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The Influence of Mobile Phones on the Efficiency of Mobile Professional Learning Communities in the Maldivian Schools

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Abstract: In the light of Unified Theory of Acceptance and Use of Technology (UTAUT), and Professional Learning Models, educational leaders are challenged to rethink and redesign the adaption of mobile technologies in the teaching and learning processes in schools. The study examined the integration of mobile phones in to the continuous professional learning communities (PLC). The determinant factors of mobile phone applications and their influences on the efficiency of mobile professional learning communities were investigated with a semi-structured questionnaire retorted by 450 Maldivian teachers. The result depicted the indispensable role of mobile phones in navigating individual and professional learning communities (PLC) through Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI), and Facilitating Conditions (FC) of the mobile phone applications. The research may contribute to the theories especially in the ground of mobile-professional learning communities with concrete evidence to extend the theories with relevance to the fast pace development across the globe. The study would also contribute novelty to the education system by offering support to the Maldivian National Educational framework in designing mobile learning communities (m-PLC) with mobile media intervened education. The study focused on a unique aspect of PLC and mobile phones to constructed an integrated m-PLC framework which is an under researched area especially in the context of developing countries such as Maldives.

Key Words **- Professional Learning Communities; Mobile Professional Learning Communities; Virtual Professional Learning Communities; Education; Maldives**

Introduction

The last decade has witnessed a revolutionary social change with the swift technological advancements and the flooding of digital devices such as smart mobile phones and tablets (Almaiah et al., 2022). The lives of youth as well as adults are immersed in the digital arena where the daily routing activities and day-to-day communications are widely interconnected through the digital stratagems (Almaiah et al., 2019). As a notion to delve in the realms of ideal, the organizations and institutions too are steamrolling the facilities and services (Binyamin & Zafar, 2021). However, the schools in Maldives still seem to be scratching the surface with limited adoption of technological aids used in learning, and the use of mobile phones in classrooms too seem to be sentenced to prejudice (Fikuree et al., 2021). The resistance to mobile learning in classrooms reveals that the teachers are unaccustomed to the modern diplomacies and fail to keep pace with the growing trend of using mobile phones for educational purposes (Fikuree et al., 2021). This behavior hints towards the cry need for the training of teachers for the educational use of mobile phones.

With regard to the training and development of teachers, there is growing literature advocating for the importance of academic networks such as professional learning communities in the collective learning of teachers (Johannesson, 2022; Kin & Kareem, 2021). However, this concept is still evolving itself with the recent trend showing extension towards mobile learning (m-learning) where the learners can access to educational materials and get assistance from anywhere at any time, using mobile and internet technologies (Lutfi et al., 2022). The mobility of these devices makes it considerably convenient as it opens opportunities for collaborative learning, knowledge sharing, development of academic communities, and immediate communications within fractions of seconds (Lai et al., 2022).

In the light of the theoretical underpinnings, the study intends to explore the influence of mobile phone applications on the efficiency mobile-professional learning communities (m-PLC) and propose a relevant framework for teachers, in the context of Maldives as a developing country. Specific objectives include;

- Examine the influence of Performance Expectancy of mobile phone applications on the efficiency of Mobile-Professional Learning Communities in Maldivian schools.
- Investigate the influence of Effort Expectancy of mobile phone applications on the efficiency of Mobile-Professional Learning Communities in Maldivian schools.
- Examine the influence of Social Influence of mobile phone applications on the efficiency of Mobile-Professional Learning Communities in Maldivian schools.
- Understand the influence of Facilitating Conditions of mobile phone applications on the efficiency of Mobile-Professional Learning Communities in Maldivian schools.

As educational institutions are making rapid strides through digital technologies, the in-depth insight provided by the current research on the motivation, communication, collaboration and self-regulated development that could be brought through the mobile academic networks (m-PLCs) become substantially important to the policy makers and educational leaders in transforming professional development of teachers. It is also hoped that the theoretical framework will contribute to the conceptualizing and structuring of theories which could bring a revolution to the teaching practices. The study becomes important to Maldives considering the geographical isolation and socioeconomic challenges.

