (Gilpin, 1997; Hayes, 2000); and (4) standardized training is not suitable for some schools as there are schools with their own needs (Gaible & Burns, 2005; Avalos, 2011). For successful STPD programs, especially those using the cascade model, the following conditions need to be met: 1) non-passive training and must be reflective and experiential; 2) the training must be contextualized so it is necessary to be flexible; 3) expert knowledge must be spread across all existing levels; 4) when developing materials for training, assessment of stakeholders must be made; and 5) division of tasks must be equal in the cascade levels (Hayes, 2000).

Promote communities of practice is the main focus of School-Centered TPD (Lave & Wenger, 1991; Elliott, 2012). ScTPD aims to use new teaching strategies or solve specific problems for this situation. ScTPD is usually a long-term solution, where its emphasis lies in mastery learning maintained by Bloom. Although ScTPD has many advantages, there are some things that are not good about it. The most important limitation in this model is time. Since ScTPD feels at certain times but requires a lot of energy for its supply then it is said to be worthless (Gaible & Burns, 2005; Hobson & Malderez, 2013). There are some schools in the area far from trained facilitators, so schools only use facilitators who have less expertise as needed. But if the school can provide ScTPD, it will certainly produce a new innovation in terms of strategy and practice of school administrators. ScTPD is said to be unique because it can be used as an extension or accountability measure to the STPD program (Gaible & Burns, page 22). For example, if a new teaching strategy has been introduced to a group of teachers, ScTPD can be used to create follow-up programs such as the complexity of the issues, the support of the facilitator in addressing local issues and the implementation of innovation.

SdTPD involves teachers personally to create their own professional development goals and take whatever steps are necessary to achieve that goal (Gaible & Burns, 2005; Villegas-Reimers, 2003; Chaghari, Saffari, Ebadi & Ameryoun, 2017). Due to the nature of individualized nature in SdTPD, teachers can choose their own way of learning, either taking university courses, attending workshops, or simply watching video samples. For some teachers, they are more comfortable with the advice of friends who have expertise in subject or self-directed classes taught by their expert peers (Gaible & Burns, 2005; Epstein & Willhite, 2017). The role of the administrator here is to guide, support, and provide feedback to get the planned objectives (Gaible & Burns, 2005; Villegas-Reimers, 2003). If we look at this model in terms

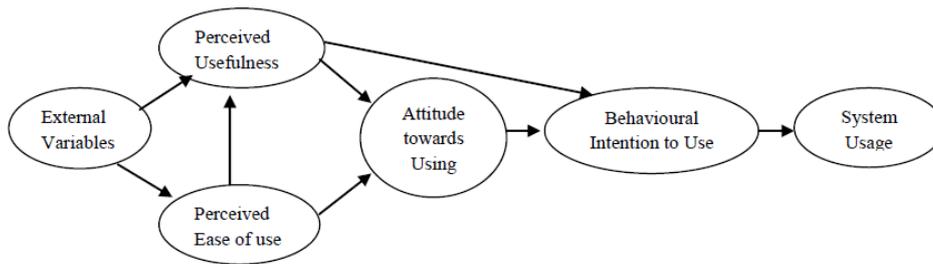
of the features available on the effective TPD then it clearly shows no relationship between the teacher and other colleagues or TPD providers. However, these shortcomings can be overcome by "tuning protocols". This strategy was created by David Allen and Joseph McDonald. Through this strategy the teacher will present the SdTPD idea and ask for constructive feedback from other colleagues (Easton, 1999). Due to the SdTPD 's assumption that teachers should be self-motivated to pursue their own development as educators, new teachers will face some problems. This is because most new teachers have basic teaching skills and have not mastered the content (Gaible & Burns, 2005). SdTPD is more suitable for senior teachers who are intrinsically motivated to sharpen and advance their skills (Fullan, 2014). SdTPD is also offered in addition to the form of STPD and ScTPD and not as a single source (Gaible & Burns, 2005).

