Knowledge Management in Education: Developing a SECI-based Model of Phronetic Leadership for the Department of Education in Northern Philippines

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ABSTRACT

Background and Objectives: Educational leadership is essential, and involving stakeholders in a collaborative knowledge creation process promotes innovation, which in turn enhances both student achievement and overall school performance. This study aimed to assess the awareness and understanding of school leaders about phronetic leadership (PL). Moreover, the study sought to develop a knowledge and management model for the Department of Education (DepEd) in Ifugao, Northern Philippines. This utilizes the socialization, externalization, combination, and internalization (SECI) model of PL from the perspectives of school leaders and teacher representatives.

Methodology: This study employed a mixed-methods approach, beginning with a quantitative survey of 151 school leaders from the DepEd. The questionnaire was pilot tested with 50 respondents, achieving a reliability score of 0.90. An intervention involving an action-oriented extension project focused on capacity building was organized for 130 DepEd administrators and teacher representatives after the survey. Following the workshop, a qualitative method was employed, involving a focus group discussion (FGD), which was conducted with 11 key representatives. The percentage method was used to evaluate respondents' awareness and understanding of PL. Thematic analysis was applied to interpret the qualitative data. Ethical standards were upheld through informed consent, voluntary participation, and confidential, anonymized responses.

Main Results: Few respondents participated in capacity-building activities, or had any awareness or in-depth understanding of PL. The data revealed a low level of exposure and engagement among leaders. This highlights a gap in the understanding and demonstration of PL skills, which has the potential to limit the effectiveness of school leadership. There was no existing knowledge management model for the DepEd; however, a model based on the SECI process of PL was developed through the FGD conducted after the survey.

Discussions: The gap in awareness, understanding, and capacity regarding PL highlights the challenges faced in advancing leadership practices within educational institutions and emphasizes the importance of empowering school leaders in this area. Improving knowledge in educational management boosts organizational efficiency and effectiveness. School leaders can gain valuable insights that enhance their decision-making, particularly in situations that necessitate a thorough understanding of the context and a

ARTICLE INFO

Article history:
Received 18 March 2025
Revised 13 November 2025
Accepted 14 November 2025

Keywords:
Tacit,
Explicit,
Phronetic leadership,
SECI model,
Basic education

comprehensive evaluation of all relevant pros and cons expressed by stakeholders. Therefore, it is highly recommended that leaders establish a framework, in collaboration with stakeholders, that promotes knowledge development based on the SECI model. The cycle of socialization, externalization, combination, and internalization, which are the key elements of the knowledge creation model continues.

Conclusions: School leaders show limited awareness, understanding, and involvement in capacity-building seminars on PL. This lack of engagement reduces the overall effectiveness of school leadership in implementing this approach. The combination of tacit and explicit knowledge creates valuable resources, supporting the continuous development of policies, teaching strategies, instructional materials, records, and various databases. Implementing the knowledge management framework, developed by DepEd leaders, is highly advantageous. Ongoing improvement in organizations occurs when they formalize, through policies, a contextualized knowledge management model based on the SECI dynamics, which were designed by stakeholders themselves to meet their needs and those of the industry. The cycle continues through feedback mechanisms.

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Introduction

Quality educational leadership enables direction, innovation, teamwork, decision-making, and the development of environments that support the achievement of goals. Various internal and external stakeholders play an active role in promoting the creation of new knowledge and enhancing educational practices, policies, and strategies in the management of schools or other organizations. When stakeholders in schools share their ideas, perspectives, experiences, and expertise, it leads to more creative concepts that contribute to the development of relevant and effective curricula, research, community services, and improved learning outcomes. Ruoslahti (2020) disclosed that the involvement of various stakeholders during the entire course of a project is important. The findings of their study suggested that complexity plays a significant role in the collaborative creation of knowledge within innovation initiatives in various ways.