I. LITERATURE REVIEW

e-learning to m-learning

Electronic learning or e-learning has taken up the institutions and organizations for the past decade (Mastan et al., 2022). The debates on the benefits, acceptance and adoption were well in discussion even in the developing countries (Kin & Kareem, 2021). The concept of electronic learning was in debate with various new terms such as distance learning, ICT integrated learning, online learning, virtual learning, etc. under the umbrella (Mastan et al., 2022). Applications of digital tools such as lecture recordings, questioning tools, classroom response systems, virtual classrooms came as boundless assistance to teachers in their learning and teaching (Kin & Kareem, 2021).

Amongst the many lessons taught by the current outbreak, COVID-19 brought the importance of independent learning or self-directed learning (Lai et al., 2022). The pandemic situation disturbed the lives of people with numerous restrictions such as physical distance, lockdown of offices and schools, lockdown of countries, travel restrictions etc. (Camilleri & Camilleri, 2022). These change in norms brought a paradigm shift towards the to the social lives and to the educational practices as well (Alturki & Aldraiweesh, 2022). These stark contrasts from social constructivist theory which necessitates social interaction for active learning, intuitive decision making or organizational engagement to occur (Kritt & Budwig, 2022). Hence, the technology-based learning had become more ubiquitous than ever, more importantly in education sector.

Teachers stroked this commotion at large scale as their work and their development demand lots of collaboration and team work (Althunibat et al., 202). In an age where educationalists are broadly employing continuous training and development as professional learning communities, the disconnect from these academic networks hugely impacted their learning (Almaiah et al., 2022). Hence, this phase witnessed mobile-learning or remote- learning rating itself amongst the most commanded form of learning where the learners were reached whether in quarantine, isolation, or in any part of the world, in no time (Camilleri & Camilleri, 2022). Though, remote learning has been in use for decades, the critical phase of pandemic emphasized it as a major opportunity to bring a new-fangled trend in teaching and learning (Lai et al., 2022).

Today youth as well as adults are increasingly using mobile phones for learning and for daily routine work too (Alghazi et al., 2021). They are using interactive media for searching of information, connecting with people, and to acquire formal and informal skills (Almaiah & Mulhem, 2019). According to Althunibat et al., (2021) mobile learning makes learning remote, easy and could literally hold all information in the phones and keep it in the pockets wherever they go.

Mobile Professional Learning Community (m-PLC)

Professional learning communities bring together teachers to discuss matters related to their teaching and learn together as a team (Johannesson, 2022). PLCs have been favored by several theories and research models (Johannesson, 2022; Kin & Kareem, 2021). According to social constructivist theory acquiring of knowledge or human learning and development is socially situated and is constructed through interaction with others (Ulukutuk, 2022). Lomas & Lin (2022), shed light on the functioning of human mind and explained the theory of experience which necessitated the dynamic collaboration and mental experience of the human society. However, with the new demands, the online learning environment are required to be designed to cater for the challenges of interactive and collaborative learning (Butler et al., 2021). Hands on, authentic, and creative approaches are required to develop critical thinking and combined effort in sorting out information and learning together (Zhou, 2022).

Even though the digital technology is expensive and providing adequate number of computers and other related digital infrastructure to all staff and teachers could be challenging for institutions (Alowayr & Al-Azawei, 2021). However, installing appropriate applications and proving internet to their personal mobile phones could be an effective alternative solution with an impactful result (Althunibat et al., 2021). Mobile phones are modern tools which fulfills the requirements of the restricted and unpredictable social cultures (Alghazi et al., 2021). Mobile phones allow access to recorded podcasts, watch videos, share pictures and information, analyze other's work, provide and get instant feedback, or interact with peers, facilitators, or experts at different parts of the world in real time (Binyamin & Zafar, 2021). Mobile phones offer learners with opportunities and platforms for virtual meetings, video conferencing, group discussions, group calls, one- to-one discussion, sharing of presentations or class notes at their convenient time and place (Butler et al., 2021). This way mobile phones allow learners to practice all the features acknowledged in professional learning community models; shared learning, shared leadership, shared values, collective responsibility, caring relationship etc. (Kruse & Louis, 1993; Kin & Kareem, 2021; Hence, the mobile phones have become the recent tools which connect the professional learning communities thus creating mobile- professional learning communities (m-PLC).