### *ICT impact on professional development*

Professional environments have the potential to change to more effectively with the technology (Gaible and Burns, 2005; Josep, 2015). Teachers can collaborate with colleagues and make planning and research using computer and others technology devices (Nussbaum et al., 2009). In this way the teacher is able to improve the SdTPD. Impacts by technology not only in the teaching and learning process in the classroom (Hew and Brush, 2007; Voogt et al., 2017). But also, in the opportunities and ways the educators learn and improve themselves (Baylor and Ritchie, 2002; Harlen, 2017). Technology affects two important aspects of professional education development. First, how to train potential teachers (pre-service) (Teo et al., 2018) and the second is how to plan continuing professional development for existing teachers (in-service) (Russell, Bebell, O'Dwyer and O'Connor, 2003; Teo, 2015). Teacher training institutions produce new teachers at primary level. While the university produce new teachers at secondary level and provide masters or postgraduate training and has an active role in teacher professional development. Most members of the learning community are teachers. Teachers usually learn from colleagues (Turner et al., 2018). They exchange views and opinions in solving problems or other things that are necessary (Vangrieken et al., 2017). This is the way indirectly the teacher learns. However, job constraints cause regular sharing among teachers to be difficult (Day, 2002). Fortunately, the problem of maintaining cooperation between teachers can be reduced by the availability of technology (Mumtaz, 2000; Duffy & Gallagher, 2017). Various exercises for using technology have been provided. Some even learn in cyberspace (Woodard & Machado, 2017).

### *Technology Acceptance Model*

Theory Reason Action (TRA) is the basis of classical TAM. This model uses the system as a behavior and was proposed by Davis in 1985. The Technology Acceptance Model (TAM) proposed by Davis (1986) is well-known as one of the models relating to the adoption and acceptance of technology. The Subjective Norms (SN) as factor in TRA, has been neglected while Attitude (ATT) has been the main factor. Then two factors namely Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) are added as another main factors. Furthermore, the intention to use this technology is regarded as a function of attitudes and perceived usefulness towards the use of technology in TAM (Davis 1989, 1993; Davis et. al., 1989). The diagram figure 1 below shown the Technology Acceptance Model (TAM).

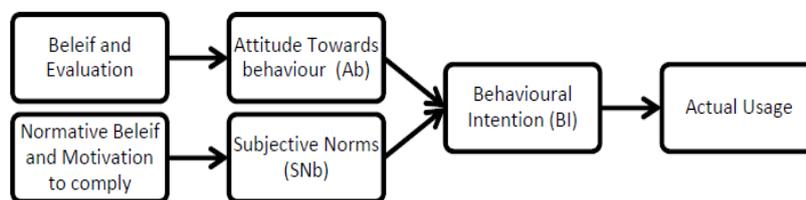


**Figure 1: Technology Acceptance Model (Davis et al., 1989)**

Extensive use of TAM by researchers to predict BI in using software such as tools for software development, business application and office automation (Legris et al., 2003). In addition to the use of technology in the organization, TAM is also applicable in the context of general use of technology (Davis et al., 1989). Additionally, TAM has been used in a variety of technologies such as email, voice mail, software and the World Wide Web (Wu & Chen, 2017; Venkatesh et al., 2003; Taylor & Todd, 1995a; Mathieson, 1991; Lederer et al., 2000; Adams et al., 1992; Davis et al., 1989). It is easier to predicting the intention with this model. (Agarwal & Prasad, 1999). In addition, TAM is relatively stable and robust and can be used for various technologies (Venkatesh & Davis, 2000). Empirical support was given in the last study. Similarly, substantial attention and support to the use of TAM models in various technologies and environments.