Knowledge arises from the integration of thoughts and behaviors of people who engage with one another both inside and outside the limits of the organization (Nonaka & Toyama, 2005). Organizations aim to develop new knowledge in order to stay competitive (Henderson & Clark, 1990). Ganguly et al. (2020) suggested that managers should specifically consider how knowledge management frameworks can ensure that top-notch knowledge is accessible throughout the organization. They demonstrated that knowledge quality has a significant impact on an organization's capacity for innovation. The capability to generate and utilize knowledge resources serves as a crucial competitive edge for organizations (Alavi & Leidner, 2001). The collaborative generation of knowledge within organizations fosters innovation and transformation. Knowledge plays a vital role in supporting an organization's ability to innovate (Ahuja & Katila, 2001). Initiatives focused on knowledge co-creation can help make innovation more democratic (Kreiling & Paunov, 2021). Ruoslahti (2020) suggests that the co-creation of knowledge in innovation projects is characterized by complexity in multiple aspects. The

results of Prentice et al. (2025) illustrate notable connections between organizational welfare and knowledge sharing, as well as between knowledge sharing and employee well-being. One type of knowledge is tacit knowledge, which is implicit, instinctive, less expressed, and exists within individuals (Polanyi, 2012). Tacit knowledge is gained through informal conversations in settings where individuals gather existing knowledge within a "ba," which signifies a space for knowledge generation. The “ba” can be found in any place where knowledge may develop among people, such as in committees, task forces, individual emails, chat groups, project teams, and so on (Nonaka & Toyama, 2003). Explicit or encoded knowledge is information that can be shared through communications, manuals, records or databases.

In the realm of educational management, the generation of knowledge depends on the leader's capacity to cultivate a collaborative atmosphere where officials, educators, parents, staff, community members, and various stakeholders actively engage in sharing and enhancing knowledge. This leads to new developments in the school, teaching and learning methods, curriculum design, research, community services, partnerships, and educational outcomes.

Phronetic leadership (PL) involves applying pragmatic wisdom that supports the socialization, externalization, combination, and internalization (SECI) dynamics. Phronetic leadership emphasizes the values and moral purpose that are central to effective leadership in establishing and achieving a strategic vision, ultimately making the world better (Flyvbjerg, 2001). Cheng (2024) found that using the SECI model to empower pre-service teachers led to notable improvements in reflection, rationalization, and the effective creation and utilization of tacit knowledge. Gonzales (2024) disclosed that SECI-based models for leadership were developed for university governance, student leadership, and instruction based on the perspectives of leaders, faculty representatives, and student leaders. The SECI model illustrates the switching process through a continuous dialogue between tacit and explicit knowledge (Nonaka, 1994). Amid the changing realm of education, the SECI model, as explained by Nonaka et al. (2000) offers an organized approach for converting tacit knowledge into explicit knowledge, thus promoting a vibrant organizational atmosphere. Ideas are shared in a temporary locus, or “ba,” as mentioned earlier. In the *socialization* phase, tacit knowledge is exchanged through informal conversations among individuals who have acquired different tacit knowledge through direct experiences. Beginners in organizations learn the tacit knowledge needed in their jobs through hands-on routines and close interactions over time (Nonaka & Toyama, 2003). The tacit knowledge is converted into explicit knowledge in the *externalization* phase, resulting in new explicit knowledge in the form of concepts, patterns, images, and documents. The tacit knowledge is expressed through meetings, discussions, dialogues, participation, and consultations. New ideas are generated in the process, and what individuals will learn from their work or life allows for the emergence of new models or ideas, which may benefit their colleagues and the workplace (Nonaka et al., 2006). The explicit knowledge is pooled with existing explicit knowledge in the *combination* phase to form complex and systematic explicit knowledge. This phase is better facilitated with the use of technology and communication networks. Integrating explicit knowledge with the use of computers and artificial intelligence enables the creation of improved knowledge through models, manuals, books, articles, information systems, and other forms of information. The SECI spiral concludes with the *internalization* phase, where explicit knowledge becomes part of the life of the person. In organizations, for example, employees read policies, guidelines, and operation manuals and apply them at work. Training programs allow personnel to integrate new knowledge within their own mental models and enrich their knowledge and skills, paving the way to new tacit knowledge generation. The new experience spirals and starts again with the sharing of experiences, initiating further conversion processes. The SECI model gives rise to the spiral of knowledge generation as new experiences are being shared again.