UTAUT Model and Formulation of Research Hypotheses

In order to examine the influence of mobile phones usage on the efficiency on professional learning communities in the schools in Maldives, the research employed Unified Theory of Acceptance and Use of Technology (UTAUT) as a theoretical model (Alghazi et al., 2021). The model is broadly exploited in education sector to comprehend the user intentions and usage behavior of teachers on various e-learning tools (Mastan et al., 2021). It is also used to discover the impact factors related to the acceptance of such systems to decide on the rationality of the model or system (Rentrop et al., 2022). Several researchers have validated this model in relation to educational technology researches but mostly student related systems were explored and considered student's viewpoints (Alghazi et al., 2021; Rentrop et al., 2022). The UTAUT model comprised of Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI), and Facilitating Conditions (FC) (Mastan et al., 2021). However, this study attempts to understand the impact factors of mobile applications on the efficiency of professional learning communities aimed for their training and development.

According to Al-Rahmi et al. (2020), if learners' expectation on the system to assist them in improving their performance as teachers are met, they consider the system useful. The famous Technology Acceptance Model (TAM) had similar viewpoint performance expectancy but termed this factor as perceived usefulness (Oyman et al., 2022). According to him perceived usefulness influences positively on their attitude towards the system and the intention to use it increases (Oyman et al., 2022). The intention and attitude of learners are critical to engage them actively in the learning process because using the mobile technology is completely up to the user (Tiwari, 2022). For instance, teachers frequently use recorded podcasts if they find it useful for their teaching (Zhou, 2022). A similar argument was put forward by researchers advocating PLCs and stated that the psychological conditions of teachers positively influence their intention to use the systems and thus strongly reflected the efficiency of PLCs (Kin & Kareem, 2021). Thus, hypothesis 3 aimed to discover how much the performance expectancy on mobile phone applications could impact the efficiency and adoption of PLCs in Maldivian schools.

H1: Performance Expectancy of mobile phone applications have significant influence on the efficiency of Mobile-Professional Learning Communities in Maldivian schools.

Tiwari (2022), believed that the technical complexity is a withdrawing factor which creates resistance for learner usage. Previous studies have rightly confirmed effort expectancy or perceived ease of use as a predictor of the acceptance m-learning models (Fussell & Truong, 2022). Zhou (2022), stated that user find m-learning systems useful only if the applications are handy and does not occupy much of their time. Researchers also found that users are hesitant to get involved in complex systems that required high level of skills or critical thinking (Lutfi et al., 2022). The famous TAM or Technology Acceptance Model also argued on the same note on this factor and declared the ease of use as a strong deciding factor on the adoption, acceptance, and usage frequency of m-learning systems (Oyman, 2022).

H2: Effort Expectancy of mobile phone applications have positive influence on the efficiency of Mobile-Professional Learning Communities in Maldivian schools.

According to Ulukutuk (2022), social influence is dependent on the available opportunity for interaction and resources. As such the interactivity brings richness to media by allowing easy flow of information between the three most important form of communication in a learning process; human-to-human, human-to-document, and human-to-system (Butler et al., 2021). The affluence for interactivity is a great contributor in the concept of professional learning community as well (Johannesson, 2022). According to Kin and Kareem (2021), learning is most efficient when it occurs in a collaborative manner by discussing and sharing knowledge with others. A traditional PLC model by Kruse and Luise (1993) argued that collaboration, idea sharing, open dialogue, and shared accountability are some of the components which make learning more meaningful. A more recent PLC model by Mahimuan (2018), projected 5 factors towards an efficient PLC; shared values, collective responsibility, shared learning, shared leadership, and caring relationship. Hence, it would be worth exploring how these factors of PLC get stimulated by the social influence features of mobile phone applications.

H3: Social Influence of mobile phone applications have significant influence on the efficiency of Mobile-Professional Learning Communities in Maldivian schools.

Facilitating condition is another determinant of technology acceptance which has put forward technological infrastructure, and environmental factors, as some facilitating conditions that stimulates the user attitudes towards the learning systems and improves the efficiency of learning (Tiwari, 2022). Lai et al., (2022), regarded intangible factors such as training and development, and technical and organizational support as equally important factors of user behavior and their engagement. Oyman et al. (2022), has explained this with the example of management support where he believed that the support from management decides on their willingness to provide the necessary resources and applications to the phones and thus project itself as a real indicator for the efficiency of the system. Institutional culture is another facilitating condition stressed as researchers believed that culture plays a crucial role in making the teachers comfortable with the new systems (Zhou, 2022). Rentrop et al. (2022), highlighted the lack of awareness of teachers as the failure of several systems. Hence, technical training also become a vital factor for the acceptance of learning models (Tiwari, 2022). These structural and cultural facilitating conditions were found in alignment with the school conditions attached to the efficiency of PLCs, too (Kin & Kareem, 2021). Hence, the fourth hypothesis intends to study the influence of facilitating conditions on the efficiency of m-PLCs in the Maldivian schools.

