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Professional Development (PD) as A Predictable Factor Towards Self-Determined Learning (SDL) among Primary School Teachers

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Abstract: The success of Self-Determined Learning (SDL), in general, is typically seen as effective when students are allowed to select their preferred method of learning. The success of SLD is highly dependent on Professional Development (PD) among teachers as it can enhance the quality of pedagogies, instructional technologies, and differentiated instruction approaches that can improve engagement and cater to diverse learners. Several studies have found that poor PD is one of the most critical obstacles to the construction of successful SDL. The purpose of this study is to determine PD dimensions of readiness, planning, training, implementation, and maintenance as predictable factors of SDL and the contribution of PD towards that influences the SDL of primary school teachers. The sample of 382 respondents were involved in this study. Based on the results of the analysis, it was found that the independent variable dimensions of planning, implementation, maintenance, and readiness as a predictor factor account for 24.2% of the change in the dependent variable variant of SDL. In comparison, the other 75.8% was determined by variables not examined in this study. Researchers can then review other factors that affect SDL so that they can find other factors that can influence it.
Keywords: Professional Development, Self-Determined Learning, School Teachers.

1. Introduction

Fostering self-determined learners is a fundamental part of effective pedagogy in today's dynamic educational landscape. Self-determined learning (SDL) facilitates the development of students who will take ownership of their learning. Students who engage in SDL are able to choose the methods by which they learn, set goals for themselves, and are active participants in their own knowledge acquisition. While students must have autonomy in order to engage in SDL, their success utilizing SDL hinges on the ability of well-prepared teachers or educators to work closely with students as they use these skills to reach their goals. This relationship is where professional development (PD) programs for primary school teachers emerge as a predictable factor that supports successful SDL implementation (Artman et al., 2020).

Current educational paradigms emphasize student-centered learning where students are not just passive but active participants as well (Pageh et al., 2024). In many ASEAN education systems, teachers are typically at the center of the learning, with students expected to be passive recipients of information, directly and indirectly, fed by teachers who serve as authorities, often required to memorize the information as it is delivered. With SDL, this changes as students are given the opportunity to become active participants in their own education by choosing learning activities that are meaningful for them, freely asking and answering questions, and working together to explore topics of interest to them and other shifts that are a common-sense but too often radical breath of fresh air in ASEAN education settings where cultural norms often posit the student as someone who should be seen, not heard and respect for authority a premium.

That is not the case with European education systems. Many European countries have long histories of valuing student autonomy and critical thinking, which shows in their education systems. Students are frequently given more leeway in choosing subjects, methods, and even the format of their assessments. European teachers often work more as facilitators and guides, helping students take control of their learning. Here, they employ numerous pedagogies that promote autonomy, like problem-based learning, student-led projects, and differentiated instruction. ASEAN teachers, however, traditionally adopt a more direct and transmissive teaching style. Nevertheless, increasing emphasis on PD is equipping teachers with skills to facilitate and support SDL methods.

Again, this may be because standardized tests are still the dominant form of assessment across ASEAN, with less attention to personalized learning and student reflection. Work is underway to explore alternative assessment approaches that support SDL. Yet improvements are needed to the education system to keep pace with that found in other developing countries. By choosing and independently navigating their own learning paths, students develop self-confidence and a growth mindset, learning to overcome challenges, reflect on their progress, and celebrate successes, building the resilience and adaptability that will be critical for navigating future uncertainties. Nevertheless, unlocking the full value of SDL calls for well-informed and skilled educators. Effective PD programs thus help teachers develop pedagogical practices, instructional technologies, and differentiated instruction techniques that empower students to learn in ways that match their diverse needs and interests (Abulibdeh et al., 2024). This could involve building their knowledge and skills through workshops focused on problem-based learning and project-based learning, as well as digital learning tools, to give students the ability to investigate and learn on their own. They might also reflect on their practice and re-design lessons through coaching and mentoring programs that encourage teachers to rethink their teaching. This shift fosters students' intrinsic motivation and ownership of learning.

Successfully implementing SDL in primary schools requires capable and knowledgeable educators. PD programs act as a powerful tool; if teachers are to become effective facilitators of this transformative learning model, they need the skills and knowledge that a strong PD can provide. It enables teachers to transition from teacher-centered learning to learner-centered. Being an empowering teaching approach, it helps teachers create inclusive as well as personalized learning environments. Besides, teachers may develop 21st-century skills in students. PD contributes to the promotion of skills such as collaboration, communication, problem-solving as well as digital literacy using appropriate inputs. In this way, children will be better prepared for future work and life challenges. In conclusion, effective PD may not only serve as a catalyst for teacher development but also as a means for unlocking the potential of SDL in elementary education. This investigation aims to study the influence of PD on the achievement of SDL success.

