Kasetsart Journal of Social Sciences

Comparison of lifelong learning mindset, learning habits, and self-directed learning among elementary school teachers with different backgrounds

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Article Info

Abstract

Fostering teachers as lifelong learners requires a deep understanding of key mobilizing factors towards lifelong learning, with emphasis on lifelong learning mindset, learning habits, and self-directed learning. The objectives of this research are to analyze and compare the lifelong learning mindset, learning habits, and self-directed learning among elementary school teachers with different backgrounds, including gender, work experience, school size, and school affiliation. The population of the study consists of elementary school teachers. The sample includes 943 teachers selected using a stratified random sampling technique. Research instruments include a 5-level Likert scale questionnaire. The findings reveal that the means of lifelong learning mindset, learning habits, and self-directed learning range between 4.28 and 4.57, indicating relatively high levels. There were no significant differences in lifelong learning mindset among teachers based on gender, work experience, school affiliation, and school size. However, teachers with 1–5 years of work experience (4.42) exhibited higher learning habits (4.29) than those with 11 years or more, and the means of learning habits, and self-directed learning among teachers from different school affiliations were significantly different.

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Introduction

The teaching profession involves the responsibility of imparting knowledge to students and serving as role models for their personal development, fostering continuous learning, and staying abreast of contemporary changes (Boylan et al., 2018). Teachers must engage in ongoing learning to maintain a perpetual state of knowledge and competence.

According to the related literature, there are numerous variables supporting lifelong learning (LLL), referred to in this paper as key mobilizing factors towards LLL. These factors encompass individuals, resources, and various actions contributing to continuous personal

learning. Contemporary research tends to pay attention to the study of the factors influencing LLL, rather than focusing directly on LLL variables as predominantly found in previous research.

The selected variables which are of interest from the related research consist of lifelong learning mindset (LLM), learning habits (LH), and self-directed learning (SDL). LLM refers to beliefs and attitudes reflecting an open-minded approach, a willingness to self-develop for personal progress (Govender & Valand, 2021; Nerison, 2021; Smith & Meaney, 2016). LH involves persistent efforts and continuous work, leading to success and eventually transforming into ingrained habits (Darling-Hammond et al., 2017; Harris, 2011; Johnson & Birkeland, 2003). SDL allows learners, which in this research means teachers, manage their own learning throughout the entire process (Knowles, 1975).

Research into these types of variables is considered significant and intriguing, grounded in the belief that promoting LLL through key mobilizing factors contributes to the development of LLL competencies (Annuar et al., 2022). However, it is worth noting that research in these areas, especially with teachers in Thailand, remains relatively limited. This research, therefore, aims to emphasize the importance of investigating factors driving towards LLL including LLM, LH, and SDL.

Since the researchers aim to utilize the research findings to promote lifelong learning through key mobilizing factors, the study needs to narrow down its research scope. This is because designing strategies to enhance lifelong learning, including LLM, LH, and SDL of elementary and secondary school teachers, should differ. This is confirmed by the study of Exline (2022) who found that the work practices of elementary school teachers focus on holistic student development including academic readiness, social learning, and emotional learning while secondary school teachers focus on developing students' performance in their responsible subjects. The learner development goals of secondary school teachers focus more on academic performance than holistic student development, as seen in elementary school. Therefore, this study specifies the target group as elementary school teachers to ensure that the research findings can be effectively applied in designing learning promotion processes for elementary school teachers.

Literature Review

Promoting LLL involves understanding two primary categories of factors: Personal and environmental factors (Acar & Ucus, 2017). Existing research predominantly underscores personal factors, which constitute internal forces that individuals actively cultivate within themselves. These encompass mindset, attitude, habits, motivation, skills, and self-directed learning (Parmelee et al., 2020; Toh et al., 2022). Additional components include an interest in learning, proactive efforts to overcome obstacles (Ricotta et al., 2022; Sproule et al., 2019), an open-minded approach, acceptance of developmental opportunities, willingness to learn, and a positive attitude towards adapting to work involving modern technology (Kılıç & Kılıç, 2022). While researchers may use different terminology for these variables, commonalities in their meanings or characteristics often exist. Therefore, these variables are collectively organized into key mobilizing factors towards LLL. The following concepts of each factor will justify its significance to LLL enhancement, helping design the measurement instrument.

Lifelong Learning Mindset (LLM)

Derived from Dweck's (2006) theory of "growth mindset", the Lifelong Learning Mindset (LLM) distinguishes between fixed and growth mindsets. Embracing a growth mindset, which involves believing in personal development, is strongly associated with increased success rates. This mindset embodies openness, a predisposition towards self-improvement, enthusiasm for learning and tackling challenges, and serves as a foundation for both personal and professional accomplishments (Drewery et al., 2020; Sloychuk et al., 2020; Sproule et al., 2019; Valtierra & Siegel, 2022).

Learning Habits (LH)

Inspired by Clear's (2018) concept of Atomic Habits, learning habits aim to mold individuals' identities towards beneficial objectives. This entails establishing manageable, incremental goals, fostering resilience, maintaining determination and perseverance, and gradually adopting behaviors until successfully achieving these smaller goals (Clear, 2018; Urh & Jereb, 2014).

Self-Directed Learning (SDL)

Originally introduced by Knowles (1975) within adult education, Self-Directed Learning (SDL) empowers learners to determine their objectives, select appropriate learning approaches, and oversee their own learning process. The five stages encompass creating a conducive learning environment, identifying learning needs, setting objectives, planning and managing learning activities, and evaluating and reflecting on the learning journey (Ambrose et al., 2010; Garrison, 1997; Harris & Gibson, 2021; Knowles, 1975; Wilson, 2015).