H4: Facilitating Conditions of mobile phone applications have a significant influence on the efficiency of Mobile-Professional Learning Communities in Maldivian schools.

Theoretical framework

The items of the UTAUT model have been adapted from the research presented by Alghazi et al., (2022), and the mobile-professional learning community was referred from the PLC model by Kruse and Louis, (1993). The figure 1 illustrates the conceptual framework formulated from the theoretical grounds and the hypotheses developed.

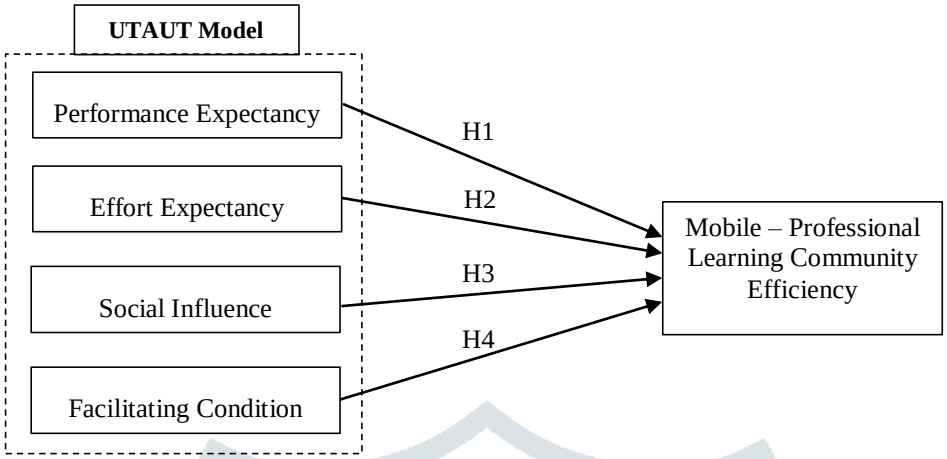

Figure 1: The conceptual framework adapted from Alghazi et al., (2022) and Kruse and Louis (1993)

II. RESEARCH METHODOLOGY

Population and Sample

A quantitative research approach was used for the study. The sample comprised of 450 teachers from randomly chosen from the primary and secondary schools in the Maldives. The schools were from varying socioeconomic status areas in Maldives. Data was collected through a semi-structured questionnaire with two sections and 27 questions used as a research instrument. The first section was the demographic section which held 5 questions whereas the second questions consisted of 22 questions to examine the Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI), and Facilitating Condition (FC), and the mobile learning practices as m-PLCs. The items of the questionnaire were adapted from Alghazi et al., (2022) and Kruse & Louis (1993).

III. RESULT ANALYSIS

Demographic Profile

Based on the analysis of demographic profile 53.3% were female and the remaining 46.7% were male, weighing a little towards the female. The percentage of teachers who owned smart phones was 95.1% which means majority of the respondents have their own mobile devices. Those who have internet access to the phones from school was 91.1% which is sensible after the huge investment by Maldivian education ministry towards digitalization of schools (Ministry of Education, 2019). Those who have internet access at home was found to be 87.6% which means a decent percentage of teachers had access to mobile media which is a positive sign for the current study. Amongst the most frequently used mobile applications were Facebook (42.7%), Viber (21.1%), Google (18.2%), WhatsApp (9.4%), and email (8.5%). Hence, the result showed that Facebook and Viber are the most famously used mobile application by teachers. The statistical treatment of the data was analyzed using structural equation modeling through the SPSS package.