2. Objectives

1. To determine Professional Development (PD) dimensions readiness, planning, training, implementation, and maintenance as predictable factors of Self-Determined Learning (SDL) in primary school teachers.
2. To determine the contribution of Professional Development (PD) that influences the Self-Determined Learning (SDL) of primary school teachers.

3. Literature Review

Self-determined learning (SDL) is the exploration of self-study. It is a comprehensive strategy for enhancing learner capacities and a condition for the realization of autonomy (Moore, 2020). Such a system recognizes that the learner is the primary agent in the learning process. Underpinned by Thorndike's law of effect, the self-determined learner is an active and proactive participant whose experiences inform the pursuit of their learning (Schweder & Raufelder, 2024). As with the andragogic learning approach, in the SDL paradigm, instructors are viewed as facilitators who provide guidance and resources to learners while allowing them to determine the direction of their learning. Accordingly, to the extent that learners have control over what to learn and how to learn it, learning is controlled by them.

(Schweder & Raufelder, 2024). SDL represents a mature and holistic educational approach, necessitating a fundamental shift in the traditional teaching and learning landscape. It is a place that emphasizes fostering lifelong learning competencies through active engagement and proactivity, thereby positioning learners at the forefront of their educational experiences, rooted in personal exploration.

In the contemporary context, SDL emerges as a compatible educational framework imperative for cultivating lifelong learners capable of navigating the complexities of the global economy. However, this specific SDL approach is unlikely to achieve success in the absence of educator collaboration. Hence, educators must enhance their professional readiness, necessitating continuous upgrading and updating to incorporate an effective SDL learning approach. They need to enhance their professional competence and engage in ongoing self-development endeavors.

The value of PD is well documented in the educational literature. Darling-Hammond (2017) pointed out that effective PD is not a set of one-shot workshops but rather a training process that is continuous and personalized to align with the individual needs of teachers. For primary school teachers, Darling-Hammond and McLaughlin (2017) noted that teachers need ongoing opportunities to learn subject matter deeply and to develop pedagogical skills that increase with practice and feedback. These studies, as a whole, note the evolution of the teaching profession, showing range in how teachers must continually learn to reach the diverse needs of the growing population of students. Teacher's PD has been widely recognized as a major consolidator of improved teaching

practices and student outcomes. However, within the framework of primary education, where learners' lifelong learning is formed, the perpetuation of teachers' continual development becomes more substantial and, perhaps, obligatory.

There has been no shortage of research underscoring the critical role of teacher PD in elevating the quality of instruction and, by extension, student achievement. Darling-Hammond (2017) writes that effective PD is not an identical process for every educator but involves personalized, ongoing efforts tailored to the needs of the individuals. Moreover, Ingersoll and Strong's (2011) research confirms this, finding that the more a teacher participates in high-quality PD, the greater the student achievement. Teacher PD is a building block in the continuing pursuit of educational excellence. Its significance is two-fold: it does not only impact the individual educator but also the broader instructional environment and, ultimately, the student learning outcomes.

Teacher professional development is, first and foremost, a means for educators to remain abreast of the latest and best pedagogical techniques, technological advancement, and educational research. Continuous learning in an ever-evolving educational landscape ensures that teachers are well-equipped to meet the diverse needs of their students. When this continuous learning is rooted in reflective practice, it turns educators into drivers of the process of refining and focusing their teaching methods, fostering essential qualities such as resilience, self-efficacy, and adaptability in the face of the rapidly evolving challenges they face on a day-to-day basis within the dynamic classroom environment. PD that is aligned with school goals and executed under effective leadership creates a collaborative learning community whereby teachers not only enhance their skills as individuals but also contribute to a collective synergy that raises the bar for the overall educational experience within the building in question and beyond.

All in all, the importance of teacher professional development particularly lies in its ability to empower educators, enhance the quality of instruction, and create a ripple urging at the heart of effective and transformative teaching practices. As previously stated, the effective implementation of the SDL approach necessitates the heightened PD of educators. Schools and educational organizations should provide resources, time, and collaborative opportunities for teachers to engage in various teacher professional development activities to make the SDL approach successful in the classroom. In principle, the professional integration of primary school teachers towards a harmonious SDL approach has the potential to create a more adaptive, informative, and innovative educational landscape. Therefore, there are five main dimensions that need to be focused on in PD among primary school teachers. Wood et al. (1993) introduced the Professional Development Model of Readiness, Planning, Training, Implementation, and Maintenance (RPIM) after identifying five interrelated levels in school professional development.