Related Research on the Key Mobilizing Factors towards LLL

Research on variables related to LLL indicates several significant factors influencing individuals' learning experiences throughout their lives. These variables include gender, age, work experience, and environmental factors in the workplace, such as organizational atmosphere and support. Notably, for the demographic group of teachers, significant findings have emerged regarding their educational levels and their impact on student learning:

Personal Variables

BAYRAKÇI and Dindar (2015) analyzed factors affecting LLL among undergraduate students, including gender, age, grades, and family income. Their research suggests that gender does not significantly contribute to LLL differences except in sub-components related to the desire for learning, where females show higher levels. Furthermore, LLL seems to be dependent on the specific course of study, rather than age, grades, or family income. Kılıç and Kılıç (2022) compared LLL tendencies and attitudes towards technology use among teachers based on gender, education level, and reading frequency. They found that female teachers, those with higher education levels, and those who frequently read books, newspapers, magazines, and articles tend to have higher levels of lifelong learning. Additionally, teachers with less than 10 years of work experience are more open to development compared to those with more experience. Regarding the study of SDL, Reio and Davis (2005) examined age and gender differences in SDL among students. They found that age plays a crucial role in readiness for SDL with older individuals demonstrating higher readiness compared to younger ones. Females tend to exhibit higher levels of readiness for SDL than males.

Kalin et al. (2017) compared primary and secondary school teachers regarding goal setting. They found that secondary school teachers show greater interest in goal setting. However, in terms of creating a classroom atmosphere, primary school teachers exhibit lower levels of interest. Exline (2022) synthesized research on the work practices of primary and secondary school teachers globally, highlighting differences in teaching approaches and student goals. In primary education, the focus is on holistic student development, including readiness for learning, social learning, and emotions. In contrast, secondary education emphasizes students' performance in specific subjects rather than holistic development.

Environmental and School Context Factors

For the environmental factors, Acar and Ucus (2017) elaborate that external factors may stem from support for learning from others such as colleagues, supervisors, mentors, as well as physical support for learning, educational technology that promotes learning, or even organizational policy factors, all of which play a role in fostering individual learning. For example, school policies and readiness to support teacher learning may vary.

In summary, several variables contribute to explaining the driving factors behind LLL. These independent variables fall into two groups: Teacher background variables and school context variables. Teacher background variables include gender, work experience, and school context, while school context variables encompass aspects such as school policy and readiness to support teacher learning (Acar & Ucus, 2017). In this study, school affiliation is considered as a variable reflecting school policies promoting teacher learning, while school size reflects the readiness of the school to support teacher learning.

Research Objectives

The objectives of this research are twofold: (1) to analyze the LLM, LH, and SDL of elementary school teachers; and (2) to compare the LLM, LH, and SDL among elementary school teachers with different backgrounds.

Conceptual Framework

Figure 1 show the research framework aiming to investigate and analyze teachers' key mobilizing factors towards LLL. The pivotal learning variables encompass LLM, LH, and SDL. According to the related research, the independent variables, which act as explanatory variables for the set of driving factors towards LLL, include teacher demographic variables consisting of gender (male, female), work experience (1-5 yrs., 6-10 yrs., >10 yrs.), and school contextual variables consisting of school size (small, medium, and large sizes) and school affiliation. This study specifies the school affiliation variable into four affiliations, i.e. public schools under the Office of Basic Education Commission (OBEC), private schools under the Office of Private Education Commission (OPEC), schools under the office of Local Area Administration (LAA), and schools under Bangkok Metropolitan Administration (BMA).
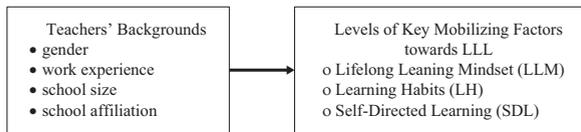
Figure 1 Conceptual framework

Methodology

This section provides the details of the research method, population, sample measurement instruments, examination of the quality of the developed instrument, data collection, and data analysis.

Population and Sample Size

The population of this study consists of elementary school teachers from each school affiliation. The sample size for the teacher population was determined based on Cohen's formula, using the G*power program, and calculated using ANOVA statistics, with a moderate effect size (.15), an alpha level of .05, and a power of .95. The minimum accepted sample size was determined to be 934 individuals. The teacher sample was randomly selected using a stratified random sampling technique to ensure proportional representation across distinct strata such as region, school affiliation, and school size.

Measurement Instruments

The measurement instrument is a questionnaire with Likert's 5-point rating scale consisting of the LLM scale, LH scale, and SDL scale with 10 items, 10 items, and 15 items, respectively. The operational definitions of the three variables are as follows.

Operational definition

Lifelong learning mindset comprises teachers' perception, attitudes, and constructive actions concerning lifelong learning. This mindset consists of three sub-components: M1: Perception of the importance of self-learning development, M2: Positive attitude towards lifelong learning, and M3: Determination and commitment to learning.

Learning habits denote continuous personal development behaviours geared towards personal development, fostering a disposition for continuous learning. It encompasses three sub-components. H1: Goal setting for cultivating positive learning habits, H2: Engaging in self-practice to attain learning objectives, and H3: Maintaining continuous learning until it becomes a habit.

Self-directed learning entails a learning approach that emphasizes empowering learners to take ownership of their learning, exercising autonomy in establishing learning objectives and selecting suitable learning methods, and guiding their own learning journey. It includes five sub-components: S1: Creating a learning climate for oneself, S2: Diagnosing learning needs, S3: Setting learning goals, S4: Planning and managing learning, and S5: Evaluating and reflecting on the learning experience.

