Influential factors of university teachers' lifelong learning in professional development

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This study was designed to investigate factors that influence university teachers' lifelong learning from the perspective of professional development. This study built a framework on Jarvis' lifelong learning definition which is rooted in the constructivist paradigm, indicating that adult lifelong learning is a process constantly constructed and reconstructed along with individual experiences with external organizational conditions.

The nature of the research questions directed the research design towards a quantitative approach. Samples were full-time teachers working in seven universities located in Shandong Province, China. Significant positive relationships of variables demonstrated Organizational Learning Culture (OLC), Managerial Effectiveness (ME), Learning Content Focus (LCF), Collaborative Learning (CL) and Psychological Empowerment (PE) as influential factors. And PE acted as mediator between OLC, ME, LCF and LLL.

This study provided a new perspective in promoting university teachers' lifelong learning. Empirical evidence and practical suggestions proposed in this study would be of great significance for higher education administrators.

Keywords: *Influential factors, lifelong learning. University teachers, professional development, adult learning*

Introduction

In the context of the knowledge economy and high-skilled labour demand, employability acts as an educational process that supports the transition from university to work (ICF GHK and Cedefop, 2014). As Purdue (2003) noted, "The constant and ever-quickening pace of change in the world today dictates that practicing professionals engage in a process of lifelong learning" (p.615). The term "lifelong learning" serves to explain that learning is not confined to childhood or the classroom, but takes place throughout life and in a range of situations (Fullan, 2011).

In this study, university teachers' lifelong learning was considered embedded in professional development. University teachers' lifelong learning (LLL) and professional development (PD) are kept in an interactively sustainable relationship. Given the point that adults learn more productively when they share responsibility for the learning process by actively participating in the operation of the experience (Knowles, 1975), teachers' experience is a concurrent activity along with their professional development. Teachers' learning in professional development, therefore, is typical of workplace learning, meeting the key defining criteria that participation in workplace and learning are seen as inextricably linked within the same process (Huisman, De Boer, Dill, SoutoOtero, 2015). University teachers need to be lifelong learners themselves in order to shoulder the heavy responsibilities entrusted to them and be capable of positively influencing students in their thoughts, behaviors and lifestyle (Shuming Gu, 2001). "

Kennedy (2010) pointed out the need to understand situational factors that impact teacher's practices. Combining factors influencing LLL, workplace learning and characteristics of effective PD, this study was defined to investigate the topic of contextual factors that influence

university teachers' pursuit of LLL along with their PD. Thus, the problems addressed in this study were:

1) What are the factors that were influencing university teachers' **lifelong learning in professional development?**

2) What are the relationships that existed between independent **variables and dependent variables?**

This study used an explanatory model. Factors of each dimension consist of university teachers' pursuit of LLL, psychological empowerment (PE) and organizational learning contexts, including organisation learning culture (OLC), managerial effectiveness (ME), learning content focus (LCF), and collaborative learning (CL). Based on Jarvis' lifelong learning definition that is rooted in the constructivist paradigm, the research model set pursuit of LLL as a dependent variable, OLC, ME, LCF and CL as independent ones, and PE as mediator.

This study would offer significant theoretical and practical implications. By identifying these factors, university administrators may glean more valuable information regarding the influential factors have on creating a lifelong learning culture. Knowledge gained from the study may generate **interest in conducting additional studies about individual attitudes,** motivation, and behaviors toward education, training, and professional growth. More empirical evidence on further understanding of university teachers' lifelong learning, psychological status and learning contexts would be provided. Results obtained in this study may help university administrators in building lifelong learning systems, planning future training and management of professional development, all of which would surely enrich the practical exploration in a related field.

Literature Review

The approach of lifelong learning (LLL), has gained currency through attempts to harness it as a means of providing people with the knowledge and skills they need to succeed in a rapidly changing world. Scholars and trend forecasters, looking towards the needs of the 21st century, have reached a nearly unanimous agreement about the importance of a constantly improving and technologically competent workforce that can compete in global markets (McCombs, 1991).

Realising the magnitude and importance of the challenge, policymakers,

politicians, and educators have made high-quality professional development opportunities for teachers a priority in modern educational reform proposals (Fishman, Marx, Best, & Tal, 2003). University administrators and policymakers are calling for "high quality" professional learning experiences for teachers and are making professional development "a key ingredient in the improvement of teacher instruction and student achievement" (Bassett, 2006, p.3).

Teachers are at the heart of the educational process, **and teaching is** viewed as a "professional" career. Professional development is essential for the continued development of teacher research, discovery, and critical thinking (China) National Staff Development Council [NSDC], 2006). Professional development enabled teachers to increase their sense of self-efficacy (Avalos, 2011) and increased their ability to teach students effectively (Vescio et al., 2008).

There are considerable gaps in the literature concerned with adult learning or lifelong learning. One such gap is the lack of tendency to focus on adult learning with professional development in specific fields. The literature revealed that researches on adult learning mainly focused on its andragogy theory, characteristics of adult learners, or evolving definitions and connotations. And similarly, in lifelong learning, characteristics of lifelong learners, its theoretical basis and objectives (mainly community learners after retirement) drew the interest of most researchers. The literature on university management, by and large, laid very little attention to managing the provision of teachers' professional development from the perspective of learning.