Readiness

This crucial phase revolves around fostering a deep understanding of the rationale behind PD. By exposing teachers to the potential of PD to elevate their teaching practices, student outcomes, and overall school effectiveness, a growth mindset is nurtured (binti Musa & Jamil, 2023). Tailoring PD opportunities to individual needs and interests further enhances relevance and motivation, encouraging active participation (Sangiuliano Intra et al., 2023). Notably, the shift from passive awareness to active engagement is emphasized. This translates to a willingness to participate in structured activities like workshops, collaborative learning communities, or online coursesesigned to equip educators with the necessary knowledge and skills (Ealangov, 2023). However, mere participation is not enough.

The key lies in cultivating intrinsic motivation, where educators can connect PD to their personal goals and values, fostering a sense of ownership and purpose. This intrinsic drive fuels sustained engagement, ensuring the self-improvement journey does not fizzle out with the initial spark. While expanding the knowledge base and augmenting skill sets are undoubtedly crucial aspects of PD, it is essential to acknowledge the development of attitudes and dispositions as well. These play a significant role in shaping teaching practice, and their development deserves equal attention (Aulia, 2023). Ultimately, the success of the Readiness stage hinges on strong leadership and a supportive school culture that values professional growth (Wang et al., 2023). By effectively creating this fertile ground, schools can empower their staff to embark on journeys of continuous learning, leading to improved teaching practices and, ultimately, student success.

Planning

Within the dynamic Professional Development Model, the Planning phase emerges as a keystone, meticulously crafting the roadmap for educational transformation (Kolesnik et al., 2023). This collaborative endeavor brings school staff together, their minds abuzz with shared aspirations and a resolute dedication to translating desires into concrete action. Hence, meticulous plans are formulated, each meticulously tailored to address the school's unique needs and pave the way for the intended improvements in educational management (Oghly, 2023). A defining characteristic of this phase is the active involvement of staff in shaping the intricate details of the plan. This participatory approach fosters a sense of ownership and investment, ensuring that the plan resonates with the

lived experiences and perspectives of those who will translate it into action (Fullan, 2007). At the heart of this collaborative effort lies the easy establishment of the school's vision and mission. These guiding principles serve as the North Star, illuminating the path toward the collective vision of educational excellence. The vision, capturing the school's aspirations for its educators and their impact, ignites a flame of inspiration (Song et al., 2023)

Like a beacon, it illuminates the desired future state, where teachers thrive and cultivate exceptional learning experiences. The mission, translating those aspirations into tangible action, serves as the practical compass. It outlines the core values that guide teachers' journeys and the strategic pathways that empower them to achieve their full potential in developing their professional (Smith & Gillespie, 2023). Together, Vision and Mission provide a clear sense of purpose and direction, propelling teachers forward on their continuous development journey. Beyond mere aspirations, the Planning phase delves into the strategic articulation of the desired transformations. Staff members critically analyze current practices, identify areas of need, and develop interventions designed to meet those needs based on the data. Furthermore, the data-driven process, based on research and best practices, provides evidence to guarantee that the plan will work and be as effective as possible (Polenghi et al., 2023)

The Planning phase success resembles the effective leadership. In the present day context, effective school leadership means the facilitation of required collaboration to make planning work, the creation of a climate of collegiality and trust characterized by open communication, and hearing the voice of every member of the community and valuing it (Candrasari et al., 2023). By consistently directing, guiding, and supporting, leaders also serve to empower staff to enable them to shout out their dreams from the mountaintops to their targeted audiences. The Professional Development Model's Planning phase is as legendary in overall importance as all other phases. Through collaborative planning and meaningful participation by staff, a clear vision and mission have been established, and the stage has been set for a successful, sustainable transformation of the education experience. The detailed roadmap through which this transformation is planned represents the Planning phase's gift to a school community as it begins its journey toward excellence.

Training

Next is the training phase, which is putting plans into action. The Training stage occupies a pivotal position within the PD cycle, transforming the well-laid plans of the previous stage into tangible action. This crucial phase serves as the bridge between theory and practice, where the seeds of envisioned transformations are sown within the fertile ground of the teaching faculty (Vaz & Baptista, 2023). Here, the focus shifts from conceptualization to operationalization. Internal training sessions take center stage, their primary aim being to foster the professional growth of teachers. These sessions function as vessels for translating abstract concepts and strategic blueprints into actionable initiatives, each meticulously tailored to enhance the competencies and expertise of educators (Fullan, 2007).

The key to success lies in alignment. Each activity and training program is strategically designed to mesh seamlessly with the predetermined objectives established in the planning stage. This ensures a coherent and synchronized approach, where every intervention contributes to the overarching goal of bolstering the professional capabilities of teachers (AlGerafi et al., 2023). Through targeted training interventions, educators engage in a journey of continuous learning and development (Abulibdeh et al., 2024). They discover new knowledge, improve their skills, and learn effective best practices within the framework of particular domains. Such an approach serves as a way to encourage teachers to accept innovations and, therefore, to improve teaching and promote student performance.