Two supplemental variables, learning strategy preferences and problems in learning of teachers, totaling 9 items, were included in the questionnaires to elucidate the levels of key mobilizing factors identified in the survey. These variables were derived from interviews with seven school administrators and elementary teachers who willingly provided information about teachers' learning.

Examination of the quality of the developed instrument

The quality of the instruments was examined based on content validity, internal consistency reliability, and construct validity, as detailed below.

1) Content Validity

The content validity of the questionnaire was analyzed by assessing the relevance of each item to the operational definition, based on experts' opinions using the CVR index (Content Validity Ratio) developed by Lawshe (1975). The analysis in Table 1 revealed that CVR ranges between .71 and 1.00. The overall Content Validity Index (S-CVI) for LLM, LH, and SDL was .97, .92, and 1.00, respectively, showing a high level of content validity.

2) Internal Consistency Reliability

The internal consistency of the instrument was examined separately for the trial version (70 participants) and the actual in-use version (943 participants). The results are detailed in Table 1. The internal consistency reliabilities for the in-use version instruments range between .93 and .96, which are very high, reflecting consistency among items and indicating that they measure the same construct.

Table 1 Content validity and internal consistency reliability of the instruments

Key Mobilizing Factors	No. of Items	Content Validity Index		Internal Consistency Reliability	
		CVR	S-CVI	Trial Version ($n = 70$)	In-Use Version ($n = 943$)
1. LLM Scale	10	0.71–1.00	0.97	.94	.93
2. LH Scale	10	0.71–1.00	0.92	.93	.95
3. SDL Scale	15	1.00	1.00	.96	.96

3) Construct validity

Construct validity was assessed through exploratory factor analysis (EFA) using SPSS, followed by confirmatory factor analysis (CFA) using the Mplus program. The sample of 943 teachers was used to determine the construct validity of the instrument. Hu and Bentler (1999) suggested model fit testing in the article "Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives" in Structural Equation Modeling: A Multidisciplinary Journal. They explained that due to the chi-square statistic's sensitivity to sample size, various alternative indices have been proposed to evaluate model adequacy. In practical terms, it is recognized that the chi-square test does not always provide the definitive assessment of fit. They recommended reporting and evaluating a minimum set of indices, including chi-square, RMSEA, CFI, and SRMR, to provide a comprehensive assessment of fit considering factors such as sample size, model complexity, and other relevant considerations specific to the study at hand. Based on this guidance, CFA results indicated that all three variables have construct validity as evidenced by the following details.

1) LLM Scale. The results show that the measurement model aligns well with the observational data (Chi-Square = 90.337, df = 33, n = 943, p = .000, CFI = .974, TLI = .964, SRMR = .119, RMSEA = .043).

2) LH Scale. The results show that the measurement model aligns well with the observational data (Chi-Square = 72.878, df = 32, n = 943, p = .000, CFI = .988, TLI = .982, SRMR = .019, RMSEA = .037).

3) SDL Scale. The results show that the measurement model aligns well with the observational data (Chi-Square = 385.534, df = 85, n = 943, p = .000, CFI = .956, TLI = .946, SRMR = .031, RMSEA = .061).

Data Collection

This research utilized an online data collection method using Google Forms. It took approximately 1 month after obtaining research ethics approval from Chulalongkorn University's Institutional Review Board (IRB) on September 22, 2023. Questionnaires were sent to coordinators within school networks and teachers in each district. Data were collected from schools distributed across the four geographic regions of Northern, Central, Northeastern, and Southern Thailand, as well as schools affiliated with the OBEC, OPEC, LAA, and BMA. The aim was to cover a different range of school affiliations and school sizes of elementary schools.

In total, surveys were collected from approximately 1,074 teachers. Subsequently, only complete questionnaires were selected for analysis, focusing exclusively on teachers instructing at the elementary level. A total of 943 complete surveys were deemed suitable for analysis, aligning with the predetermined sample size.

The collected data were treated with utmost confidentiality, and processing was conducted summarily. Table 2 shows that the proportion of teachers from each school affiliation was almost equal (ranging from 19.09% to 27.36%), except for teachers from BMA, whose proportion was smaller than the others. Teachers from large schools constituted a higher percentage (46.13%) compared to those in small (25.24%) and medium (28.63%) sized schools. Most respondents were female teachers (80.06%), and half of them (54.40%) had more than 10 years of work experience.

Data Analysis

To analyze the levels of LLM, LH, and SDL, descriptive statistics were employed, including frequency, percentage, arithmetic mean, standard deviation, median, SE of skewness, and SE of kurtosis, calculated using SPSS software. Two methods were used to determine the cutoff scores for interpreting the levels of key mobilizing factors. The first method employed criterion-referenced assessment based on a 1–5 rating scale, with cutoff scores defined for the lowest (1.00–1.50), low (1.51–2.50), moderate (2.51–3.50), high (3.51–4.50), and highest levels (4.51–5.00).

Table 2 Backgrounds of Elementary School Teachers.

School Affiliation	n	%	School Size	n	%
1. OBEC	251	26.62	1. Small	238	25.24
2. OPEC	254	26.93	2. Medium	270	28.63
3. LAA	258	27.36	3. Large	435	46.13
4. BMA	180	19.09			
Total	943	100.00	Total	943	100.00
Gender	n	%	Work Experience	n	%
1. Male	188	19.94	1. 1–5 yrs.	242	25.66
2. Female	755	80.06	2. 6–10 yrs.	188	19.94
			3. > 10 yrs.	513	54.40
Total	943	100.00	Total	943	100.00

The second method utilized norm-referenced assessment using percentile rank (PR). Data points falling below the 30th percentile are considered low, those between the 30th and 79th percentiles are deemed moderate, and those at the 80th percentile and above are classified as high.