Characteristics of Lifelong Learning (LLL)

This study built a theoretical framework on Jarvis' (2006, 2007, 2008) constructivist perspective where learners construct meaning based on prior learning and can be classified as experiential learning. Thus, lifelong learning is defined as:

"The combination of processes whereby the whole person experiences … social situations, the perceived content of which is then transformed cognitively, emotively or practically… and integrated into the individual person's biography resulting in a constantly changing (or more experienced) person" (Jarvis, 2006, p. 134).

Knowles' (1984) principles about adult learners embodied effective lifelong learners as those who "are independent learners" and "self-directed", "are ready to learn whenever required" and "interactive with learning environment", "know the why and how they learn best", "own knowledge-transfer ability in various circumstances" (Knowles, 1984, p.49).

Pursuit of Lifelong Learning (LLL)

In exploring principal components to become effective lifelong learners, Carr and Claxton (2002) shared Knowles' (1975) assumptions and asserted that lifelong learning educators should attend to two inter-related facets of learning, capabilities and dispositions. Capabilities refer to the able aspect, and dispositions point to volition. In 2004, **Crick, Broadfoot, and Claxton constructed an assessment instrument** called Evaluating Lifelong Learning Inventory (ELLI) to identify the **components of lifelong learning and to assess an individual's lifelong** orientation. The ELLI consists of seven subscales and 72 items: "Changing and Learning", "Critical Curiosity", "Meaning Making", "Dependence and Fragility", "Creativity", "Learning Relationships" and "Strategic Awareness". Four assessment purposes of the ELLI incorporated self-reflection, self-direction, pedagogical adjustments, and learning style identification (Crick & Yu, 2008).

Characteristics of effective professional development (PD)

Recent research shows that one significant outcome of high-quality **professional development has been a shift in focus from earlier conceptions of professional development as something that is done** to teachers, to a new paradigm of professional development where teachers are active participants in their professional growth and learning (Huisman, De Boer, Dill, SoutoOtero, 2015). Recent research reflects **a consensus about the core characteristics of effective professional** development.

Learning Content Focus (LCF)

A broad meaning of the content for teachers' professional development, includes both teaching knowledge and teaching skills of subjects, which are described as "instructional content knowledge" and "pedagogical content knowledge" respectively. Given the "scholar" role of university

teachers' professionalism, university teachers' professional promotion system laid much importance on scientific research achievement (Zhang, 2006). The scientific research ability requires university teachers to have both professional academic competencies and auxiliary abilities such as **computer application, foreign languages and team coordination and so on** in this information era (Fang, Wu, 2017).

"**The evidence accumulated over the past decade points to the strong** link between activities that focus on subject matter content and how students best learn with increases in teacher knowledge, skills, improvements in practice, and student achievement" (Desimone, 2009, p. 184). Teachers with high pedagogical content knowledge "understand how to effectively match specific teaching approaches with the details of **their academic discipline, understand common student misconceptions, and are able to connect the essential concepts of their discipline to the** world of the learner" (Johnson & Marx, 2009).

Collaborative Learning (CL)

Coenders, 2010, Opfer & Pedder (2013) argued that teachers shape their own professional growth through active learning, reflection, and participation in practice and professional development programs. Researchers have found that professional development is the most useful and most effective when it actively engages teachers in learning and provides multiple opportunities for hands-on work that builds their understanding of academic content and how to best teach it to their students (Baniflower et al., 2005; Buczynski & Hansen, 2009; Coenders, 2010). Active learning can take at least four distinct forms: the opportunity to observe teaching, to practice new approaches, to examine and review student work (Johnson & Marx, 2009) and to develop presentations, lead discussions and produce written work (Ingvarson et al., 2005).

Research on effective professional development emphasises the importance of collaborative learning environments among teachers. Darling-Hammond et al.(2009) reported that teachers' increased collaborative activities can improve the information flow within the community of teachers, having developed a sense of community and trust among the faculty, and can also enhance teachers' job satisfaction and reduce staff turnover (Avalos, 2011; Cherkowski & Ragoonaden, 2016). Thus, university teachers' learning experiences occur both in

active learning as individual and collaborative participation as members in the learning environment.

Furthermore, active learning is a more complex and interconnected process. **Professional development derives from one common-shared environment,** and forms of active learning can't occur without interconnections with other coworkers, all of which falls in the range of active learning for individuals and collective participation in teaching groups.

Influential factors of workplace learning

Diverse variables in the work environment are likely to influence the learning of individuals, groups, and organisations. The environmental context may be crucial as it creates both opportunities and expectations (Badley, 2008; Heinemann et al., 2013).

Psychological Empowerment (PE)

Psychological empowerment is essentially related to learning in the workplace. It is described as "the connection between a sense of personal competence, a desire for, and a willingness to take action in the public domain" (Spreitzer, 2007, p.725). Psychological empowerment is defined as intrinsic task motivation in which individuals feel a sense of control about their work, including meaning, competence (self-efficacy), self-determination, and impact (Spreitzer, 1995, 2007). Four dimensions of psychological empowerment are related to learning activities in the workplace (Spreitzer, 1995, p.1443): "Meaning" is closely linked with value fulfilment and satisfaction at work; "Competence (self-efficacy)" is related to intrinsic motivation; "Self-determination" enhances individuals' motivation to learn and work; and "Impact" is about the initiative to engage in behaviors to influence desired outcomes.