Descriptive Statistics

The analysis of the data comprised of the analysis and interpretation of the data which began with the descriptive analysis. The descriptive analysis yielded high positive mean values ranging from 3.41 to 3.91 indicating towards the usefulness of the research construct (Main & Slater, 2022). The standard deviation ranged from 0.799 to 1.02 indicating towards a normal distribution of data with a spread of three standard deviations across the mean values (Babbie et al., 2022). The values for skewness and kurtosis fell between ±1.96 with a range from -0.340 to -0.68 for skewness and -0.22 to -4.89 indicating towards a normally distributed data (Babbie et al., 2022).

Assessment of Measurement Model

The initial measurement model was checked for the goodness of fit. The model was improved by removing a total of three items and drawing covariations between items. The final measurement model had good fit indices values of RMSEA 0.061 (absolute fit), CFI 0.954 (increment fit), and Chisq/df of 2.660 (parsimonious fit) thus confirming construct validity (Zainudin, 2012). The measurement model was then treated for internal consistency reliability, convergent and discriminant validity and the result is displayed in table 1 below.

Table.1: Summary of Reliability and Validity Assessment

	α ≥ 0.70	CR ≥ 0.70	AVE ≥ 0.50	PE	EE	SI	FC
PE	0.850	0.851	0.60	**0.785**			
EE	0.848	0.857	0.60	0.142	**0.776**		
SI	0.801	0.820	0.61	0.112	0.766	**0.78**	
FC	0.872	0.843	0.63	0.083	0.756	0.648	**0.842**

Internal consistency was evaluated by measuring the composite reliability (CR) and Cronbach's alpha (α) where the values for all the constructs were higher than the threshold values (α ⩾ 0.7; CR ⩾ 0.7) confirming internal consistency (Hair & Brunsveld, 2019). Convergent validity was approved with values of standardized factor loading higher than 0.6 and that of Average Variance Extracted (AVE) above 0.5 (Zainudin, 2012). The discriminant validity was also supported as the correlation coefficients were smaller than the square root of AVE for all pairs of constructs, as shown in table.1 (Zainudin, 2012). The discriminant validity was further confirmed as the covariance between all the constructs were found below 0.85 (Hair et al., 2019). The table.2 shows a summary of validity and reliability demonstrates, the measurement model was found, valid and reliable to run the structural equation model.

Table.2: Summary Table of Validity & Reliability

Validity & Reliability	Threshold	Remarks
Construct Validity	RMSEA <0.08, CFI > 0.9 and Chisq/df < 5.0	Achieved
Composite Reliability	CR > 0.6	Achieved
Convergent Validity	AVE > 0.5	Achieved
Discriminant Validity	Discriminant Validity Index Summary	Achieved

Assessment of Structural Model

The figure.2 below, depicts the structural equation model developed from the research findings to display the causal relationship between the constructs; Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI), Facilitating Conditions (FC) and mobile-PLC (m-PLC).

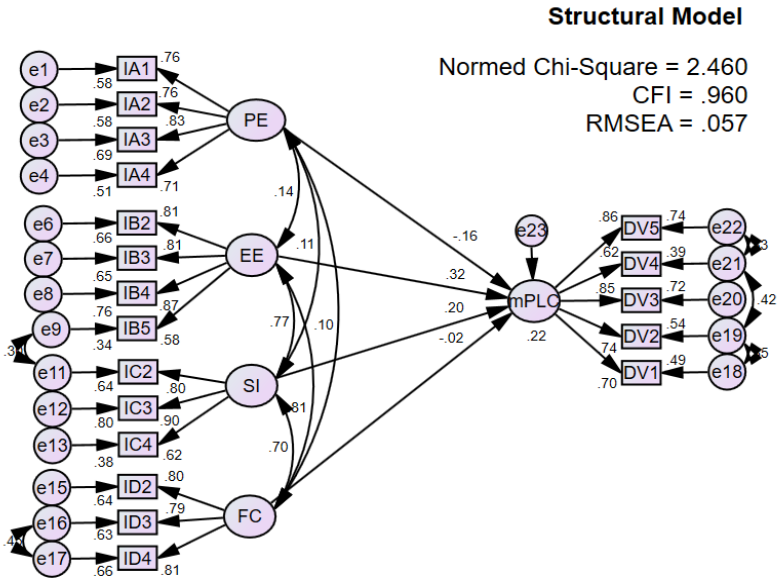

Figure 1: Structural Equation Model

As illustrated by the figure and the table.3, the model was statistically accepted as a good fitting model with the all the fit indices values within the cut off values of CMIN/df below 5, CFI above 0.95, and RMSEA below 0.08 (Zainudin, 2012).