Analysis of Variance (ANOVA) was utilized to compare the mean differences of LLM, LH, and SDL among different teacher backgrounds (gender, work experience, school affiliation, and school size). Levene's test was performed to assess the assumption of homogeneity of variance. If the data violate this assumption, the Welch F-test will be employed for its robustness and general applicability, particularly useful in guarding against potential Type II errors (Blanca et al., 2017; Khan & Rayner, 2003). Moreover, if the F-test results from ANOVA are significant, post-hoc analyses will be conducted using Sheffe's test to identify the groups that differ.

Results

The results consist of two parts: Part One: Levels of LLM, LH, and SDL, and Part Two: Comparisons of LLM, LH, and SDL among teachers with different backgrounds.

Part One: Levels of LLM, LH, and SDL

This section analyzes teachers' key mobilizing factors towards LLL, consisting of LLM, LH, and SDL. Furthermore, the findings will categorize groups based on these three variables and explore teachers' preferences for learning strategies as well as the challenges they encounter in their own learning, thereby enhancing the understanding of the results.

Table 3 presents the analysis results of the three variables. The data analysis indicates that, overall, teachers report having a high LLM, high LH, and high SDL, with some variations in the distribution of scores. The details are as follows:

Level of LLM

Table 3 illustrates LLM, showing the highest average level (M = 4.57, SD = 0.47). Subsequent analysis reveals that all aspects have the highest average level. M1: Perception of the importance of self-learning development (*M* = 4.62, *SD* = 0.49) scored higher than the other two components. Both M2: Positive attitude towards lifelong learning (*M* = 4.55, *SD* = 0.53) and M3: Determination and commitment to learning (*M* = 4.51, *SD* = 0.56) had closely similar average values.

Level of LH

The analysis results of the overall level of LH indicate a high level (*M* = 4.34, *SD* = 0.56). Further analysis of sub-component reveals that all three aspects have high average values. H1: Goal setting for cultivating positive learning habits (*M* = 4.39, *SD* = 0.59), and H3: Maintaining continuous learning until it becomes a habit (*M* = 4.36, *SD* = 0.60) have similar average values. H2: Engaging in self-practice to attain learning objectives (*M* = 4.26, *SD* = 0.62) is also at a high level but slightly lower than the other two components.

Table 3 Levels of Three Key Mobilizing Factors towards LLL

	Variables	*M*	*SD*	Skewness	Kurtosis	Median	Mode
1	Lifelong Learning Mindset	4.57	0.47	-1.08	0.82	4.70	5.00
	1.1 Perception of the importance of self-learning development	4.62	0.49	-1.27	1.21		
	1.2 Positive attitude towards lifelong learning	4.55	0.53	-1.00	0.43		
	1.3 Determination and commitment to learning	4.51	0.56	-1.02	0.83		
2	Learning Habits	4.34	0.56	-0.57	-0.26	4.40	5.00
	2.1 Goal setting for cultivating positive learning habits	4.39	0.59	-0.76	0.25		
	2.2 Engaging in self-practice to attain learning objectives	4.26	0.62	-0.44	-0.43		
	2.3 Maintaining continuous learning until it becomes a habit	4.36	0.60	-0.68	-0.07		
3	Self-Directed Learning	4.28	0.57	-0.56	0.02	4.27	5.00
	3.1 Creating a learning climate for oneself	4.32	0.60	-0.64	0.11		
	3.2 Diagnosing learning needs	4.32	0.62	-0.68	0.46		
	3.3 Setting learning goals	4.31	0.63	-0.60	-0.22		
	3.4 Planning and managing learning	4.23	0.65	-0.58	0.17		
	3.5 Evaluating and reflecting on the learning experience	4.20	0.65	-0.56	0.01		

Note: 1) level of mean ranges between 1–5; SE of skewness = 0.08, SE of kurtosis = 0.16

2) Criterion-referenced Interpretation: lowest (1.00–1.50), low (1.51–2.50), moderate (2.51–3.50), high (3.51–4.50), highest (4.51–5.00)

3) Norm-referenced interpretation: low (< 4.00 = below 30th percentiles), moderate (4.00–4.99 = 30th–79th percentiles), high (5.00 = above 79th percentiles)

Level of SDL

The overall level of SDL among teachers is at a high level (M = 4.28, SD = 0.57). Sub-analysis shows that all aspects are at a high level. S1: Creating a learning climate for oneself (M = 4.32, SD = 0.60), S2: Diagnosing learning needs (M = 4.32, SD = 0.62), and S3: Setting learning goals (M = 4.31, SD = 0.63) have closely similar average values. S4: Planning and managing learning (M = 4.23, SD = 0.65), and S5: Evaluating and reflecting on the learning experience (M = 4.20, SD = 0.65) also have similar average values, albeit slightly lower.

Group classification by key mobilizing factors

Since the respondents perceived very high average levels of LLM, LH, and SDL, and the scores were clustered within groups, group classification was conducted using the concept of norm-referenced assessment. This was achieved by analyzing percentile ranks (PR) to classify the groups into three levels: low, moderate, and high. The analysis results showed that individuals with a full 5 points scored at the 80th percentiles and above, indicating a high level. Scores between 4.00 and 4.99 fell within the 30th to 79th percentiles, indicating a moderate level. Those scoring below 4.00 were below the 30th percentile, indicating a low level. To facilitate straightforward grouping and to avoid complications, teachers scoring a full 5 points were designated as belonging to the high group, those scoring between 4.00 and 4.99 were designated as belonging to the moderate group, and those scoring below 4.00 were designated as belonging to the low group.