Furthermore, except for the theory-building of psychological empowerment, most studies focused on its mediating effects. Sunyoung Park (2011) found that psychological empowerment and workplace learning had the strongest relationship, and organizational learning culture had more impact on psychological empowerment. Psychological Empowerment relates positively to affective states including job satisfaction and organizational commitment (Cicolini, Comparcini, & Simonetti, 2014) and is linked to lower rates of turnover intention and job-related strain (Spreitzer, 2007).

Organisation Learning Culture (OLC)

A corporate culture conducive to learning is one of the contextual factors affecting the probability that learning will occur in organizations and has played a critical role in fostering inquiry, openness, and trust in the workplace (Doornbos, Bolhuis, & Denessen, 2004). Marsick and Watkins (1990, 2003) suggested a framework for organizational learning culture through seven dimensions of the learning organization: "continuous learning", "inquiry/dialogue", "team learning", "embedded system", "empowerment", "system connection", and "strategic leadership", which provided a theoretical base that integrates the seven dimensions based on their interdependent relationships, as well as the primary concepts and definitions of the learning organization culture (Egan et al., 2004).

Critical elements to create organizational cultures include access to knowledge and information for learning, opportunities to practice skills for learning, the availability of support and feedback for learning, and the availability of rewards sustaining learning within the organizational structure (Ashton, 2004a).

Managerial Effectiveness (ME)

There is little doubt that school leaders can have a significant influence on teachers' capacity to enact professional learning and it is essential that school leaders must support, encourage, and recognize teachers when they take the initiative to engage in professional learning (Park, Choi, 2016). Leaders are described as "transforming leadership" (Burns, 2012), which is a process of enhancing maturity and motivating level between leaders and subordinates. It appears that there are two key areas in which school leaders might influence the professional growth of teachers: their capacity to influence the Change Environment by **providing opportunities to attend professional development and access** to other professional resources; and their capacity to provide input into **the external practices, for example, through engaging in professional** conversations with teachers, reflecting on practice with teachers, or by teaching model lessons. At this level, Managerial Effectiveness (ME) refers to the effectiveness of managerial practices to share power **through teachers' professional development, focusing on the crucial role** managers play as effective learners and managers, and their leadership

in influencing teacher professional development opportunities, activities and strategies.

Summary

To sum up, Principles of Knowles' adult learning theory provide **a basic theoretical foundation for understanding adult learning,** regarding adults as active learners with experiences. The adult **learning process could be considered as a continuous spiral learning** process with pervasive experiential perceptions (Knowles, 1984). Jarvis' constructivist definition of LLL views learning as meaning a construction process between prior experience and a new environment. At this level, adult learning theory is consistent with core meanings **studied in some researches that three integral elements of LLL are** 1) the whole person experiences: learners do cognitive, emotive or practical transforming work and integrate it into the individual person's biography; 2) social situations, that is the external environment: the perceived content of which learners experience interaction with learning contexts; 3) resulting in a constantly changing (or more experienced) person, which indicates the outcome of LLL is positive, leading to individual development.

One shared perspective is constructivism, which is consistent with the **three conceptions discussed above, and considering adult learning as a** continuously constructive process between individual perception and environmental impacts. University teachers are all adults, working in institutional organisations, whose autonomous learning process in professional development is expected to occur throughout their careers. Knowles' andragogy considers adult learners as more social individuals, whose learning process is an integrated process of self-directed learning, experiential learning and organizational learning, requiring individual **experiences and social environments, in interpersonal and intrapersonal** aspects, and cognitive and practical ways. According to Jarvis (2001, 2006, 2007), LLL tends to be supported by modern organisations to sustain their employees' professional and personal advancement of knowledge.

Hypotheses

In Organisation Learning Culture (OLC), the relationships between seven dimensions of the learning organisation and psychological

empowerment are positively related (Yang, Watkins & Marsick, 2004). Managerial Effectiveness (ME) is positively related to subordinates' learning behaviours and information management which are a part of employees' learning (Sambrook, 2005). With regard to the relationship between Learning Content Focus (LCF) and individual workplace learning, numerous studies have shown that effective professional development is intently related to deepening teachers' professional learning content (Penuel, Fishman, Yamaguchi, & Gallagher, 2007; Blank & de las Alas, 2008; Buczynski & Hansen, 2009). Moreover, empirical researchers demonstrated the power of Collaborative Learning (CL) to impact teacher and student learning (Ingvarson et al., 2005; Desimone, 2009; Opfer & Pedder, 2013).

Psychological empowerment (PE) had the strongest relationship with workplace learning (Sunyoung Park, 2011). Psychological empowerment plays an important role in recognising influence channels in the workplace, increasing reliance on horizontal structures and peer networks, and improving attachment between employees and organisations (Koberg, Boss, Senjem, & Goodman, 1999; Liden, Wayne, & Sparrowe, 2000; Cicolini, Comparcini, & Simonetti, 2014).

Thus, hypotheses proposed in this study to predict relationships of variables outlined in the proposed model (Figure 1) are:

1. Hypotheses of relationships between independent variables and **Pursuit of LLL are:**

   H1: Organization Learning Culture (OLC) has a positive impact on Pursuit of LLL.