Nonetheless, the Training stage is not organized for knowledge transfer only. It is organized for active participation and engagement (Demir et al., 2023). It means that its participation may include effective and productive collaborative learning, peer coaching, or well-organized practice application. In this case, the acquired knowledge will be successfully transferred into the new practices, leading to improved and efficient teaching in the classroom (Herro et al., 2022). Moreover, it is all about proven implementation, monitoring as well as evaluation. In the evaluation of the training efforts, educators and their leaders can examine the newly trained personnel's efficacy, adjust and implement these efforts even better for more drastic improvements (Kilag et al., 2024). In other words, it is at the Training stage that the robustness of the PD process unfolds. It is where well-designed and implemented training interventions equip educators as change agents who transform the chances for themselves and their learners toward a trajectory to an excellent educational future.

Implementation

The implementation stage represents a critical point on the PD trajectory because it is here that best-laid plans are realized in the school's operating system (Watson, 2023). This essential phase closes the chasm between theory and practice, where the seeds of imagined change are sown into the fertile ground of classroom life. Picture the Implementation stage as the symphony that plays the carefully crafted music from the Planning stage (Zhang,

2022). At this school, carefully constructed training programs merge seamlessly with the school's organizational system, as noted by (Alkaabi et al., 2022). Through the intentional enactment of these planned activities, teachers engage experientially in their learning as they actively participate in new knowledge and skills to build their professional knowledge base for practice.

Benefitting from good intentions takes more than educators wanting to improve. Deploying resources effectively requires a systematic approach. Educators need to be provided with the tools, materials as well as opportunities to translate their new knowledge and skills into daily practice (Cannone et al., 2023). The deployment includes access to technology and materials but also to the time, space, coaching, mentoring, and continuous learning to hone new practices on an ongoing basis. Additionally, creating the right culture is important. A culture conducive to learning is one in which experimentation, reflection as well as feedback are expected in which educators feel safe to step out of their comfort zones. Psychological safety is an important concept (Tang et al., 2020). Through creating a sense of psychological safety and open communication, leaders make sure that educators feel confident to take on new challenges and to reflect on both their successes and failures.

Indeed, the objective of the Implementation phase is to embed PD activities in the operational fabric of the school, moving from individual to group activities (Metz et al., 2020). It assumes the movement from episodic to continuous teacher learning, facilitated by a fostering environment and the integration of learning and innovation in the fabric of the organization and its purpose for educators and students (Rahiman & Kodikal, 2024). Naturally, the journey does not end at initial implementation.

Monitoring and evaluation are critical, fuelling ongoing improvements to PD initiatives through ongoing evaluation of the efforts. Continuous improvement and adaptation, the core spirit of formative assessment, is the fulcrum on which both educators practice and students learn (Downer et al., 2024). In ultimate summation, The Implementation stage is where the promise of PD turns into proof-in-practice. By strategically deploying talented resources, creating supportive environments where they can thrive, and fostering a culture of learning, agencies of change emerge, and the quality of teachers' and students' learning improves.

Maintenance

The Maintenance stage is a critical element of the professional development continuum since this is the stage where individuals work to go from new knowledge to sustained impact. The thrust at this point is on ingraining the practices from PD initiatives, weaving them into the cultural fabric and developmental mindsets of the school environment.

During the Maintenance stage, knowledge and skills developed in the earlier career stages are actively applied and further established, leading to sustained competence and growth. This stage represents what might be termed a phase of solidification and adaptation, whereby previously acquired competencies are honed, and new challenges are confronted (Rudman et al., 2024). Therefore, the focus now veers away from the acquisition of innovative skills to the embedding of those skills. The data, skills, and strategies yielded through PD activities are inculcated into the mainstream operational ethos of the school, helping to ensure that these remain there in perpetuity (Timotheou et al., 2023). This inculcation is diffuse in that it spreads out throughout the organizational landscape. Thus, established practices yielded from PD initiatives are melded into the everyday cultural norms of the school, impacting expectations, interactions, and professional routines (Casanova et al., 2023). This engenders a culture of sustained PD, in which ongoing inquiry and growth become an inherent part of the school ecosystem.