*Behavioural Intention to Use (ITU)*

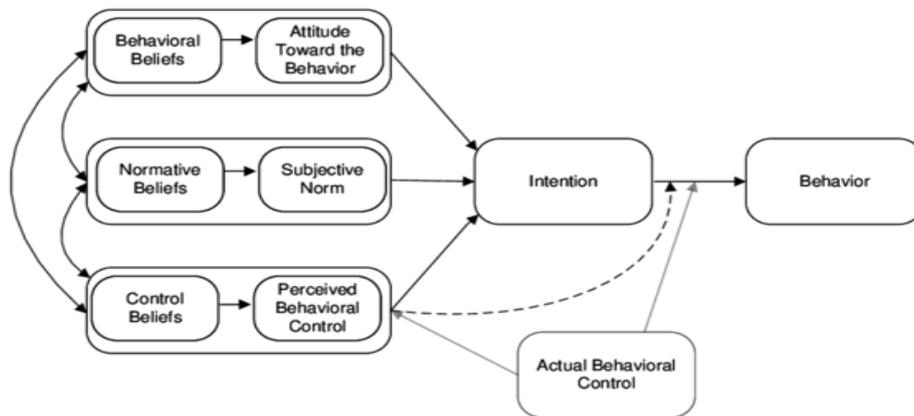
The closest predictor of the behaviour is intention (Ajzen, 2005; Shapiro & Carlson, 2017). Intention to use has been the focus of many previous studies as well as many researchers linking intent to use with the context of the study they have studied. Fishbein and Ajzen (1975) generally define intention to use as “the strength of one's intention to perform a specified behaviour”. In Theory Reasoned Action (TRA), Fishbein and Ajzen (1975) have begun to highlight ideas regarding behavioral intention to use. The diagram figure 2 below shown the TRA. TRA describes how behavioral intentions can be attributed to motivational factors that influence attitudes and how much effort a person will do for that behavior. The TRA model assigns behavioral intention as an antecedent to individual's performance and is a behavior that becomes the probability of generating more specific behavior. (Ajzen, 1985; Ajzen & Fishbein, 1980).



**Figure 2: The Theory of Reasoned Action (TRA)**

Theory Planned Behavior (TPB) is one of the examples based on intention-based model. This model views behavioural intention predicted by subjective norm, attitude and perceived behavioral control determines the intention of a individual's behavior. This model also suggests that immediate antecedent of behavior is intentions (Ajzen, 2002). In various domains, intention is said to be a predictor of behavior. This has been widely proven psychologically (Ajzen, 1991; Ajzen & Madden, 1986). Intention is also said to be a predictor

in the study which involves information systems, in particular to the use of technology. (e.g. Davis, Bagozzi, & Warshaw, 1989; Taylor & Todd, 1995; Venkatesh & Davis, 2000). Behavioral intention is the most suitable predictor to determine the actual use. This can be seen through the TAM and TRA models (Ajzen & Fishbein, 1980; Davis et al., 1989) which have also been recognized in many previous studies on this subject (e.g. Davis et al., 1989; Pedersen, 2005; Lu, Zhou, & Wang, 2009; Sek et al., 2010; Shih & Fang, 2004; Kim, Shin & Lee, 2009). The diagram figure 3 below shown the Theory Planned Behavior (TPB).



**Figure 3: Theory Planned Behavior (TPB)**

### *Attitude towards using ICT Tools*

Experts in the field of psychology recognize that social structure is important in maintaining the various components of society. But in their view, attitude must be changed first if you want to change behavior. (Dollard, 1949; Krech & Crutchfield, 1948; Kutner, Wilkins, & Yarrow, 1970; Lewin, 1999; Anable, Lane & Kelay, 2006; Clayton et al., 2015) In general, the attitude is referred to as an individual's evaluation of a particular behavior regardless of whether a positive evaluation or a negative evaluation. In technology, attitude refers to individual positive or negative evaluation of the use of technology. (Davis 1989; Davis et al., 1989). An individual who have a positive attitude towards behavior will be easier to have the intention to do that behavior (Ajzen, 1991). In a study conducted in Malaysia on the use of technology using TAM (Ahmed et al, 2011; Malathi and Rohani, 2011) found positive attitude and TAM constructs (PU and PEOU) had a significant effect on intention to use and attitude toward technology. However, most studies only focus on the students of higher education. Only a few studies involve the attitude of teachers for the use of their professional development.

### *Methodology*

This quantitative study uses a random sampling method on 524 teachers in Peninsular Malaysia. The survey was conducted using a questionnaire instrument to collect data. TAM constructs are used as references to generate questionnaire. This includes respondent's profile and perceptions on ICT as SdTPD tools such as ease of use, attitude, usefulness and intention to use ICT as SdTPD tools by using seven-point Likert scale measurement. Respondents were briefed before responding to the questionnaire. The briefing is intended to provide the basic information necessary only. The consent of the participants was also taken to ensure that this study did not violate the ethics that should be followed during the study period. The time given to answer the questionnaire is 15 minutes only. Data analysis is carried out using SPSS 22.0 including frequency, correlation and regression.