Table.3: Construct Validity of SEM

Construct Validity	Name of Category	Name of Index	Level of Acceptance	Index Value	Remark
	Absolute Fit	RMSEA	< 0.08	0.057	Achieved
	Incremental Fit	CFI	> 0.9	0.960	Achieved
	Parsimonious Fit	Chisq/df	< 5.0	2.460	Achieved

The final structural equation model with five variables and 19 items was assessed for hypotheses though path (β) coefficients, and the corresponding levels of significance (p-values).

Table.4: Regression Weights Assessing the Hypotheses

Path of hypotheses	Estimate	S.E.	C.R.	P-value	Results
mPLC <--- PE	-0.174	0.162	-2.550	0.011	Accepted
mPLC <--- EE	0.413	0.056	3.105	0.002	Accepted
mPLC <--- SI	0.205	0.096	2.144	0.032	Accepted
mPLC <--- FC	-0.016	0.087	-0.187	0.852	Rejected

The table 4 displays the relationship amongst the constructs of the research model. Effort Expectancy ($\beta = 0.413$, $p < 0.002$) showed a reasonably strong and positive influence on m-PLC accepting hypothesis 1. The Performance Expectancy ($\beta = -0.174$, $p < 0.01$), and Social Influence ($\beta = 0.21$, $p < 0.03$) had weak but positive association with m-PLC. Thus hypotheses 2 and 3 were also supported. However, Facilitating Condition ($\beta = 0.027$, $p < 0.852$) had no effect on m-PLC with insignificant p-value and thus rejected hypothesis 4. All the values for the critical ratio were higher than 1.96 except for FC. The standardized estimate of Beta was -0.16(PE), 0.32 (EE), 0.20 (SI), and -0.02 (FC) indicating that all the three contextual factors have positive effect on virtual PLCs. The overall model revealed that 22% variance of m-PLC is accounted by Performance Expectancy, Effort Expectancy, Social Influence, and Facilitating Condition of the mobile applications. A summary of the hypotheses analysis is represented in the table.5 below.

Table 5: Summary of Hypothesis Testing

	Hypotheses	Significance	Relationship	Reference / Justification	Finding
H1	Performance Expectancy of mobile phone applications have significant influence on the efficiency of Mobile-Professional Learning Communities in Maldivian schools	Significant	Weak, negative	Table.5	Supported
H2	Effort Expectancy of mobile phone applications have significant influence on the efficiency of Mobile-Professional Learning Communities in Maldivian schools	Significant	Reasonably Strong, positive	Table.5	Supported
H3	Social Influence of mobile phone applications have significant influence on the efficiency of Mobile-Professional Learning Communities in Maldivian schools	Significant	Weak, positive	Table.5	Supported
H4	Facilitating Condition of mobile phone applications have significant influence on the efficiency of Mobile-Professional Learning Communities in Maldivian schools	Significant	No Effect	Table.5	Rejected

IV. DISCUSSION AND CONCLUSION

Despite the positive trend and remarkable use of mobile phones, their application in educational institutions is still limited. The research intended to investigate the impact of mobile phones and the determinants of mobile phone applications on the efficiency of m-PLC. The research studied teachers' perspectives with five constructs to identify the context-specific determinants of mobile phone application in Maldivian schools. Amongst the four dimensions, only three; Performance Expectancy, Effort Expectancy, and Social Influence showed associations with m-PLC and thus hypotheses 1, 2, and 3 were supported by the findings. However, the 4th hypothesis was rejected as the variable, Facilitating Condition had no significant impact on m-PLC.

Effort Expectancy (EE) showed the strongest positive influence (β = 41.3) on m-PLC which means the belief on the effort required for the mobile learning would stimulate their attitude and intention to use the applications. Hence, Effort Expectancy is depicted as a powerful tool to design, implement and sustain mobile learning networks (m-PLC) in schools. The findings were in alignment with the famously adopted Technology Acceptance Model (TAM) where sturdy declaration was made on the association of the ease of use of technology applications and the positive attitude and the intention to use them (Toraman, 2022). According to the model learner's expect easy and simple applications that are relevant to their subject and compatible for their requirements (Toraman, 2022).