These practices create a self-perpetuating cycle for improvement and innovation. The acquisition and application of knowledge and skills eventually affect student learning (Obee et al., 2023), resulting in the maintenance stage, or a long-term process of continuous critical thinking and reflecting. This cycle creates an environment that is conducive to growth for teachers and students as they move the culture of the school toward a vision of educational excellence (Obee et al., 2023). Nevertheless, maintenance relies on more than compliance behaviors. Active engagement is essential, and leadership and action are needed to facilitate a nurturing environment for experimentation, collaboration, and reflection within the school (Alam, 2023).

Leaders empower educators to champion and refine the newly adopted practices by providing ongoing guidance, feedback, and opportunities for professional dialogue. Monitoring and evaluation are also essential components for sustained impact. Regularly assessing the effectiveness of implemented practices enables educators and leaders to pinpoint areas of improvement and refine their approach for greater efficacy (Zamiri & Esmaeili, 2024). In conclusion, the Maintenance stage represents the culmination of the PD journey. The pure transformative intensity of PD can happen by deliberately infusing new practices into the cultural fabric of the school and a constant yearning for learning and upgrading. This step enables educators to play a more active agent of change, one that can shift the learning ecosystem into a space of vibrant, vibrant, thriving student-centeredness for all. This phase of the exploration revealed a powerful convergence between SDL and effective PD for primary school educators.

As the understudies crusade and assume responsibility for their own training, SDL is simultaneously elaborating, however, just on the off chance when instructors are outfitted with new information, abilities, and requirements. In conclusion, the five-stage Professional Development Model is a helpful instrument to facilitate this change. This includes Readiness, Planning, Training, Implementation as well as Maintenance. From developing a growth mindset at the Readiness stage to designing targeted training in the Training stage, each step of the plan becomes a foundation stone that supports the integration of SDL. However, the role of the Maintenance stage, which is beyond integration, is even more crucial for the process of sustaining the knowledge and skills received. During this phase, the elements of self-directed learning are integrated into the school's cultural and organizational framework, creating a setting for constant growth and improvement. School administration and leadership play a key part in this process as they have to support, guide, and reflect on the change on a regular basis. Essentially, the success of SDL rests on the strategic empowerment of educators as agents for change. Effective PD, framed by the Professional Development Model and driven by a shared vision for transformative learning, provides educators with the tools and mindsets to create classrooms that are dynamic, student-centered learning environments where self-determined learners prevail.

4. Methodology

This study used the quantitative approach. As posited by Babbie (2021), survey methodologies can offer accurate measurements, generalisability, and flexibility. In this study, the primary data collection tool employed was the questionnaires. A total of 382 respondents participated in this study, selected by using the sampling method of Krejcie dan Morgan (1970). This study used PD and SDL instruments to obtain information from primary school teachers from all over the country. Data is collected through direct dissemination to the respondents' schools and via Google Forms. A stratified random sampling method by zone and state was used in stages, including demographic information obtained.

Stepwise Multiple linear regression analysis was conducted in this study to see the most significant contribution or influence of an independent variable on the dependent variable. The research variables include the independent variable and the dependent variable, which can seen in Table 1. For more details, the schema of the variable's relationship is shown in Figure 1. The independent variables that were studied were entered with a stepwise method to determine the relative contribution of each independent variable to the dependent variable. Multiple linear regression analysis is a linear regression to analyze the contribution of the relationship and influence of independent variables whose sum is more than two.

Table 1: Research Variables

Variables	Dimensions
Professional Development (PD)	Planning (PPP)
	Implementation (PPI)
	Maintenance (PPM)
	Readiness (PPK)
	Training (PPL)
Self-Determined Learning	

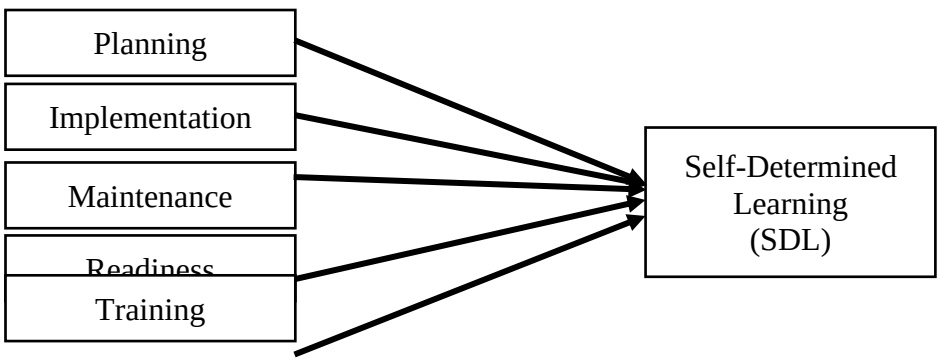


Figure 1 Variable Dimensions Relationship Diagram

Data collection was carried out by distributing questionnaires to respondents. The data analysis technique uses two techniques, namely descriptive analysis to describe the percentage of respondent frequency and stepwise multiple linear regression analysis to explain the predictable factor of SDL and the contribution of PD that influences the SDL of primary school teachers. Due to the data used in the ordinal scale questionnaire, the data must be transformed into interval data to fulfill the stepwise multiple linear regression test requirements. Thus, ordinal data is transformed into intervals using the IBM SPSS 24.