*Findings*

Based on respondents’ profiles in Table 1, frequency analysis was run. This is done to get the distribution of the respondents. In terms of gender, 66% of the respondents were female. This is more than half of respondents. In general, female teachers are more than male teachers. This is the reason why the percentage of female teachers is higher. Majority of the respondents were in the age group of 41-50 years (39.1%), followed by age group of 31-40 years (35.9%), age group of 51 years and above (14.9%) and the least was the age group of Less than 31 years (10.1%). Since the respondents are teachers in primary school, their current education was in diploma or degree level which accounts 69.1% for degree level and 21.8% for diploma level respectively. For Master Degree level is 8% and PhD level is 0.2%. In terms of their teaching experience, more than 20 years’ experience (26.9%), 16 – 20 years’ experience (20.4%), 11 – 15 years’ experience (20.2%), 5 – 10 years’ experience (22.5%) and less than 5 years (9.9%) .

**Table 1: The Respondents Profile**

Demographic Variables		Frequency	Percent
Gender	male	178	34.0
	female	346	66.0
age group	Less than 31 years	53	10.1
	31-40 years	188	35.9
	41-50 years	205	39.1
	51 years and above	78	14.9
Qualification	Cert	5	1.0
	Diploma	114	21.8
	Bachelor Degree	362	69.1
	Master Degree	42	8.0
	PhD	1	.2
teaching experience	Less than 5 years	52	9.9
	5 – 10 years	118	22.5
	11 – 15 years	106	20.2
	16 – 20 years	107	20.4
	More than 20 years	141	26.9

**Table 2: Pearson Correlations**

Correlations				
		PEOU	PU	ATT
ITU	Pearson Correlation	.507**	.292**	.650**
	Sig. (2-tailed)	.000	.000	.000
	N	524	524	524

\*\* . Correlation is significant at the 0.01 level (2-tailed).

The results show that every pairs of the variables are significantly correlated at the 0.01 level of significant.

**Table 3: Regression Analysis**

Coefficients <sup>a</sup>						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.319	.197		6.677	.000
	PEOU	.199	.025	.299	7.922	.000
	PU	-.022	.022	-.036	-.996	.320
	ATT	.604	.039	.537	15.320	.000

a. Dependent Variable: ITU

Let's focus on the three predictors, whether they are statistically significant and, if so, the direction of the relationship. The average perceived ease of use (PEOU,  $\beta=.199$ ) is significant ( $p = 0.000$ ). Next, the effect of perceived usefulness ( $\beta=-0.022$ ,  $p=.320$ ) seems to be unrelated to academic performance. This would seem to indicate that the percentage of ICT usefulness is not an important factor in predicting Intention to use -- this result was somewhat unexpected. Finally, the percentage of attitude (ATT,  $\beta=0.604$ ,  $p=.000$ ) is significant and its coefficient is indicating that the greater the proportion teachers' attitude, the greater the Intention to use. Please note that value of  $\beta =.604$ . The results indicate that they have a positive relationship with each other.

### *Discussion*

The findings of this study demonstrate that attitude plays a significant role in persuading the teachers' intention to use ICT as SdTPD tools. Many previous studies on attitude and intention to use ICT support this decision. Most of the studies agree that attitude is an important component of determining intention to use technology (Legris, Ingham and Collerette, 2003; Teo, 2011; Pynoo et al., 2012). It is found that positive attitudes are important to encourage one to learn anything (Gardner and Miller, 1999). Unpredictable result in this study is that when perceived usefulness were not significant predictors in influencing the intention to use ICT as SdTPD tools. This situation may be because teachers feel they are familiar and have knowledge of the ICT as SdTPD tools. Teachers feel that technology is not new for them even though they lack or do not use ICT as SdTPD tools.

### *Conclusion*

In conclusion, attitude become the most significant one followed by perception of ease of use, and the perception of usefulness not so important. By understanding the strong predictors of teachers' intention to use ICT as SdTPD tools it can help teachers to provide the appropriate program for the successful use of ICT as SdTPD tools. It is important for teachers to ensure ICT as SdTPD tools are beneficial and successful.