The following findings present the classification of teachers based on their levels of key mobilizing factors, using LLM as a fundamental factor driving individuals to recognize the value of LLL. Teachers are classified into three groups: those with low, moderate, and high levels of LLM. Under each group of LLM, teachers are further classified into 9 sub-groups based on their levels of LH and SDL. Therefore, there are 27 sub-groups for the group classification.

Table 4 shows that teachers with a low level of LLM comprised a total of 90 individuals (9.54%). The moderate level of LLM group consisted of 551 individuals (58.43%), and the high level of LLM group consisted of 302 individuals (32.03%). That means, most teachers, approximately 58 percent, have a moderate level of LLM.

Teachers with low, moderate, and high levels for all three variables, are referred to as the LLL group (low levels of LLM, LH, and SDL), the MMM group (moderate levels of LLM, LH, and SDL), and the HHH group (high levels of LLM, LH, and SDL. It is observed that the proportion of LLL, MMM, and HHH groups are 7.32 percent, 34.99 percent, and 13.26 percent, respectively. The proportion of the most satisfied group (HHH) is only 13.26 percent, while the most concerned group (LLL) is 7.32 percent. It is noticed that among the moderate level of LLM group, most teachers are in the MMM group (34.99%).

Learning strategy preferences and problems in learning of teachers

This part presents the supplemental variables to elucidate the analysis results of learning strategy preferences and problems in learning of teachers. The results are presented in Table 5.

1) Learning strategy preferences

The survey results reveal that teachers exhibit varying preferences for different learning methods. While each method's mean is relatively high, the most favored learning method is learning from peers inside/outside the school (M = 4.24, SD = 0.75). Following closely are learning from mentors (M = 4.15, SD = 0.81) and learning from seminars/workshops (M = 4.06, SD = 0.88). The least favored methods include learning from research conduction (M = 3.95, SD = 0.90) and learning from reading academic documents, books (M = 3.94, SD = 0.94).

Table 4 Group Classification by Key Mobilizing Factors

Group I	LLM	LH	SDL	Group	n	%
Groups with low LLM					90	9.54
1	L	L	L	LLL	69	7.32
2	L	L	M	LLM	3	0.32
3	L	L	H	LLH	0	-
4	L	M	L	LML	7	0.74
5	L	M	M	LMM	10	1.06
6	L	M	H	LMH	0	-
7	L	H	L	LHL	0	-
8	L	H	M	LHM	0	-
9	L	H	H	LHH	1	0.11

Table 4 Continued

Group II	LLM	Habits	SDL	Group	*n*	%
Groups with moderate LLM					551	58.43
10	M	L	L	MLL	88	9.33
11	M	L	M	MLM	24	2.55
12	M	L	H	MLH	0	-
13	M	M	L	MML	60	6.36
14	*M*	*M*	*M*	*MMM*	*330*	*34.99*
15	M	M	H	MMH	7	0.74
16	M	H	L	MHL	0	-
17	M	H	M	MHM	26	2.76
18	M	H	H	MHH	16	1.70
Group III	**LLM**	**Habits**	**SDL**	**Group**	***n***	**%**
Groups with high LLM					302	32.03
19	H	L	L	HLL	4	0.42
20	H	L	M	HLM	5	0.53
21	H	L	H	HLH	0	-
22	H	M	L	HML	12	1.27
23	H	M	M	HMM	93	9.86
24	H	M	H	HMH	14	1.48
25	H	H	L	HHL	2	0.21
26	H	H	M	HHM	47	4.98
27	H	H	H	HHH	125	13.26
Total					943	100

Note: < 4.00 = Low, 4.00–4.99 = Moderate, 5 = High
Correlation coefficients among LLM, LH, and SDL are .72–.87

Table 5 Learning strategy preferences and problems in learning of teachers

1	Learning Strategy Preferences	*M*	*SD*	Skewness	Kurtosis
1.1	learning from peers inside/outside the school	4.24	0.75	-0.70	0.15
1.2	learning from mentors	4.15	0.81	-0.71	0.11
1.3	learning from seminars/workshops	4.06	0.88	-0.87	0.83
1.4	learning from research conduction	3.95	0.90	-0.64	0.21
1.5	learning from reading academic documents, books	3.94	0.94	-0.78	0.38
2	**Problems in Learning**	***M***	***SD***	**Skewness**	**Kurtosis**
2.1	encounter issues in implementing teaching methods aligned with new educational policies	3.17	1.30	-0.19	-1.03
2.2	information retrieval, acquiring new knowledge, summarizing, or processing learning outcomes	3.17	1.32	-0.23	-1.09
2.3	time allocation for self-development	3.11	1.30	-0.21	-1.06
2.4	adapting or integrating new knowledge with prior experiences in professional practice	3.00	1.34	0.00	-1.16

Note: n = 943
Interpretation: lowest (1.00–1.50), low (1.51–2.50), moderate (2.51–3.50), high (3.51–4.50), highest (4.51–5.00)

2) Problems in learning

An analysis of teacher's problems in learning across four items reveals that teachers face moderate-level challenges. Teachers encounter issues in implementing teaching methods aligned with new educational policies ($M = 3.17$, $SD = 1.30$) and challenges related to information retrieval, acquiring new knowledge, summarizing, or processing learning outcomes ($M = 3.17$, $SD = 1.32$). Subsequently, time allocation for self-development ($M = 3.11$, $SD = 1.30$) and adapting or integrating new knowledge with prior experiences in professional practice ($M = 3.00$, $SD = 1.34$) present the least significant challenges.