5. Research Finding

Sociodemographic Profile of the Participants

The demographic breakdown of the frequency and percentage of respondents to this survey is shown in Table 2. Based on the consequences of the study, of the 382 respondents who were sampled in this study, 192 (50.3%) respondents were from SK, 110 (28.8%) respondents were from SJKC, and 80 (20.9%) respondents of them were from SJKT. The overall number of replies from males was 104 (27.2%), compared to the total number of responses from females, 278 (72.8%). Most respondents were between 40 and 49 years old, which is a total of 139 (35.6%). Furthermore, for the aspect of experience in teaching, most of the respondents consisted of 83 (21.7%) respondents who had teaching experience for 16 to 20 years.

Table 2: Respondent Profile

Item	Category	Frequency	Percentage (%)
Type of School	SK	192	50.3
	SJKC	110	28.8
	SJKT	80	20.9
Gender	Male	104	27.2%
	Female	278	72.8%
Age	20 – 29 years	40	10.5%
	30 - 39 years	129	33.8%
	40 - 49 years	139	35.6%
	50 years and above	77	20.2%
Teaching Experience	≤ 5 years	31	8.1%
	6 - 10 years	61	16.0%
	11 - 15 years	67	17.5%
	16 - 20 years	83	21.7%
	21 – 25 years	82	21.5%
	≥ 25 years and above	58	15.2%
	Total	**382**	**100%**

Descriptive Data at the Variables Measured

Next, descriptive statistics are conducted to provide a comprehensive overview of the data distribution for each variable in this study. Descriptive statistics used to analyze the data of this study are mean and standard deviation values. This analysis is used to measure the level of a teacher's PD and SDL. Table 3 shows the findings of the descriptive analysis.

Table 3: Descriptive analysis of Variables

Variables	Mean(M)	Std Dev (SD)
Professional Development (PD)	8.55	.811
Self-Determined Learning (SDL)	8.63	.736

Based on Table 3 above, the mean score describing the overall PD level among primary school teachers is high (M=8.55, SD = .811). Meanwhile, the level of SDL is also high (M=8.63, SD = .736). With a score of 8.63, the means for primary school teachers' SDL demonstrates greater means than PD. The average and standard deviation for the two variables, however, indicate that primary school teachers have a high level of PD and SDL pedagogical approach.

Table 4 shows the analysis of the PD variable, which is professional development for planning (PPP), implementation (PPI), maintenance (PPM), readiness (PPK), and training (PPL). The results of the analysis show that training among primary school teachers has the highest mean of 8.74, while planning and implementation shows a slightly lower mean value of 8.44.

Table 3: Descriptive analysis of Variables

Variables	Mean(M)	Std Dev (SD)
Planning (PPP)	8.44	1.10
Implementation (PPI)	8.44	1.22
Maintenance (PPM)	8.58	1.05
Readiness (PPK)	8.60	1.09
Training (PPL)	8.74	1.00

Self-Determined Learning Predictors

Table 4 shows an analysis of planning, implementation, maintenance, readiness, and training as the predictable factors of SDL in primary school. The finding shows that planning, implementation, maintenance, and readiness have significant beta (β) values as predictors. This means that each of these dimensions explained the variance on SDL after the influence of the other variables was statistically controlled through stepwise multiple linear regression analysis. However, dimension training does not predict SDL. All the predictable factors were included in the regression model because these variables had β values that were strong values and insignificant after the influence of other variables was controlled.

Table 4: The Beta Values of Self-Determined Learning Predictors

	Beta	Sig.	t -Value
Planning	.193	.000*	3.515
Implementation	.141	.012*	2.533
Maintenance	.135	.013*	2.506
Readiness	.127	.018*	2.385
Training	.073	.192*	1.308

Note: Significant at level * $p < 0.05$

Table 5 shows the contribution of planning, implementation, maintenance, and readiness as predictable factors of SDL in primary school. The independent variable PD dimension of planning, implementation, maintenance, and readiness as a predictor factor accounts for 24.2% of the change in the dependent variable variant of the SDL approach in primary school.