### **References**

- Abdullah, S. N. A. S. B., Razak, A. Z. A., & Ghavifekr, S. (2017). Relationship Between Teachers' in-Service Training and Teaching Professionalism: Suitability Aspects. *Mojem: Malaysian Online Journal of Educational Management*, 4(2), 51-63.
- Ahmed, T.S., Kamal, M.B., Nik Suryani, A. and Tunku, B.T.A. 'Investigating students' attitude and intention to use social software in higher institution of learning in Malaysia', *Multicultural Education and Technology Journal*, Vol. 5, No. 3, 2011. pp.194–208
- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50(2), 179e211.
- Ajzen, I. (2002). Perceived behavioral control, self-efficacy, locus of control, and the theory of planned behavior. *Journal of applied social psychology*, 32(4), 665-683.
- Ajzen, I., & Fishbein, M. (1980). *Understanding attitudes and predicting social behaviour*. Prentice Hall PTR.
- Ajzen, I., & Madden, T. J. (1986). Prediction of goal-directed behavior-attitudes, intentions, and perceived behavioral-control. *Journal of experimental social psychology*, 22(5), 453-474.
- Anable, J., Lane, B., & Kelay, T. (2006). An evidence base review of public attitudes to climate change and transport behaviour. *The Department*.

- Avalos, B. (2011). Teacher professional development in teaching and teacher education over ten years. *Teaching and teacher education*, 27(1), 10-20.
- Baylor, A. L., & Ritchie, D. (2002). What factors facilitate teacher skill, teacher morale, and perceived student learning in technology-using classrooms? *Computers & education*, 39(4), 395-414.
- Blanchard, M. R., LePrevost, C. E., Tolin, A. D., & Gutierrez, K. S. (2016). Investigating technology-enhanced teacher professional development in rural, high-poverty middle schools. *Educational researcher*, 45(3), 207-220.
- British Council (2015) *Technology for professional development: access, interest and opportunity for teachers of English in South Asia*. British Council: New Delhi.
- Chaghari, M., Saffari, M., Ebadi, A., & Ameryoun, A. (2017). Empowering education: A new model for in-service training of nursing staff. *Journal Of Advances In Medical Education & Professionalism*, 5(1), 26.
- Clayton, S., Devine-Wright, P., Stern, P. C., Whitmarsh, L., Carrico, A., Steg, L., ... & Bonnes, M. (2015). Psychological research and global climate change. *Nature Climate Change*, 5(7), 640.
- Conway, J. A., & Calzi, F. (1996). The Dark Side of Shared Decision Making. *Educational Leadership*, 53(4), 45-49.
- Darling-Hammond, L., Hyster, M. E., Gardner, M. (2017). *Effective Teacher Professional Development (research brief)*. Palo Alto, CA: Learning Policy Institute.
- Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1989). User acceptance of computer technology: a comparison of two theoretical models. *Management science*, 35(8), 982-1003.
- Davis, F.D. (1986). *A Technology Acceptance Model for Empirically Testing New End-User Information Systems: Theory and Results*, Doctoral dissertation, Sloan School of Management, Massachusetts Institute of Technology.
- Day, C. (2002). *Developing teachers: The challenges of lifelong learning*. Routledge.
- DeMonte, J. (2013). *High-Quality Professional Development for Teachers: Supporting Teacher Training to Improve Student Learning*. Center for American Progress.
- Dollard, J. (1949). Under what conditions do opinions predict behavior? *Public Opinion Quarterly*, 12(4), 623-632.
- Duffy, G., & Gallagher, T. (2017). Shared education in contested spaces: How collaborative networks improve communities and schools. *Journal of Educational Change*, 18(1), 107-134.
- Easton, L. B. (1999). Tuning protocols. *Journal of Staff Development*, 20(3), 54-55.
- Elliott, J. (Ed.). (2012). *Reconstructing teacher education* (Vol. 221). Routledge.
- Epstein, A., & Willhite, G. L. (2017). Teacher efficacy in an early childhood professional development school. *International Electronic Journal of Elementary Education*, 7(2), 189-198.
- Fishbein, M., & Ajzen, I. (1975). *Belief, attitude, intention and behavior: An introduction to theory and research*. Reading, Mass: Addison-Wesley Pub. Co.
- Fullan, M. (2014). *Teacher development and educational change*. Routledge.
- Gaible, E., & Burns, M. (2005). *Using Technology to Train Teachers: Appropriate Uses of ICT for Teacher Professional Development in Developing Countries*. Washington, DC: infoDev / World Bank.
- Gaible, E., & Burns, M. (2005). Using Technology to Train Teachers: Appropriate Uses of ICT for Teacher Professional Development in Developing Countries. *Online Submission*.
- Gardner, D., & Miller, L. (1999). Establishing self-access: From theory to practice. *Cambridge University Press*.