Part Two: Comparisons of LLM, LH, and SDL among teachers with different backgrounds

ANOVA was performed to compare the means of LLM, LH, and SDL across various teacher background groups. The results of these ANOVA tests are presented below:

1. Comparison of LLM among teachers with different backgrounds

Table 6 shows Levene's test for homogeneity of variances, indicating violations for gender ($F(2, 941) = 4.432$, $p = .036$) and work experience ($F(2, 940) = 6.173$, $p = .002$). Accordingly, the Welch F-test, which is robust against such assumption violations, was employed. The test results showed non-significant differences for gender ($F(2, 941) = 2.57$, $p = .11$), work experience ($F(2, 940) = 1.52$, $p = .22$), school affiliation ($F(3, 939) = 2.21$, $p = .07$), and school size ($F(2, 940) = 0.63$, $p = .53$).

2. Comparison of LH among teachers with different backgrounds

Given that heterogeneity of variance was not observed for LH variable, the Welch F-test was still employed for its robustness and general applicability, particularly useful in guarding against potential Type II errors. In analyzing the data, the Welch F-test in

Table 7 showed no significant gender differences ($F(1, 941) = 0.19$, $p = .66$), and school size effects ($F(2, 940) = 0.74$, $p = .48$). Significant differences emerged for work experience ($F(2, 940) = 4.72$, $p = .01$) and school affiliation ($F(3, 939) = 4.29$, $p = .01$), with further tests suggesting higher scores for those with 1–5 years of experience over those with more than 10 years, and for OBEC or OPEC affiliates compared to BMA.

3. Comparison of SDL among teachers with different backgrounds

The Welch *F*-test for the SDL variable, used in light of Levene's test showing variance homogeneity violations for gender, found no significant differences for gender ($F(1, 941) = 0.04$, $p = .84$), work experience ($F(2, 940) = 1.72$, $p = .18$), and school size ($F(2, 940) = 0.17$, $p = .84$). However, it did reveal significant differences in school affiliation ($F(3, 939) = 2.89$, $p = .03$), with OBEC reporting higher scores than BMA.

Table 6 Comparison of LLM among teachers with different backgrounds

Variables	*n*	*M*	*SD*	S. of V.	SS	df	MS	*F*	*p*
Gender									
Male	188	4.52	0.51	btw gr.	0.56	2	0.56	2.57	.11
Female	755	4.58	0.46	w/in gr.	204.84	941	0.22		
Total	943	4.57	0.47	Total	205.40	942			
				Levene's Test, *F* = 4.432, *df* = 2, 941, *p* = .036					
Work Experience									
1–5 Year(s)	242	4.61	0.43	btw gr.	0.66	2	0.33	1.52	.22
6–10 Years	188	4.53	0.53	w/in gr.	204.74	940	0.22		
> 10 Years	513	4.56	0.46	Total	205.40	942			
Total	943	4.57	0.47	Levene's Test, *F* = 6.173, *df* = 2, 940, *p* = .002					
School Affiliation									
OBEC	251	4.61	0.45	btw gr.	1.53	3	0.51	2.21	.07
OPEC	254	4.57	0.47	w/in gr.	203.87	939	0.22		
LAA	258	4.58	0.45	Total	205.40	942			
BMA	180	4.49	0.50	Levene's Test, *F* = 1.458, *df* = 3, 939, *p* = .224					
Total	943	4.57	0.47						
School Size									
Small	238	4.58	0.47	btw gr.	0.27	2	0.14	0.63	0.53
Medium	270	4.58	0.46	w/in gr.	205.13	940	0.22		
Large	435	4.55	0.47	Total	205.40	942			
Total	943	4.57	0.47	Levene's Test, *F* = .497, *df* = 2, 940, *p* = .609					

Note: *p < .05.

Table 7 Comparison of LH among teachers with different backgrounds

Variables	n	M	SD	S. of V.	SS	df	MS	F	p	Post-hoc Test
Gender										
Male	188	4.33	0.61	btw gr.	0.06	1	0.06	0.19	.66	
Female	755	4.35	0.55	w/in gr.	296.08	941	0.31			
Total	943	4.34	0.56	Total	296.14	942				
				Levene's Test, $F = 2.486$, $df = 1$, 941, $p = .115$						
Work Experience										
1–5 Year(s)	242	4.42	0.53	btw gr.	2.94	2	1.47	4.72	.01*	1–5 Yrs. > 10 Yrs. up
6–10 Years	188	4.37	0.61	w/in gr.	293.19	940	0.31			
> 10 Years	513	4.29	0.55	Total	296.14	942				
Total	943	4.34	0.56	Levene's Test, F= 1.494, df=2,940, p=.225						
School Affiliation										
OBEC	251	4.41	0.55	btw gr.	4.01	3	1.34	4.29	.01*	OBEC > BMA, OPEC > BMA
OPEC	254	4.38	0.58	w/in gr.	292.13	939	0.31			
LAA	258	4.32	0.54	Total	296.14	942				
BMA	180	4.23	0.56	Levene's Test, $F = .460$, $df = 3$, 939, $p = .711$						
Total	943	4.34	0.56							
School Size										
Small	238	4.36	0.55	btw gr.	0.47	2	0.24	0.74	0.48	
Medium	270	4.36	0.54	w/in gr.	295.67	940	0.31			
Large	435	4.32	0.58	Total	296.14	942				
Total	943	4.34	0.56	Levene's Test, $F = .383$, $df = 2$, 940, $p = .682$						