   H2: Managerial Effectiveness (ME) has a positive impact on Pursuit of LLL.

   H3: Learning Content Focus (LCF) has a positive impact on Pursuit of LLL.

   H4: Collaborative Learning (CL) has a positive impact on Pursuit of LLL.

   H5: Psychological Empowerment (PE) has a positive impact on Pursuit of LLL.

2. Hypotheses of relationships between independent variables and psychological empowerment (PE) are:

   H6: Organization Learning Culture (OLC) has a positive impact on PE.

   H7: Managerial Effectiveness (ME) has a positive impact on PE.

   H8: Learning Content Focus (LCF) has a positive impact on PE.

   H9: Collaborative Learning (CL) has a positive impact on PE.

3. Mediating effect of Psychological Empowerment (PE) between organization factors and Pursuit of LLL are:

   H10a: PE plays a mediating effect in the impacts of OLC on Pursuit of LLL.

   H10b: PE plays a mediating effect in the impacts of ME on Pursuit of LLL.

   H10c: PE plays a mediating effect in the impacts of LCF on Pursuit of LLL.

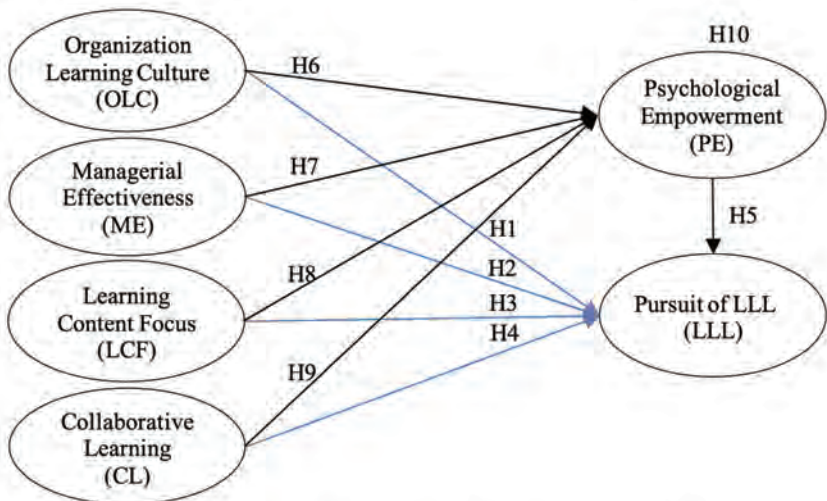   H10d: PE plays a mediating effect in the impacts of CL on Pursuit of LLL.

Figure 1 Framework of Research Model

Methodology

Instrument

The measurement phase of research involves the development of a researcher-generated survey instrument. The instrument designed for this study was a two-part questionnaire. Section I collected 9 items of demographic information about participants, and Section II consisted of 48 questions with a five-point Likert-type scale. The ordinal scale consisted of the following: 1. Strongly disagree, 2. Disagree, 3. Neutral, 4. Agree, and 5. Strongly agree.

Items in psychological empowerment were measured by the twelve items that Spreitzer (1995) integrated into separate scales adapted from Tymon (1988), Jones's (1986) self-efficacy scale, Hackman and Oldham's (1980) autonomy scale, and Ashforth's (1989) helplessness scale. The twelve items were divided into four subscales: Meaning (3 items), Self-efficacy (3 items), Self-determination (3 items), and Impact (3 items). Coefficient alphas for the four subscales ranged from .81 to .88 (Spreitzer, 1995).

As for Pursuit of LLL, items used in Crick, Broadfoot, and Claxton's ELLI Project (2004): the Evaluating Lifelong Learning Inventory (ELLI) furnished evidence-based references. ELLI was served to identify the components of lifelong learning and to assess an individual's lifelong learning orientation. ELLI "demonstrated a significant degree of stability, reliability and internal consistency over time" (Crick & Yu, 2008), with the Cronbach alpha coefficient associated with each scale ranging from 0.75 to 0.85, and remaining reliable and stable over repeated administrations. This study selected seven items that are representative of sub-scales. Together with items in Characteristics of Lifelong Learners in the Professions (CLLP) developed by Livneh to test factors impacting professional's willingness and ability to participate in LLL, shared conceptions were selected to test explicit learning performance in LLL behaviours.

Items in organizational factors were adapted from Yang's (2004) instrument: Dimensions of Learning Organisation Questionnaire (DLOQ). Yang and his colleagues (2004) shortened version has 21 items in seven dimensions, including continuous learning, dialogue

and inquiry, team learning, empowerment, embedded system, system connection, and strategic leadership. Coefficient alphas for the seven dimensions ranged from .68 to .83 (Yang et al., 2004). The results of the confirmatory factor analysis (CFA) showed that the seven factor structure fit the data reasonably well (RMSEA < .08; CFI > .90) (Ellinger, Ellinger, Yang, & Howton, 2002). This study adopted the essential items from each of the seven sub-constructs.

Samples and data collections

The nature of research questions directed the research design towards a quantitative approach. As Creswell (2005) stated, "In non-probability sampling, the researcher selects individuals because they are available, **convenient, and represent some characteristic the investigator seeks to study**" (p.149). This study adopted non-probability convenience sampling, soliciting participants working in sample universities located in Shandong province, China, because of the author's physical and social convenience.