- Gilpin, A. (1997). Cascade Training: Sustainability or Dilution. In McGrath, I. (Ed.), *Learning to Train: Perspectives on the Development of Language Teacher Trainers*. (pp. 185 - 195). Prentice Hall Europe.
- Guskey, T. (2011) Evaluation: Critical to professional development. *Principal Matters*, 87(1), 44-48.
- Harlen, W. (2017). *The Teaching of Science in Primary Schools*. David Fulton Publishers.
- Hayes, D. (2000). Cascade training and teachers' professional development. *ELT Journal*, 54(2), 135-145
- Hew, K. F., & Brush, T. (2007). Integrating technology into K-12 teaching and learning: Current knowledge gaps and recommendations for future research. *Educational technology research and development*, 55(3), 223-252.
- Hobson, A. J., & Malderez, A. (2013). Judgementoring and other threats to realizing the potential of school-based mentoring in teacher education. *International journal of mentoring and coaching in education*, 2(2), 89-108.
- Holloway, J. H. (2000). Research link: Preparing teachers for differentiated instruction. *Educational Leadership*, 58(1), 82-83.
- Hooker, M. (2008). Models and best practices in teacher professional development. *GeSCI*. Retrieved from [http://www.gesci.org/old/files/docman/Teacher\\_Professional\\_Development\\_Models.Pdf](http://www.gesci.org/old/files/docman/Teacher_Professional_Development_Models.Pdf)
- Josep M. (2015). *The implications of technological change on the teaching profession Background paper for discussion at the 12th Session of the CEART* (Paris, 20–24 April 2015) Paris:UNESCO.
- Kim, G., Shin, B., & Lee, H. G. (2009). Understanding dynamics between initial trust and usage intentions of mobile banking. *Information Systems Journal*, 19(3), 283-311.
- Krech, D., & Crutchfield, R. S. (1948). *Theory and problems of social psychology*. New York: McGraw-Hill Book Company, Inc.
- Kutner, B., Wilkins, C., & Yarrow, P. R. (1970). Verbal attitudes and overt behavior involving racial prejudice. In G. F. Summers (Ed.), *Attitude measurement* (pp. 433-437). Chicago: Rand McNally & Co.
- Lawless, K. A., & Pellegrino, J. W. (2007). Professional development in integrating technology into teaching and learning: Knowns, unknowns, and ways to pursue better questions and answers. *Review of educational research*, 77(4), 575-614.
- Legris, P., Ingham, J., & Colletette, P. (2003). Why do people use information technology? A critical review of the technology acceptance model. *Information & management*, 40(3), 191-204.
- Lewin, K. (1948). *Resolving social conflicts*. New York: Harper & Row, Publishers
- Lu, Y., Zhou, T., & Wang, B. (2009). Exploring Chinese users' acceptance of instant messaging using the theory of planned behavior, the technology acceptance model, and the flow theory. *Computers in human behavior*, 25(1), 29-39.
- Malathi, L. and Rohani, T. (2011). 'Assessing the intention to use e-book among engineering undergraduates in Universiti Putra Malaysia, Malaysia', *Library Hi Tech*, Vol. 29, No. 3, pp.512–528.
- Malaysia. Ministry of Education (MOE). (2013). *Malaysia Education Blueprint 2013-2025*. Retrieved from [https://www.moe.gov.my/images/dasar-kpm/articlefile\\_file\\_003108.pdf](https://www.moe.gov.my/images/dasar-kpm/articlefile_file_003108.pdf)
- Marsick, V., & Watkins, K. (2015). *Informal and Incidental Learning in the Workplace* (Routledge Revivals). Routledge.
- Mizell, H. (2010). *Why Professional Development Matters*. Learning Forward. 504 South Locust Street, Oxford, OH 45056.
- Moon, J. A. (2013). *Reflection in learning and professional development: Theory and practice*. Routledge.