While PL is essential for advancing organizational success, it faces challenges related to leadership and knowledge management. Workplace knowledge management reveals significant gaps: leaders and teachers often possess rich, tacit knowledge that is difficult to articulate, document, and share with others (Etor et al., 2011). This hampers the conversion of tacit into explicit knowledge and stifles the generation of new ideas essential for organizational growth. Many organizations today recognize that they are not effectively leveraging employee knowledge, and their long-term success hinges on their ability to manage this knowledge explicitly and utilize it as a means to achieve organizational success (Herschel et al., 2001). At DepEd, Ifugao, very few school leaders are aware of or have a limited understanding of PL. Aside from that, a knowledge management model that serves as a guide for leaders has yet to be established.

Seidle et al. (2016) revealed that organizations' investment in leadership training, coaching, and development significantly enhances the performance of leaders, underscoring the importance of leadership training as a crucial factor for success. Allocating financial resources toward leadership training and development is crucial because it improves organizational performance, supporting the idea that such training and development are vital for organizational success. Leaders who take on roles without fundamental management and leadership skills can cause numerous negative effects, including increased employee turnover costs, decreased employee morale and loyalty, and lower customer satisfaction levels. Any organization striving for success in today's environment must recognize and leverage diversity to its advantage. The importance of training and professional development for individuals in leadership roles is essential; however, as noted by the superintendent of the DepEd in Ifugao, training for school leaders faced obstacles during the pandemic. This highlights the need for capacity-building activities to empower school leaders. Although the SECI model has been widely used across various fields, its application in education remains relatively limited (Hu et al., 2023). Emphasizing the SECI model is therefore necessary when conducting capacity-building efforts for education leaders. Several leaders from DepEd also expressed their desire to receive training in PL, emphasizing their need for it as leaders.

The study aimed to assess the level of awareness and comprehension of PL among school leaders and teachers within the DepEd. In addition, the study aimed to create a knowledge management model for the department that illustrates the SECI phases of PL from the perspectives of school leaders and teacher representatives.

Method

The study used a mixed-method approach, beginning with a quantitative survey to evaluate the understanding and awareness of PL among school leaders and teachers in the Division of Ifugao, DepED. It was found that most respondents were either unfamiliar with PL or lacked a comprehensive understanding of it. Based on the recommendation of the Schools Division Superintendent and five other leaders, an intervention through an action-oriented extension project focused on capacity-building was organized for DepEd administrators and teacher representatives, led by two other IFSU professors and the researcher. The goal of the capacity-building workshop was to empower school leaders about PL, where the SECI model was clearly explained. The data from the survey served as the basis for the capacity-building activity on PL. Following the workshop, a qualitative method was employed involving a focus group discussion (FGD), which was employed to develop a knowledge management model, applying the SECI model of PL from the perspectives of administrators and teacher representatives. Ethical standards were observed ensuring informed consent. Participation was voluntary, with the right to withdraw at any time. Responses remained confidential and anonymized.

Participants

The survey questionnaire collected data on the awareness and understanding of PL from 151 school leaders, including supervisors, head teachers, school principals, assistant principals, teachers-in-charge, and chief education specialists. During the seminar workshop, 130 leaders and teacher representatives were divided into groups based on their district assignments. Each district had the chance to openly discuss their current workplace conditions related to leadership and the application of the SECI model, guided by the researcher trained in PL. For the FGD, 11 key representatives (KR) participated (six school leaders and five teachers, each from one of the 11 districts of Ifugao). These participants were labeled KR1 through KR11. To qualify as a KR, teachers needed more than five years of teaching experience, and school leaders required at least five years of leadership experience. Both leaders and teacher representatives also attended a capacity-building activity on PL.

Instruments

Survey questionnaires were used to assess the leaders' and teachers' familiarity and understanding of PL. The questionnaire was pilot tested on 50 respondents, achieving a reliability score of 0.90 before finalization and distribution. An unstructured interview guide was employed during the FGD. The aim was to gather information from the school leaders and teacher representatives to develop a knowledge management model for the DepEd based on the SECI model of PL.