To achieve a wider range of data for interpretive analysis, sample universities in this study included three private-owned universities **and four state-supported ones, embracing comprehensive universities** and universities with different professional attributes (Polytechnic, Teaching and Finance). All of these are categorised into one same level, comprehensive institutions (master's level institutions). Sample participants were both professional instructors who are mainly **responsible for academic curriculum teaching, and research-oriented** teachers conducting scientific or educational research. Teachers with no hierarchical position (professors, associate professors or lecturers) could participate in the study to enable a wide sample and obtain rich data. The researcher focused only on full-time faculty members whose **learning process is in the interest of the administrators to prioritise** compared to adjunct ones.

Two-Stage Sampling was used for this study. Hair, Black, et al. (2006) claimed that the sample size should be more than 100, and the number for Confirmatory Factors Analysis (CFA) should be five to ten times the number of observed variables. In pilot testing, participants were selected randomly by Human Resource Department (HRD) in sample universities. With the assistance of HRD, 180 questionnaires were sent out, and 172 were retrieved (156 valid and 16 invalid respondents); and 448 samples

went through as post survey (with total retrieval ratio being 74.6%), to monitor its relation model and the validity of model consistency.

Measures

Based on previous research in literature reviews, a researcher-generated survey instrument was developed. Validation was done in two ways: a trial expert and a pilot test.

Content Validity

A panel of experts was invited to establish content and confirm validity for the survey instrument before the initial use for data collection. The **panel consisted of seven distinguished scholars and experts, all of them** having research or management experience in fields of adult education or professional development.

Question items of the instrument designed for this study were translated into Chinese by the translation and back-translation procedure to ensure conformance. Any discrepancies were addressed and modified, as necessary to assure translation accuracy. Documenting item appropriateness was ensured in response to expert comments. After interviewing with experts one by one, all seven educators provided feedback that an acceptable level of validity has been achieved.

Construct Validity

The pilot test enabled us to check the reliability of the instrument, as well as the internal consistency and construct validity. The value of Cronbach's alpha was calculated and a value of 0.803 for the categorised values was acceptable. An exploratory factor analysis (EFA) was also made and the factors were confirmed with those that emerged from the literature review. The correlation matrix of all questions and Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO) were examined to determine the factorability of the results. After appropriate modification, we arrived at the final questionnaire (Table 1), which was to be validated. The results of the survey and implementation of the proposed model were analyzed by using the SPSS program, and AMOS for confirmatory factor analysis (CFA).

Table 1 Introduction of Study Instrument

Section	Construct	Items	Connotations
I (DV)	Pursuit of Lifelong Learning (LLL)	1-13	A dependent variable, focusing on both individual internal need for cognition and explicit learning performance.
II (Me)	Psychological Empowerment (PE)	14-25	Psychological states in which individuals feel a sense of control in relation to their work, including Meaning, Self-efficacy, Self-determination and Impact.
III (IV1)	Organization Learning Culture (OLC)	26-30	Institutional culture states, in which professional supports, political approval and learning culture are provided from organization.
IV (IV2)	Managerial Effectiveness (ME)	31-36	Managerial states in which supervisor managerial effectiveness is a crucial part that influences professional development opportunities, activities and strategies provided by department supervisors.
V (IV3)	Learning Content Focus (LCF)	37-42	Content in teachers' professional learning, including three main aspects: instructional knowledge, pedagogical knowledge and scientific research content knowledge.
VI (IV4)	Collaborative Learning (CL)	43-48	Learning spend in active learning and collaborative activities, describing learning occurs both in active learning as individual and collaborative participation as members in learning environment.

Notes: *DV=Dependable Variance; Me=Mediator; IV=Independable Variance*

Results

Reliability

Cronbach's alpha measures the internal consistency reliability, the extent to which survey items are related to one another, and is often used by researchers collecting survey data with Likert-type scales (Fowler, 1993). Alpha coefficients range in value from 0 to 1, with higher scores indicating greater reliability. Researchers generally regard reliability coefficients above 0.7 to be acceptable. In this study, all of Cronbach's alpha coefficients exceeded the minimum requirement of .70 and were acceptable (Table 2).

Table 2 Reliability of constructs

Constructs	α coefficient
1. LLL	.915
2. PE	.907
3. OLC	.880
4. ME	.951
5. LCF	.878
6. CL	.896

Notes: *LLL=Pursuit of Lifelong Learning; PE=Psychological Empowerment;*

OLC= Organizational Learning Culture ; ME= Managerial Effectiveness ; LCF=

Learning Content Focus; CL= Collaborative Learning

Construct validity

Besides factor loadings, results showed that composite reliability (CR) was above 0.80 (Table 3), reaching significant levels ($p < 0.01$), supporting the items as indicators of the latent variables they were designed to measure. Figures of the average variances extracted (AVE) were all higher than 0.60 level (Table 4), which means that the variance observed in the items was accounted for by their hypothesized factors. And the comparison between AVE and square values of correlations among constructs indicated that the discriminate validity existed among constructs, with AVE values exceeding the squared values of inter-construct correlations.