Table 5: Multiple Regression of Self-Determined Learning Predictors

Model	R	R Square	Adjusted R Square	Significant
P1	.395[a]	.156	.154	.000
P2	.455[b]	.207	.203	.000
P3	.477[c]	.228	.222	.002
P4	.492[d]	.242	.234	.008

a. Predictors: (SDL), PPP
b. Predictors: (SDL), PPP, PPI
c. Predictors: (SDL), PPP, PPI, PPM
d. Predictors: (SDL), PPP, PPI, PPM, PPK
e. Dependent Variable: SDL

Table 6: Linear Regression Predictor of Self-Determined Learning

Model	R	R^2	$\hat{R}^2$	df	F	Sig.
(Constant)	.395[a]	.156	.154	1	70.142	.000
Planning				380		
				381		
(Constant)	.455[b]	.207	.203	2	49.533	.000
Planning				379		
Implementation				381		
(Constant)	.477[c]	.228	.222	3	37.135	.002

Planning				378		
Implementation				381		
Maintenance						
(Constant)	.492[d]	.242	.234	4	30.068	.008
Planning				377		
Implementation				381		
Maintenance						
Readiness						

Constant : *Self-Determined Learning* ***Note:*** *Significant level at* $p < 0.05$

The results of the stepwise multiple linear regression analysis in Tables 6 and 7 show that the change in the four variables included in the regeneration model follows a significant β value. Planning (β=.395, p<0.5) significantly contributed as much as 15.6% (R^2=.156) changes in variance [F (1, 380) = 70.142, p<0.5] of SDL. The combination of Planning (β=.292, p<0.5) and Implementation (β=.249, p<0.5) contributed 20.7% (R^2 =.207) changes in variance [F (2, 379) = 49.533, p<0.5] of SDL.

The combination of Planning (β=.253 p<0.5), Implementation (β=.185, p<0.5) and Maintenance (β=.167, p<0.5) contributed 22.8% (R^2 =.228) changes in variance [F (3, 378) = 37.135, p<0.5] of SDL. The combination of Planning (β=.209, p<0.5), Implementation (β=.158, p<0.5), Maintenance (β=.147, p<0.5) and Readiness (β=.140, p<0.5) contributed 24.2% (R^2 =.242) changes in variance [F (4, 377) = 30.068, p<0.5] of SDL. The regression equation is given as follows: $Y = 4.970 + 0.139_1 + 0.095_2 + 0.103_3 + 0.094_4$

Table 7: Coefficient Values Self-Determined Learning Predictors

Model	Variable	B	Std. Error	Beta	t
P1	(Constant)	6.419	.267		24.082
	Planning	.262	.031	.395	8.375
P2	(Constant)	5.733	.293		19.546
	Planning	.194	.033	.292	5.804
	Implementation	.150	.030	.249	4.957
P3	(Constant)	5.268	.325		16.209
	Planning	.168	.034	.253	4.946
	Implementation	.111	.032	.185	3.451
	Maintenance	.117	.037	.167	3.161
P4	(Constant)	4.970	.341		14.555
	Planning	.139	.035	.209	3.919
	Implementation	.095	.033	.158	2.915
	Maintenance	.103	.037	.147	2.768
	Readiness	.094	.035	.140	2.660

Constant : Self-Determined Learning ; P=Predicable Variable

Chart 1: Histogram

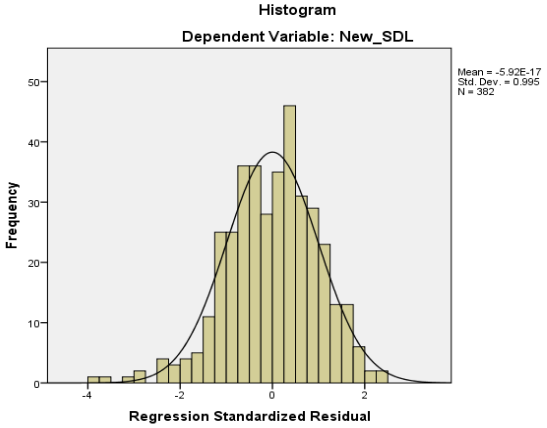
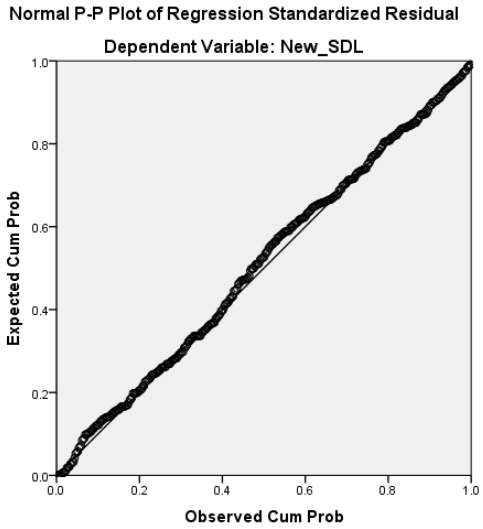


Chart 2 : Normal P-PPlot of Regression Standardized Residual



Added here are charts 1 and 2 to provide more evidence for the analysis. Based on the analysis of this study, it was found that there are four factors that contribute to SDL, namely planning, implementation, maintenance, and readiness. Among the factors that make the main contribution is planning, followed by implementation, maintenance, and readiness. This study can also reveal that the four dimensions of the PD variable contributed to as much as a 24.2% change in the variance of SDL. The findings also reveal that there are other factors that affect SDL.