Procedures

A Memorandum of Agreement between Ifugao State University and the Department of Education in Ifugao, Philippines, for the project titled "Educational Management Excellence through Research and Extension Advancement, and Phronetic Leadership for Development (EMERALD)," was signed and approved by the Board of Regents. The signing marked the start of the research and extension activities project. Before beginning the research, the researcher, accompanied by two colleagues, visited the Office of the DepEd Superintendent to identify any leadership issues within their division that Ifugao State University (IFSU) could address. The superintendent, along with five other administrators, suggested that a capacity-building exercise focused on leadership would be beneficial. This request by the administrators was supported by the survey results, which indicated that school leaders have inadequate empowerment for PL. An FGD with the 11 KR was conducted after the seminar workshop.

Data analysis

The percentage was used to determine the awareness and understanding of respondents on PL. To analyze the qualitative data provided by the participants, thematic analysis was used. This method involved coding similar data into categories and identifying patterns and relationships between themes to explain the phenomenon under investigation (Braun & Clarke, 2006). From the FGD, a knowledge management model applying the SECI model of PL was created. The DepEd Division of Ifugao's PL model was then presented and submitted to the DepEd Schools Division Superintendent (SDS), who was present during the FGD, for appropriate action.

Findings and Discussions

Awareness and understanding of DepEd school leaders about phronetic leadership

Figure 1 shows that 25 of the 151 respondents (17%) attended capacity building activities related to PL, 25 of the respondents (17%) were aware of PL, and 11 of the respondents (7%) had an in depth understanding and knowledge about PL. The data indicates that school leaders

have a low level of exposure to and engagement with PL. This reveals a gap in their understanding and application of PL skills. This gap may reduce the effectiveness of school leadership when utilizing the approach. Awareness suggests that school leaders and teachers are familiar with PL even if they have not attended formal trainings. Awareness of PL is brought about through informal discussions, reading information, watching videos, attending seminars and conferences, and other modes of learning. The low percentage of leaders and teachers that are aware of PL indicates that many lack awareness. The gap in awareness of PL may indicate the challenge in the evolution of leadership practices within the schools. The low percentage of school leaders, teacher representatives, and those with an in-depth understanding of PL indicates that very few utilize it. A deeper understanding of PL encompasses the ability to apply its principles and concepts effectively in practice. The small percentage of leaders and teachers who were capacitated, aware of, and had an understanding of PL strongly suggests that there is a need for the school leaders and teachers to receive training. It also highlights the importance of initiating professional development programs geared at enhancing the practical applications of PL in educational contexts. The school's division superintendent of the DepEd in Ifugao verbalized her support in providing a capability building project on PL. In particular, this is aimed at the school leaders because they lack leadership training.

Willgerodt et al. (2020) discussed how workshops or capability building projects provide opportunities for participants to learn skills, improve perspectives, and change behaviors to achieve outcomes in health care systems. A study by Agyeman and Aphane (2024) revealed that school leadership practices had a direct influence on both student and teacher commitment, and the teaching and learning process. They also recommended that school leadership be fortified through training initiatives.