Table 3 Factor loading of Items (N=448)

Constructs	Items	Factor Loading	CR
Organizational Learning Culture (OLC)	OLC1	.75***	
	OLC2	.82***	
	OLC3	.77***	.891
	OLC4	.79***	
	OLC5	.81***	
Managerial Effectiveness (ME)	ME1	.73***	
	ME2	.81***	
	ME3	.81***	.918
	ME4	.80***	
	ME5	.79***	
	ME6	.80***	
Learning Content Focus (LCF)	LCF1	.77***	
	LCF2	.83***	
	LCF3	.82***	.922
	LCF4	.88***	
	LCF5	.75***	
	LCF6	.83***	
Collaborative Learning (CL)	CL1	.77***	
	CL2	.81***	
	CL3	.84***	.938
	CL4	.88***	
	CL5	.89***	
	CL6	.88***	
Psychological Empowerment (PE)	PE1	.83***	
	PE2	.82***	
	PE3	.80***	
	PE4	.87***	
	PE5	.87***	
	PE6	.74***	.957
	PE7	.79***	
	PE8	.72***	
	PE9	.84***	
	PE10	.80***	
	PE11	.78***	
	PE12	.79***	
Pursuit of Lifelong Learning (LLL)	LLL1	.73***	
	LLL2	.83***	
	LLL3	.81***	
	LLL4	.87***	
	LLL5	.82***	
	LLL6	.83***	
	LLL7	.85***	.932
	LLL8	.84***	
	LLL9	.83***	
	LLL10	.83***	
	LLL11	.84***	
	LLL12	.82***	
	LLL13	.79***	

***$p < .001$

Measurement model

Normality Distribution

Firstly, the data were normally distributed, with an absolute value of Skew being less than 2.000 (the highest value is -1.559), Kurtosis being less than 3.000 (the highest value was 1.890) and the Mardia coefficients of Multivariate normal distribution being 61.928 (far less than the Multivariate decision value (2400).

Measurement model

The standardised estimates for the measurement model showed the factor loadings of each item ranged from .63 to .89 (Table 3). Commonly recommended model-fit indices were calculated to assess the model's overall goodness of fit (Schumacker & Lomax, 2010): the ratio of Chi-square (χ^2) to degrees of freedom (df), Goodness of Fit Index (GFI), Adjusted Goodness of Fit Index (AGFI), Normalised Fit Index (NFI), Comparative Fit Index (CFI), Standardised Root Mean Square Residual (SRMR)and Root Mean Square Error of Approximation (RMSEA). The measurement model represented a good fit with the data collected: χ^2=3053.754; df =1059; χ^2/df=2.884; GFI=.926; AGFI=.907; NFI=.914; CFI=.906; SRMR=.030; RMSEA=.065.

Correlations

The correlation coefficients estimated in CFA showed that constructs kept insignificant correlations (Table 5). Four dimensions of organizational factors (OLC, ME, LCF and CL) are significantly correlated with personal PE and LLL. As for PE, the highest level of correlations existed between it and OLC (r=.671, P<.001). And in LLL, the higher level was between it and LCF, CL, with the correlation between it and LCF being r=.637 (P<.001) and CL being r=.605 (P<.001).

Table 5 Descriptive Statistics and Correlations Matrix (N=448)

Constructs	Mean	SD	1	2	3	4	5	6
1. OLC	3.767	.715	-					
2. ME	3.842	.925	.658**	-				
3. LCF	3.904	.746	.604**	.547**	-			
4. CL	3.941	.719	.656**	.498**	.568**	-		
5. PE	3.840	.649	.671***	.414***	.361***	.337***	-	
6. LLL	4.024	.718	.477***	.448**	.637***	.605***	.549***	-

Notes: OLC= Organizational Learning Culture ; ME= Managerial Effectiveness ; LCF= Learning
Content Focus; CL= Collaborative Learning; PE=Psychological Empowerment; LLL=Pursuit of Lifelong
Learning

** $p<.01$ *** $p<.001$

Structure model and hypotheses testing

In structural equation modelling (SEM), path models provided
an adequate fit to the data to test the proposed model. Collective
associations among the exogenous and endogenous variables and
standardized path coefficient estimates were considered to find out the
influential effect sizes of each relation. As the standard determinant for
the statistical significance of standardized path coefficients, the cut-off
t-value (t-value£æ|1.96|) was used. All path coefficients illustrated in
path models (Figure 2) showed results of nine hypotheses. The higher
the gamma (γ), the stronger the relationship is. Thus,
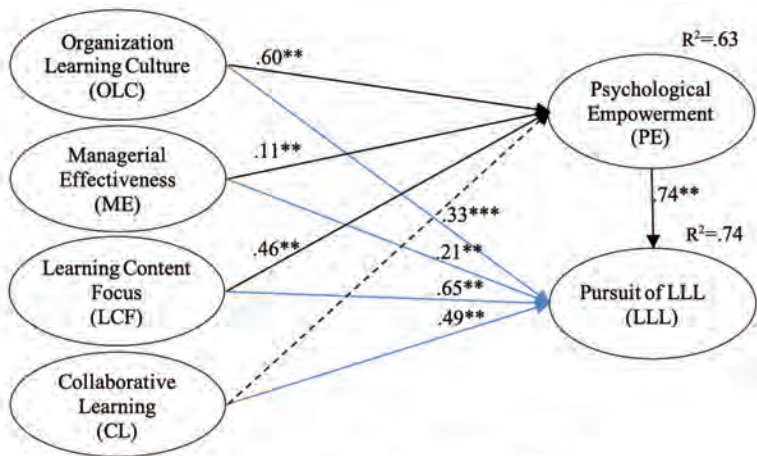

Figure 2 Hypotheses Test

Based on H1, H2, H3, H4, the hypotheses that significantly positive relationships exist between OLC, ME, LCF, CL and LLL were supported. Results from the model validated that a significant positive relationship existed between OLC (γ=.33, t=4.235), ME (γ=.21, t=3.437), LCF (γ=.65, t=3.438), CL (γ=.49, t=3.480) and LLL. In a university, higher levels of organizational factors in a learning culture, managerial effectiveness, learning content and collaborative learning activities will appeal to university teachers' higher lifelong learning.