Performance Expectancy (PE) had a significant (β = -0.174) yet a negative impact on m-PLC thus contradicting with the Bandura's (1995) self-efficacy theory which enlightened that the belief or expectation of personal achievement of the ability to attain success through an activity or application would positively influence the learners' attitude and intention for usage (Ion et al., 2022). The findings were also opposing with that of Fullan's (2007) change theory and the PLC model by Hall and Hord (2015) where they described that the beliefs or expectations decides the way of thinking and the mindset which ultimately creates a positive culture and motivates the engagement of learners (White-Jeffries, 2022). Cho & Cho (2018) had put forward an interesting argument with regard to self-regulated learning where they claimed that the method for setting the expectations should also be considered to understand the emotional impact on the engagement for uncertain outcomes. The researchers remain equivocal on whether the expectation was lowered under avoidance motivated anticipation or expectation was raised based on the approach motivation could emotionally impact the current engagement and behavior in the learning activity (Cho & Cho, 2018). Hence, this variable requires an in-depth analysis for a more comprehend understanding on the relationship.

Social Influence (SI) was also found a critical factor for mobile-PLC with (β = 0.21). This means that the teachers who participated in the study believed that social influence can affect their learning through mobile phones (m-PLC). The social constructivist theory also agreed to this finding where it considered the interaction with the community as a pivotal factor for meaningful learning to occur (Koegst, 2022). The PLC model by Hall and Hord (1993) also advocated for a collaborative culture to embrace and sustain professional learning communities (Koegst, 2022). All the five factors of the PLC model proposed by Mahimuang, (2018); shared value, shared leadership, shared learning, collective responsibility, and caring relationship, indicated with similar logic, towards social interaction and influence on individual learning. The model has given the highest weightage on caring relationship which only highlighted on the importance of connections and bonds between learners to withstand an efficient PLC.

The fourth variable, Facilitating Condition (FC) was surprisingly found insignificant for mobile learning (m-PLC) which was inconsistent with the previous researches on physical conditions, psychosocial conditions or climate condition required to facilitate PLCs in schools (Ismail, 2022). Lenart-Gansiniec et al. (2022), stated proper infrastructure, lack of knowledge, inadequate support from the management, the lack of trust and attrition of teachers, negative teacher attitudes lack of ample time as some of the barriers for the successful implementation of PLCs in different countries. Another research stated on the importance of modern mobile applications and software such as Microsoft team, google drive, or video conferring application, for information dissemination and sharing of tactic knowledge (Sadiq, 2019). Hence, the Facilitating Condition (FC) requires further investigation with more specific dimensions to describe this variable.

From a theoretical standpoint, learning is a cycle developed as a sequential process which may involve several intertwined layers or levels which requires continuous interaction and overlapping (Lenart-Gansiniec, 2022). Hence, the figure.3 below displays an integrated model which combines the dimensions of PLC model by Mahimuang (2018), with the components of the UTAUT mobile application acceptance model approved by the current research findings.