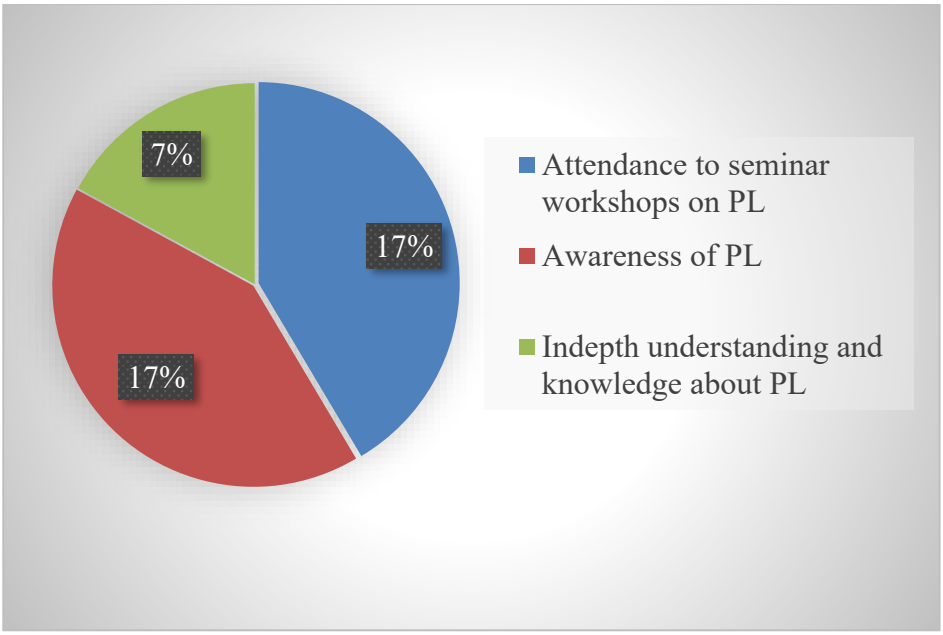

Figure 1 Attendance of DepEd leaders at seminars, workshops, and conferences, as well as their awareness, understanding, and knowledge of phronetic leadership (PL)

SECI-based Knowledge Management Framework for DepEd

Socialization

The SECI model's flexibility and importance in today's educational environments, as highlighted by Wang and Kim (2023), emphasizes its capacity for ongoing development to

address the demands of modern education. The process of socialization, externalization, combination, and internalization, which are the key components of the SECI model of knowledge creation, is actively applied at the DepEd. When the key participant representatives were asked to describe how they would carry out the socialization phase, they explained that the sharing of thoughts and stories takes place when educators, parents, and other stakeholders meet during informal conversations or gatherings. These include events such as “ub-ubfun” (KR 1), "amung" (KR 4), "ab-abig" (KR 5), "Khagwong" (KR 9), during "moma" (KR 7) or cultural engagements, "hamul" (KR 2 and 7), or community free meals. Casual conversations can also occur on the road, in the marketplace, at church, at school, or anywhere (KR 1 & 2).

In addition, KR 3 and KR 4 emphasized: "It is important to be present and participate in conversations because a bright or creative idea can arise from what is being mentioned by anybody present." KR 5 added: "It is even in informal interactions that listening is better observed." KR 4 also explained: "Free thinking through brainstorming allows the stakeholders to build on each other’s thoughts. They are free to open up how they feel and what their thoughts are." KR 7 mentioned that cultural interactions are key opportunities for sharing ideas. KR 9 shared: "We are rich in culture in Ifugao. School leaders, teachers, students, and parents carry with them diverse backgrounds, enabling them to engage in cultural exchanges that promote inclusivity, idea creation, and understanding." "What is shared in chit-chats and even in social media are very diverse because of the culture that we have as Ifugaos; therefore, more ideas arise." KR 8 emphasized the emotional aspect of collaboration: "Through the care and concern of each one, emotional bonds that promote teamwork and collaboration are felt, leading to a positive organizational culture." KR 10 discussed spirituality in the workplace: "Most of us in DepEd are Christians, and starting the conversation with God has become a norm. Ideas are better created when colleagues or parents start their conversation with the recognition of the Most High." KR 2 shared: "We talk about our experiences at school, with parents, and learners and tell stories either face to face or through messenger, group chats." KR 3 added: "Emails, video calls, and other forms of online services" are also used to share ideas. KR 10 explained the importance of continued practices like home visits: "The practice of home visits, which we did even during COVID until now, still prevails. This is our chance to talk informally with parents, know their perspectives, and help their children perform better." Finally, KR 10 emphasized the value of mutual understanding and respect: "Gaining various perspectives that foster a culture of mutual understanding, respect, and trust is important in the socialization phase. Without respect, conflicts arise and relationships are strained.”

The socialization phase promotes a dynamic educational environment by promoting interpersonal relationships and informal knowledge exchange, which are essential to achieving institutional goals. According to Nonaka (1994), socialization enables the transformation of tacit knowledge through shared experiences and interactions. This aligns with Argote and Ingram’s (2000) assertion that learning from interactions among individuals, tools, and tasks contributes to organizational advantage. At the DepEd, this phase centers on informal engagements among internal and external stakeholders, including educators, parents, students, community members, and partner organizations, through culturally rooted gatherings, casual conversations, and digital communication.