*Note: *p < .05.*

Table 8 Comparison of SDL among teachers with different backgrounds

Variables	n	M	SD	S. of V.	SS	df	MS	F	p	Post-hoc Test
Gender										
Male	188	4.28	0.63	btw gr.	0.01	1	0.01	0.04	.84	
Female	755	4.27	0.56	w/in gr.	308.79	941	0.33			
Total	943	4.28	0.57	Total	308.80	942				
				Levene's Test, $F = 5.511$, $df = 1$, 941, $p = .021$						
Work Experience										
1–5 Year(s)	242	4.32	0.57	btw gr.	1.13	2	0.56	1.72	.18	
6–10 Years	188	4.31	0.63	w/in gr.	307.67	940	0.33			
> 10 Years	513	4.24	0.55	Total	308.80	942				
Total	943	4.28	0.57	Levene's Test, $F = 1.420$, $df = 2,940$, $p = .242$						
School affiliation										
OBEC	251	4.35	0.56	btw gr.	2.82	3	0.94	2.89	.03*	OBEC > BMA
OPEC	254	4.29	0.61	w/in gr.	305.98	939	0.33			
LAA	258	4.25	0.56	Total	308.80	942				
BMA	180	4.19	0.55	Levene's Test, $F = 1.331$, $df = 3$, 939, $p = .263$						
Total	943	4.28	0.57							
School Size										
Small	238	4.29	0.60	btw gr.	0.11	2	0.06	0.17	.84	
Medium	270	4.28	0.58	w/in gr.	308.69	940	0.33			
Large	435	4.27	0.56	Total	308.80	942				
T otal	943	4.28	0.57	Levene's Test, $F = 1.762$, $df = 2,940$, $p = .172$						

*Note: *p < .05.*

Discussion and Conclusion

The discussion will follow the two research objectives. The first part will emphasis the discussion of the level of key mobilizing factors towards LLL. The second part will focus on the comparison results of the three variables among elementary school teachers with different backgrounds.

Levels of Key Mobilizing Factors towards LLL

The research, based on elementary school teachers' perceptions of their behaviors regarding key driving factors towards LLL: LLM, LH, and SDL. The research findings highlight several interesting points that merit further discussion to deepen our understanding and identify areas for future research. The discussion will focus on three key factors that drive teachers' learning behaviors.

Lifelong learning mindset

On average, teachers demonstrate a strong commitment to LLM, with most scoring high (M = 4.57, SD = 0.47, Skewness = -1.08, Kurtosis = 0.82). Interestingly, our findings differ from a study on students conducted by Sproule et al. (2019), where students scored lower (3.84 on 5-level). This variance might be because, in our study, teachers rated themselves, while in the student study, teachers rated their students. Additionally, the teaching profession itself might naturally foster a stronger LLM compared to being a student.

Learning habits

The research findings reveal that the levels of LH among elementary school teachers are quite high (M = 4.34, SD = 0.56, Skewness = -0.57, Kurtosis = -0.26), slightly lower than the levels of LLM, while also demonstrating strong group cohesion. This suggests that teachers largely engage in continuous self-improvement and staying interested in learning, which is really important in teaching profession because the field of education is continually updated or modified to adapt to new educational practices, methods, and technologies.

Self-directed learning

Learning through SDL is an important variable driving LLL. In this study, it was found that teachers engage in SDL at a relatively high level (M = 4.28, SD = 0.57, Skewness = -0.56, Kurtosis = 0.02), and the distribution of scores closely resembles a normal curve. It was observed that the levels of SDL are lower than those of LLM and LH. This may be attributed to the learning process concept proposed by Knowles (1975), upon which this study is based. Elementary school teachers may utilize other learning methods or processes for their self-development instead of SDL. The survey results indicate that teachers employ various learning methods, primarily learning from peers, mentors, and seminars. Consequently, requiring them to adopt SDL for acquiring new knowledge may diminish their inclination towards self-directed learning. Addressing this issue is crucial for devising effective learning strategies to enhance teachers' professional development.

Issues for promoting elementary school teachers' learning

Our study revealed that elementary school teachers exhibit high levels across all three variables, with the highest level observed in LLM. This can be attributed to the inherent requirement of LLL within the teaching profession. However, the reliance on self-reporting in our research design to assess the levels of these mobilizing factors influencing LLL may have led to overrating. To address this possibility, we conducted additional analysis using norm-referenced assessment rather than criterion-referenced assessment. This revealed that the most satisfied group (HHH), characterized by high levels of all key mobilizing factors, and comprises approximately 13.26 percent of the sample, while the most concerned group (LLL) represents 7.32 percent. The moderate group (MMM) accounts for around 34.99 percent.

These findings indicate that promoting teachers to have higher levels of LLM, LH, and SDL may be challenging because the levels of these variables do not develop in a congruent direction. Some variables were initially high in LLM but low in LH or SDL. Finding diverse methods to elevate teachers' levels of LLM, LH, and SDL to a high level uniformly is an issue that requires the development of varied approaches. Although previous research does not provide definitive answers to this issue, our study contributes new insights into LLL development. Continued research studies are essential in addressing this matter. These findings are valuable for stakeholders involved in enhancing the professional development of elementary school teachers, aiming to elevate their levels across all three mobilizing factors.

Based on the survey results and interview data from the supplemental variables, learning strategy preferences and problems in learning of elementary school teachers, it should be noted that teachers used diverse learning methods for their learning and set different learner development goals. That means they have their own learning systems that are not based on self-directed learning. If we believe and trust in the SDL approach, which is appropriate for self-learning development,

subsequent elementary school teacher development should put more efforts on enhancement of this approach.

Another observation is that teachers may engage in self-directed learning but not systematically. Given the heavy workload of teachers, some may not organize learning activities systematically. For whatever reason, since this research adheres to the concept of self-directed learning, promoting teacher learning must proceed accordingly. Therefore, future activity should emphasize SDL, but teachers' time management skills and their continuous self-development should be considered.