As for the relationships between organizational factors and PE, the hypothesized positive impact of CL and PE, in H9, was not supported, with no significant relationship between them. In H6, H7 and H8, significant positive relationships existed between OLC (γ=.60, t=6.507), ME (γ=.11, t=3.415), LCF (γ=.46, t=3.953) and PE.

Within personal factors, the hypothesized significant positive relationship between PE and LLL (H5) was the strongest, with the path coefficient being β=.74 (t=6.315). Generally speaking, empowered employees will see themselves as more capable and will be able to influence their job and organisation in meaningful ways, leading to a high degree of commitment to their learning.

In addition, as for the proportion of total response variance explained by the model, squared multiple correlations (SMC) showed that the overall model accounted for 77 per cent of the in faculty members' LLL (R^2=.74) and 63 per cent in PE (R^2=63).

Furthermore, the mediating role of PE was tested using the Sobel (1982) **test to examine the reduction of the effect of a independent variable** on a dependent variable, after accounting for the mediating variables. Significant levels in Sobel test (Table 6) confirmed the effect of PE as a mediator between OLC, ME, LCF and individual LLL.

Discussions

Discussions of influential factors

The results verified significant relationships of Organizational Learning Culture (OLC), Managerial Effectiveness (ME), Learning Content Focus (LCF), Collaborative Learning (CL) and Psychological Empowerment (PE) with the pursuit of lifelong learning (LLL), which confirmed

them as influential factors in university teachers' lifelong learning in professional development.

Impacts of OLC and ME on LLL reflected their critical roles, indicating the importance of creating organizational learning cultures, and "promoting learning in the workplace through supports and commitment of practical activities", which broadened the research in exploring the relationships with organizational outcomes (Mo & Coulson, 2010; Sunyoung, 2011); PE, whose four dimensions conveyed psychological states and personal beliefs employees have on their roles in relation to their work (Spreitzer, 2007), had the strongest relationship with LLL.

Furthermore, the individual lifelong learning process showed that the general quality and learning capacity of the 21st century university teachers has been at a high level. Respondents showed their willingness to learn new things to improve capacity, and their tendency to enjoy challenges, and recognized the inner-power and collaboration with others. This included valuing "others as learning resources, actively listening to my peers' reflection and opinions", all of which highly accorded with characteristics identified by previous researchers that, "The uniqueness of lifelong learning demonstrated by lifelong learners is self-directed learning", "ability to choose and control learning and effectively organize resources to accomplish them" (Cranton, 2006), and "the need for changes" (Clarke and Hollingsworth, 2002).

However, items involving practical behaviour revealed the fall between ideology and actual performances, scoring relatively lower levels in working hours, learning plan, and less confidence in adjusting learning strategy, doing timely summary and reflection. This kind of fall might be caused by the "Social Expectation Effect" when respondents evaluated their capacity, leading to score towards higher levels. But university teachers' learning performance in professional development is typical workplace learning, which would also be influenced by many other factors, like life experiences (Knowles et al., 2005), desire for socialization, organizational strategic policy (Johnson and Beehr, 2014), etc.

Discussions of relationships

It was found that OLC, ME, LCF, CL and PE positively impacted LLL. In particular, PE played an important role in enhancing lifelong learning in

professional development (Linden et al., 2000). The result in this study is consistent with the findings of Sunyang (2011) that organizational learning culture, managerial effectiveness and psychological empowerment have significant and positive impacts on workplace learning of employees in for-profit organizations located in Korea. However, the relatively lower scores in Self-determination and Impact indicated university teachers' less independence and freedom in the decision on learning or working; and they did not believe individual performance means something in the department. In this way, the result may imply their hesitation to feel capable of work-related actions and being less motivated to the demands of each unique situation (Linden et al., 2000).

In OLC, its positive correlations with PE and LLL indicated that by improving the organizational learning culture, university teachers' PE and LLL levels would be enhanced. In ME, although large numbers of researchers emphasized the managers' significant influence on the teachers' capacity to enact professional learning (Park, Choi, 2016; Lachance & Confrey, 2003), ME functioned the lowest on PE and LLL. **The reason for this phenomenon might be the nature of PE that is** defined as "the empowerment construct at individual level" (Leung, 2009; Mo & Coulson, 2010; Schneider, Von Krogh, & Jäger, 2013), "intrinsic task motivation in which individuals feel a sense of control in relation to their work" (Spreitzer, 2007); professional development is more influenced by external factors, whereas, lifelong learning is more personal. And ME's scores on LLL showed the low effectiveness of managers in universities acting on individual lifelong learning.