Key participants noted that tacit knowledge is co-created through listening, brainstorming, cultural appreciation, collaborative practices, and mutual respect. These interactions often occur within physical or virtual “ba,” shared spaces such as homes, offices, cultural events, and online platforms where stories, insights, and experiences are exchanged. Trust and respect emerged as vital components for effective collaboration and conflict resolution, while prayer was emphasized as a means of aligning actions with shared values and spiritual purpose. As Fullwood and Rowley (2017) highlight, knowledge exchange enhances decision-making and supports organizational development.

Externalization

During the externalization phase, the tacit knowledge acquired in the socialization stage is articulated and transformed into explicit knowledge. This process occurs as stakeholders engage in purposeful dialogues, structured meetings, and collaborative sessions. As Key Respondents (KRs) 1, 2, 9, 10, and 11 collectively noted, "when stakeholders meet, explicit ideas are generated through meetings, dialogues, sessions, and assemblies" (KR 3 & 4). These exchanges commonly take place during School Learning Action Cell (SLAC) sessions, which, as KR 6, KR 7, and KR 10 emphasized, are designed "to improve teaching and learning skills". Such forums including meetings with teachers, staff, parents, and students, serve as platforms for formalizing ideas into actionable strategies. As KR 1, KR 3, KR 7, KR 9, and KR 11 explained, "during meetings or assemblies, participants identify roles and responsibilities and assign committees to carry out specific tasks." These committees are instrumental in the implementation process, as they "execute tasks, provide insights and feedback, and ensure that programs, plans, policies, and activities are effectively implemented."

Parent-Teacher Conferences (PTC) also offer a dedicated space for focused dialogue. As KR 7 highlighted, it is during PTCs that "parents, guardians, and teachers discuss students' progress or concerns." In addition to formal assemblies, stakeholder consultations also play a crucial role. KR 9 and KR 10 pointed out "consultations with multiple stakeholders build trust, foster strong relationships, prevent mistakes, and make those involved more active and participative in developing useful explicit ideas." These structured interactions facilitate the transformation of individual and collective tacit knowledge into clear, communicable knowledge, thereby enhancing decision-making and educational planning.

The externalization phase transforms tacit knowledge into explicit knowledge through codification using tools such as metaphors, visuals, analogies, and structured documentation (Karim et al., 2012). In educational contexts, this involves converting experiences and insights into tangible outputs, such as reports, manuals, policies, and guidelines. Stakeholders, including educators, parents, students, and community members, participate in this phase through meetings, dialogues, assemblies, consultations, and collaborative sessions. These engagements facilitate data sharing, performance assessment, and informed decision-making.

At the DepEd, School Learning Action Cell (SLAC) sessions exemplify this stage by promoting professional development through experiential learning and reflective practice. Interactions in forums such as faculty meetings, parent-teacher conferences, and student dialogues foster critical thinking, inclusive participation, and the integration of diverse perspectives. Structured task forces and conflict resolution mechanisms further encourage organized and productive exchanges. The use of data analytics and performance metrics improves transparency, trend detection, and strategic planning. Overall, sustained stakeholder engagement and coordinated collaboration are essential for producing clear, actionable knowledge that supports school improvement and shared governance.

Combination

In the combination phase of knowledge creation, explicit knowledge is systematized and integrated from various sources, such as memoranda, manuals, databases, and official communications. Participants in the study emphasized that actions, plans, programs, and policies are grounded in formal references. As clarified by the respondents, "we refer to legal bases written in DepEd memoranda, operations manual, umbrella plan of the department, and other references" when developing initiatives. Collaboration is central to this process. KR 4, KR 8, and KR 10 emphasized the value of "planning together in the crafting of school improvement plans (SIP)," while KR 3 highlighted collaboration in drafting the "annual implementation plan (AIP)." Similarly, KR 4, KR 6, and KR 8 stated "action plans and re-entry plans are also created collaboratively." The participants agreed that proposals benefit from

collective input, noting "proposals written by more heads are superior." KR 6 elaborated: "We work together to draft ideas for projects or activities. We establish committees and delegate work to people with greater expertise and experience in the subjects or fields we wish to concentrate on." Consensus-building practices such as drafting resolutions and policies are also common. KR 2, KR 4, and KR 10 shared "In the schools where we are connected, we usually craft resolutions to address problems or to authorize decisions made by the group." KR 5, KR 9, and KR 11 added: "We create policies and guidelines that will help colleagues and learners to know what is expected from them and that they are held accountable."