One more issue is that affiliated teachers from different organizations focus differently on learner development. For instance, teachers under OBEC (public schools) and OPEC (private schools) focus on academic performance development based on parental expectations and school district area expectations, while those under the Bangkok Metropolitan Administration (BMA) focus on developing student characteristics. Therefore, promoting teacher learning should adhere to learner development goals according to the context of teachers' work practices.

This point is supported by the research findings of Kalin et al. (2017), which found that secondary school teachers are more interested in goal setting than elementary school teachers, but the classroom atmosphere is less conducive compared to elementary school teachers. Additionally, Exline (2022) found that the learner development goals of secondary school teachers focus more on academic performance than holistic student development, as seen in elementary school. Therefore, the fact that teachers in different level of education emphasize different learner development goals can lead to diverse student development. This level of education context, therefore, affects the way to enhance learning habits and self-directed learning of elementary school teachers.

Comparison of Key Mobilizing Factors among Teachers with Different Backgrounds

The teacher backgrounds for the comparisons in the study consist of gender, work experience, school size, and school affiliation. The following discussions are based on ANOVA results.

Lifelong learning mindset

Regardless of gender, experience, or school affiliation, elementary school teachers generally show similar levels of commitment to LLM. This likely stems from the profession's requirement for continuous learning, with most teachers recognizing the importance of ongoing education. Hence, it is not surprising that our study found high levels of LLM among teachers, irrespective of their backgrounds.

However, our study contrasts with another one conducted by Kılıç and Kılıç (2022), which found that female teachers tend to exhibit a greater commitment to LLL than male teachers. Additionally, they found that female teachers are more positive about learning and more motivated to learn and improve themselves. These differences may arise from variations in the groups studied. This underscores the need for further research to understand why different studies yield different results, although such investigation is beyond the scope of this study.

Learning habits

Past studies on teachers' learning habits did not give clear answers. However, our study found that teachers self-assessed themselves as possessing a high level of LH. Interestingly, when comparing LH based on work experience, it was observed that newly employed teachers, with 1–5 years of experience, exhibit higher LH compared to those with 10 or more years of experience.

This discussion relates to the rapid evolution of digital technology, which enables newer generations or teachers to have better digital literacy skills than older ones. With easy access to various learning resources facilitated by digital media, newer teachers can better keep up with educational advancements. Conversely, older teachers may face challenges due to technology-related obstacles that affect their learning abilities. Therefore, the prevalence of digital literacy among newer generations naturally encourages a habit of learning, leading to daily skill enhancement.

Furthermore, the research findings indicate that teachers affiliated with organizations such as OBEC and OPEC, which are mostly provincial or district schools, have higher LH than those affiliated with BMA schools, significant at the .05 level. Interviews with school administrators and teachers affiliated with BMA schools, suggest that some BMA schools may not prioritize academic learning outcomes due to the nature of their student population, which often moves due to parental or job relocations. Consequently, opportunities for continuous student development and further education may be limited in BMA schools. Instead, these schools focus on improving life skills, work skills, or professional skills. As a result, teachers in BMA-affiliated schools prioritize teaching based on their work experience rather than learning new teaching methods. In contrast, teachers in other affiliations feel pressured to emphasize seeking new knowledge to adapt their teaching methods to meet students' academic needs, parental expectations, and school district expectations, thus instilling in them a good learning habit.

Self-directed learning

This research finding on the SDL levels of teachers with different backgrounds is consistent with BAYRAKÇI and

Dindar (2015) findings that gender does not transmit differences in LLL, contradicts Reio and Davis (2005) findings that female learners often have higher readiness for SDL than males, and Demirel et al. (2016), who found that female teachers have higher LLL abilities in some sub-traits compared to male teachers. Inconsistencies in these findings may stem from research sample contexts, methodologies used, necessitating further study. Additionally, this research found that work experience and school size make statistically insignificant differences. Comparisons of these variables have not been clear in past research.

In conclusion, supporting teachers in developing appropriate levels of SDL is essential for promoting effective LLL. Policies aimed at fostering teachers' learning habits and self-directed learning should be prioritized to enhance their understanding and readiness to facilitate student learning. Moreover, emphasis should be placed on empowering and supporting teachers to utilize SDL effectively, ensuring they take control of their learning processes to meet educational objectives. Furthermore, elementary school teachers should be encouraged to become self-learners, rather than solely relying on learning from others. This comprehensive approach to teacher development can significantly contribute to the overall improvement of education quality and student outcomes.

Recommendations

Recommendations for Practices

1. The research has developed measurement tools to assess the main factors of LLL in all three dimensions: LLM, LH, and SDL. These tools are of high quality and are suitable for evaluating teachers in all three dimensions. They can also be used to provide data for promoting the professional development of teachers towards lifelong learners.

2. Approximately 9.54 percent of elementary school teachers need to develop their lifelong learning mindset, which is at low levels. Development also pertains to learning habits and self-regulated learning, which are, on average, lower than lifelong learning mindset.

3. Though, the correlation among lifelong learning mindset, learning habits, and self-regulated learning are at relatively moderate to high level (.72–.87), the levels of these variables do not develop in a congruent direction. The diverse methods to elevate teachers' levels of LLM, LH, and SDL to a high level uniformly is an issue that requires the development of varied approaches.

Recommendation for Further Study

1. Research on issues regarding elementary teachers' LLM, LH, and SDL remains limited in Thailand. Further studies should replicate and confirm the findings concerning the levels of LLM and LH, particularly by comparing these variables among teachers from different backgrounds and school contexts, as the findings from various research studies are not conclusive.

2. The measurement instrument developed in this study should be employed to study secondary school teachers, as the instrument was designed for use by all teachers and is independent of specific teacher contexts. This ensures that its research results could be used to enhance LLM, LH, and SDL for that group.

Conflict of Interest

Fundings

Acknowledgments

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