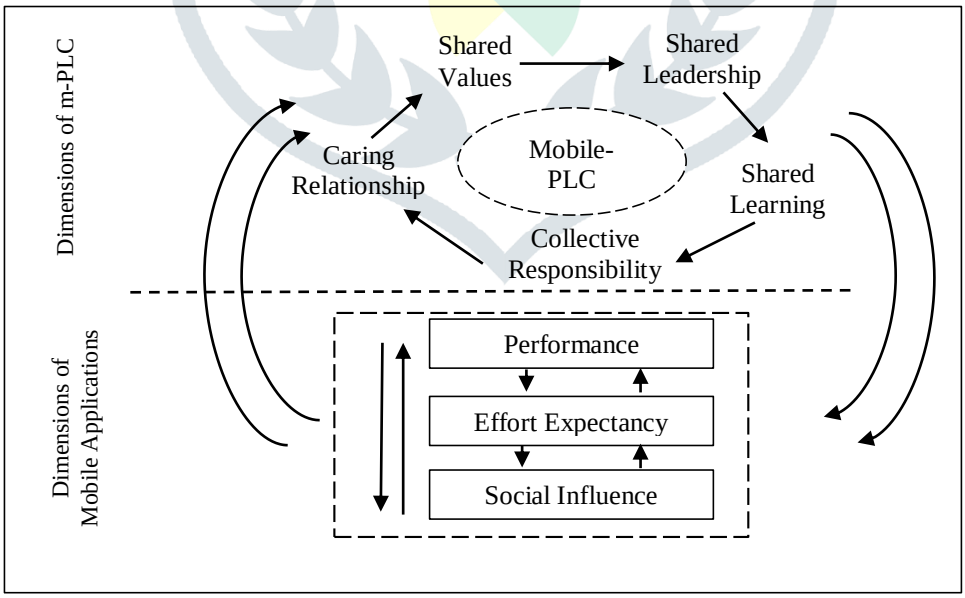

Figure 2: Integrated Model: the m-PLC Circle

From a theoretical standpoint, learning is a cycle developed as a sequential process which may involve several intertwined layers or levels which requires continuous interaction and overlapping (Lenart-Gansiniec, 2022). Hence, the figure.3 below displays an integrated model which combines the dimensions of PLC model by Mahimuang (2018), with the components of the UTAUT mobile application acceptance model approved by the current research findings.

Theoretical Implications

The result of the current research proposes several theoretical inferences. It encompassed new factors and dimensions relevant to mobile learning and m-PLC, especially in the context of geographically isolated areas such as Maldives. The research validated that the concept of PLC may be extended and merged with mobile technology to create a vibrant learning environment. It further complimented previous researches on the user perceptions on the dimensions for mobile application efficiencies and which makes the model adaptive and appropriate.

To this end, the impact of mobile learning and mobile technology integration has been under studied in literature, especially in the context of Maldives. Hence, this study becomes a pioneering effort to explore the integration of mobile technology and PLC which fill the gaps in literature and propose an extension of PLC to propose mobile-PLC. Hence, the framework proposed by the research could be the new mainstream learning model in the future. The research could be the base for researchers to extend and explore other dimensions or factors related to mobile-PLCs. Besides, the verbiage of the study could be adapted in other research contexts or populations

Managerial Implications

The research would be a preliminary step that encapsulated the critical factors and drivers of mobile technology acceptance and their influence on the establishment of mobile-professional learning communities. A robust and decisive understanding would offer practical implications to policy makers, educational leaders, practitioners, system developers, service providers, and academic researchers on designing and implementing quality mobile-professional learning community policies and systems in schools. It may also assist the principals in restructuring the school system for professional development of teachers to reassure collective decision-making and foster collaboration. A clear description of determinants of mobile technology guides the system providers to cater for the needs of teachers when developing their professional development programs. Further, the guidelines may assist the school administrators in revamping requirements in alignment with the mobile-PLC policies and programs. In a holistic aspect, the m-PLC framework could guide the teachers to use the mobile phones in a productive and creative ways rather than getting the attention diverted and preoccupied in the gaming and entertainment world only.

Conclusion

The study examined the impact of mobile phone applications and their influence on the efficiency of mobile-PLC in Maldivian schools. The study revealed that mobile-PLC will be a powerful auxiliary learning network which are significantly influenced by the performance expectation, effort expectancy, social influence, and facilitating conditions of mobile phone applications. The study had several theoretical and practical contributions to the field of education, especially in the context of Maldives.

Limitations and Recommendations for Future Researches

Indubitably, the study provided information about m-PLC, it had several limitations too. The study examined the five variables performance expectancy, effort expectancy, social influence, and facilitating conditions but was unable to uncover all the determinants influencing the acceptance of mobile technology and m-PLC. Besides, the findings on performance expectation only partly explained it's role on mobile applications. The findings were inconsistent with the previous studies on facilitating condition and their role in collaborative learning. Thus, further exploration is required to elaborate the core underlying factors with regard to these two variables and m-PLC. Hence, it calls for further researchers to tap on other determinants perceived with regard to learning through mobile phones and cross validate the model. The study design was also limited to the quantitative survey but the future researches may adopt mixed method so that the qualitative approach could also be considered to understand in-depth reasonings and viewpoints of teachers. It would also be more meaningful to include the opinions of system developers and practitioners through selective sampling. The model was studied only in the context of education and teachers but widening the scope to other industries could make the model more comprehensive. As the current study was a cross-sectional study, a longitudinal approach could shed light on a long-term association between the factors. Further examination of the model with moderating factors such as gender, age, experience could also add value to the model.

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