6. Discussion and Conclusion

The purpose of this research was to determine the predictive contribution of PD dimensions of readiness, planning, training, implementation, and maintenance as predictable factors of SDL in primary school teachers. The current study demonstrated that PD dimensions of planning, implementation, maintenance, and readiness were capable of contributing 24.2 % of the variance in the SDL approach in primary school. The current findings support the important premise that well-designed and well-executed PD can play a significant role in endorsing SDL practices among primary school teachers. Koster et al. (2008) claim this is indeed the position, citing that teachers who are voluntarily involved in a wide range of professional development activities, including online courses, attending workshops, conferences, or engaging in self-investigations, can set goals for their professional development. With such a system in place, teachers are capable of designing their own learning curriculum by selecting teaching topics, teaching methods, and resources that align with the teacher's goals and encourage SDL practice more frequently in the classroom.

To sum up, PD dimensions of planning, implementation, maintenance, and readiness contribute significantly to the growth of SDL. The 24.2% variance of SDL suggests that PD can provide teachers with the knowledge, skills, and motivation to espouse the principles of SDL. The current investigation, therefore, points to the likelihood that effective PD programs can facilitate school teachers' orientation toward SDL primary schools, which are the root of the educational system. Therefore, schools are encouraged to take a more proactive approach to addressing this. They should provide intentional time for teachers to think about, receive input, and make changes to their new and developing practice. According to Darling-Hammond et al. (2017), meaningful PD programs require time for implementation. One-off workshops are more likely to fail if their main purpose is to change practice. Therefore, we suggest that programs should be held over a sustained period, offering multiple opportunities for teachers to engage in learning. Mastering pedagogical practices among teachers will produce positive and empowering teachers.

The results of the study also show that one of the dimensions of PD, which is training, does not contribute to SDL. Although traditional teacher training can provide valuable knowledge, it often faces criticism for being too teacher-centric, offering a one-size-fits-all approach, and having a short-term focus. This means it may prioritize lectures and workshops over active skill development, fail to consider the needs of individual teachers and diverse

student populations, and deliver a temporary burst of knowledge that struggles to translate into long-term implementation of effective practice.

Backing teachers for successful SDL means departing from outdated training methods. Here are some impactful approaches. Liberating teachers for successful SDL requires rethinking outdated training models. For example:

- **Mentorship**: Pairing newbies with veterans can help ensure ongoing support and provide a safe space for customized feedback, as well as getting SDL to work effectively in people's individual classroom realities.
- **Collaborative Learning**: Building vibrant communities where teachers can share best practices, collaborate on resources, and brainstorm their challenges can generate the collective genius that can be turned into ongoing innovation.
- **Action Research:** Encourage teachers to experiment with different SDL strategies and foster an inquiry-sharing spirit among the educators. As the teachers discuss their successes and failures with their colleagues, they contribute to the development of a common understanding of what tenets of SDL work. With time, each teacher fine-tunes their approach to be more successful in implementing SDL.
- **Technology-Integrated Resources**: Rely on online platforms, simulations, and modules with which teachers can work in their free schedule time and which can be adjusted to their learning style and current needs.
- **Long-Term Commitment:** Show a consistent level of funding, free time in the teachers' schedules to try the new approach, and all the ways to let the teachers see how good their job is. The essential thing is to create a balanced atmosphere in which SDL can flourish for the benefit of the teachers and their students in the future.

By embracing these strategies, teachers will be well-equipped to navigate the ever-evolving world of SDL and realize its potential for the transformation of teaching and learning. Furthermore, nurturing the self-determined learner also demands a paradigm shift, i.e., moving away from teacher-centered instruction and toward encouraging students to take control of their learning. Quality professional development can lead the way in equipping educators with the strategies and tools they need to foster autonomy, competence, and relatedness in learning. This might include exploring models like Self-Determination Theory (SDT), trying out differentiation and student-led projects, or incorporating metacognitive and self-assessment techniques. By investing in professional learning opportunities centered around SDL, we can arm educators with the skills to create classrooms where they are developing intrinsically motivated, lifelong learners who are prepared for success beyond the walls of the classroom.

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