In LCF, understanding of LCF matters on how to improve university teachers' LLL level. Scientific research achievement was considered the most important measurement in their professional development. However, the data showed "practical skills and pedagogical knowledge" was perceived at a relatively higher level, while "scientific research knowledge" was lower and "theoretical and academic knowledge" was the lowest. The discrepancy might partially reveal why professional development initiatives were less efficient and learning behaviours scored lower. In CL, valid collaborative learning works in improving university teachers' LLL level. Effective collaborative learning includes opportunities to engage in active learning (Desimone, 2009), in which time allotment, external partnerships, campus coworkers, discussions on both teaching strategies and scientific researching projects, and

timely feedback need to be guaranteed. Compared with suggestions that engagement with professional development outside of university is valued more than that which is available internally (Jennifer, 2014), the relatively lower scores in "opportunities for teachers to learn with external partnerships" indicated the gap between learning expectations and actual learning opportunities. The absence of diversity of collaborative learning forms and activities is discouraging university teachers' learning opportunities and quality, which could hardly **meet the learning need as required in their professional development** evaluation system.

However, CL in this study scored no insignificant relationship with PE, which means, for one thing, university teachers shared little changes or reflections on meaning, self-efficacy, self-determination and impact in CL activities, and on the other hand, CL activities function ineffectively in improving teachers' PE. Opfer & Pedder (2013) affirmed that teachers cannot freely engage in collaborative inquiry and professional knowledge building if they are feeling criticised or put down for not being competent within their profession. Similarly, Su (2011) noted that teachers often work in isolation for much of the day and so they are missing the evaluative process or positive feedback that can calm anxiety and stress related to work performance.

Thus, mediating role of PE between OLC, ME, LCF and university teachers' LLL were supported, which enriched the studies focused on the mediating effects of psychological empowerment between organizational context and subsequent outcomes.

Practical Implications

Results in this study suggested several implications for university administrators to form professional development interventions. University administrators could use factors influencing lifelong learning as interventions to improve professional development. For instance, Human Resource Department (HRD) could help employees pursue learning during their experience and adaption to organizational changes. The weakness of a fragmented management system warns providers of the necessity to build cohesive and systematic functions among separated units. At this point, university administrators should create a more conducive organizational learning culture and provide

support through a partnership with more diversified departments (internally or externally). What's more, university teachers are supposed to be encouraged to perceive the support (e.g., supervisory support) that fosters their efforts to learn and perform in a new organizational **context, creating appropriate environments to enhance and exhibit the** preferences of a learning culture.

In terms of managerial effectiveness and psychological empowerment, university administrators should lay more consideration on the roles of managers. Outstanding managers can be role models for those who are interested in preparing for future careers and conducting learning. By identifying the excellent qualities of selected managers in performance and effectiveness and exploring how to sustain their excellence in given conditions, university administrators could design and develop customized programs for professional development.

As for intrinsic motivation, university administrators could provide **more learning opportunities for teachers to foster their motivation,** confidence, and autonomy for conducting learning. It is important to share with teachers the belief that learning opportunities can be a vehicle for resolving both individual and organizational issues. University administrators should understand which programs and interventions, e.g., workplace blended learning and communities of practice, work for leading employees to engage in continuous learning.

Conclusions

This study emphasized the lifelong learning ideology in professional development. Findings confirmed Javis' argument that lifelong learning is a constantly reconstructed process. The model of influential factors postulated in this study supports the notion that lifelong learning could be influenced by both individual and external environment factors. The significant positive relationships of variables demonstrated Organizational Learning Culture (OLC), Managerial Effectiveness (ME), Learning Content Focus (LCF), Collaborative Learning (CL) and Psychological Empowerment (PE) as influential factors. And PE acted as mediating roles between OLC, ME, LCF and LLL.

Some problems that arose in this study exposed university teachers' hesitance in conducting learning. They felt less autonomy and did not believe many problems could be solved through their efforts.

Administrators (managers) had less impact on the teachers' mental state, and the teachers' learning seemed more personal in an organization. **As for the concrete matters related to individual learning**, **universities** provided less appropriate learning content schemes and lacked a diversity of learning opportunities, which would influence teachers' psychological empowerment physically and mentally. All the problems provided a clear picture for university administrators to bridge the gaps between individual learning processes and organizational learning supports. **Discussions on the reasons for these discrepancies**, **and the solutions to** solve these phenomena would be of great significance.

Limitations and suggestions for future research

Many of the findings presented in this study would merit further investigation. This study had made an exploratory attempt to do simple **measurements of learning behaviours**, **like learning time**, **motivation**, mode, frequency and learning strategy. A more holistic approach that takes into account the full complexity of influential factors and the relationships between lifelong learning inner cognitive characteristics and explicit lifelong learning behaviours would make a valuable contribution to knowledge on this topic.

As for the methodology, the sampling was selected from universities **located in Shandong province**, **China because of personal convenience**, a larger scaled sample data would be preferred for its generalization. In designing the questionnaire, this study adopted a conservative way of compiling items, mainly from previous research results. The **measurement instrument could be designed more advanced in time**, blending factors with characteristics of the 21st century, such as learning with digital technologies, collaborative learning in an E-learning platform, and methods of more detailed data resources collected by internet tools, etc.

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