- Mumtaz, S. (2000). Factors affecting teachers' use of information and communications technology: a review of the literature. *Journal of information technology for teacher education*, 9(3), 319-342.
- Nassazi, A. (2013). Effects of Training on Employee Performance: Evidence from Uganda.
- Nussbaum, M., Alvarez, C., McFarlane, A., Gomez, F., Claro, S., & Radovic, D. (2009). Technology as small group face-to-face Collaborative Scaffolding. *Computers & Education*, 52(1), 147-153.
- Pedersen, P. E. (2005). Adoption of mobile Internet services: An exploratory study of mobile commerce early adopters. *Journal of organizational computing and electronic commerce*, 15(3), 203-222.
- Pynoo, B., Tondeur, J., Van Braak, J., Duyck, W., Sijnave, B., & Duyck, P. (2012). Teachers' acceptance and use of an educational portal. *Computers & Education*, 58(4), 1308-1317.
- Russell, M., Bebell, D., O'Dwyer, L., & O'Connor, K. (2003). Examining teacher technology use: Implications for preservice and inservice teacher preparation. *Journal of teacher Education*, 54(4), 297-310.
- Sek, Y. W., Lau, S. H., Teoh, K. K., Law, C. Y., & Parumo, S. B. (2010). Prediction of user acceptance and adoption of smart phone for learning with technology acceptance model. *Journal of Applied Sciences (Faisalabad)*, 10(20), 2395-2402.
- Shapiro, S. L., & Carlson, L. E. (2017). *The art and science of mindfulness: Integrating mindfulness into psychology and the helping professions*. American Psychological Association.
- Shih, Y. Y., & Fang, K. (2004). The use of a decomposed theory of planned behavior to study Internet banking in Taiwan. *Internet research*, 14(3), 213-223.
- Taylor, S., & Todd, P. A. (1995). Understanding information technology usage: A test of competing models. *Information systems research*, 6(2), 144-176.
- Teo, T. (2011). Factors influencing teachers' intention to use technology: Model development and test. *Computers & Education*, 57(4), 2432-2440.
- Teo, T. (2015). Comparing pre-service and in-service teachers' acceptance of technology: Assessment of measurement invariance and latent mean differences. *Computers & Education*, 83, 22-31.
- Teo, T., Sang, G., Mei, B., & Hoi, C. K. W. (2018). *Investigating pre-service teachers' acceptance of Web 2.0 technologies in their future teaching: a Chinese perspective*. *Interactive Learning Environments*, 1-17.
- Turner, J. C., Christensen, A., Kackar-Cam, H. Z., Fulmer, S. M., & Trucano, M. (2018). The development of professional learning communities and their teacher leaders: An activity systems analysis. *Journal of the Learning Sciences*, 27(1), 49-88.
- Vangrieken, K., Meredith, C., Packer, T., & Kyndt, E. (2017). Teacher communities as a context for professional development: A systematic review. *Teaching and Teacher Education*, 61, 47-59.
- Venkatesh, V., & Davis, F. D. (2000). A theoretical extension of the technology acceptance model: Four longitudinal field studies. *Management science*, 46(2), 186-204.
- Villegas-Reimers, E. (2003). Teacher professional development: an international review of the literature production. *Paris, France: International Institute for Educational Planning*. Retrieved at [http://www.iiep.unesco.org/fileadmin/user\\_upload/Research\\_Challenges\\_and\\_Trends/133010e.pdf](http://www.iiep.unesco.org/fileadmin/user_upload/Research_Challenges_and_Trends/133010e.pdf).
- Voogt, J., Knezek, G., Christensen, R., Lai, K. W., Pratt, K., Albion, P., ... & Resta, P. (2017, March). The International Handbook of Information Technology in Primary and Secondary Education: Part 2. In Society for Information Technology & Teacher

- Education International Conference (pp. 1082-1085). *Association for the Advancement of Computing in Education (AACE)*.
- Woodard, R., & Machado, E. (2017). Using video in urban elementary professional development to support digital media arts integration. *Journal of Digital Learning in Teacher Education*, 33(2), 49-57.
- Wu, B., & Chen, X. (2017). Continuance intention to use MOOCs: Integrating the technology acceptance model (TAM) and task technology fit (TTF) model. *Computers in Human Behavior*, 67, 221-232.