Setting clear timelines is considered critical for effective execution. As KR 5 and KR 8 noted, "Timelines have to be set to guide the stakeholders in accomplishing targets, including documents to be prepared." Approval from higher authorities is also essential before implementation. KR 5 and KR 6 explained: "All plans, guidelines, manuals, or activities that were crafted by the body should be approved by higher authorities to signal the implementation." In light of evolving educational needs, innovation and responsiveness are emphasized. KR 1 and KR 11 stressed the importance of adapting to change: "There is a need for innovating and updating in anticipation of changes and the creation of new pedagogies, models, and improved performance and learning outcomes." Coaching and mentoring are also instrumental in this phase. According to KR 3, "More ideas are shared when stakeholders are coached. In DepEd, experts coach beginners even those who had been in the service for years which helps in the improvement of proposals, guidelines, and approaches." Instructional materials, guidelines, and policies are used in mentoring sessions to enhance teaching quality and planning. As the participants highlighted, the objective of mentoring is to "improve results, teaching and learning, pedagogies, plans, and school endeavors." KR 11 emphasized the importance of mindset in applying knowledge: "A growth mindset helps in the application of existing knowledge written in communication letters, manuals, and plans. Being open instead of having a fixed mindset will positively impact teachers, students, and officials." Collaboration with external institutions is also recognized as a strategic approach. KR 2 remarked: "When we make plans and policies, we need the help of other schools, organizations, or firms. It is therefore important that we partner for easier access and assistance." Similarly, KR 3 added: "Our linkage with other organizations that have documents and data that we need are helpful for us in DepEd to use and perform better."

The combination phase of the SECI model involves integrating explicit knowledge from various stakeholders to produce new, actionable knowledge essential for organizational development (Rice, J. L., & Rice, B. S., 2002). This phase draws on knowledge generated during the externalization process (Nonaka et al., 2000) and involves synthesizing diverse perspectives, data, and documentation into structured outputs such as proposals, policies, guidelines, and strategic plans. In the context of the DepEd, the combination phase is operationalized through collaborative efforts among teachers, administrators, parents, students, local government officials, and other stakeholders. These groups engage in joint planning, proposal writing, and resolution crafting, grounded in established references such as DepEd memoranda, manuals, and national policy frameworks.

This inclusive approach enhances the relevance and effectiveness of decision-making, promoting a sense of shared ownership. Activities such as mentoring, coaching, data analytics, digitalization, and innovation play a crucial role in transforming existing knowledge into practical applications. As Van den Hooff and Van Weenen (2004) assert, knowledge-sharing processes enable the development of instructional materials, information systems, and best practices. Within the DepEd, data analytics informs policy refinement by identifying underperforming programs, allocating resources, and evaluating student and teacher outcomes. Timely stakeholder engagement is crucial, with the establishment of clear timelines for policy discussions, proposal submissions, and development plans, ensuring the efficient

implementation of these initiatives. Approvals from higher authorities are supported by the clear documentation of stakeholder involvement. Moreover, the use of technology and artificial intelligence facilitates the creation of digital platforms that support information sharing, collaboration, and decision-making.

The DepEd's knowledge integration efforts also promote a culture of innovation and continuous improvement. Regular updates to plans, policies, and guidelines are necessary to keep pace with the evolving educational landscape. Capacity-building initiatives further empower stakeholders, while encouraging the adoption of growth mindsets among educators, leaders, and partners. This shift enables the exploration of new methods, tools, and technologies aimed at improving learning outcomes and ensuring responsiveness to learners' needs.

Internalization

The internalization phase enables stakeholders to reflect on how they will act, advance systemic change, enhance communication and relationships, and assimilate newly developed explicit knowledge from the combination phase. As part of this process, stakeholders' transition from a conceptual understanding to practical implementation, enabling the transformation of explicit knowledge into tacit knowledge through experience and application. According to the participants, various outputs from the combination phase serve as instruments for action and learning. The participants explained "approved policies and guidelines (KR 5 and 9), plans (KR 3, 4, 5, 6, 8, 9, 11), projects (KR 1, 2, and 4), activities, and memorandum of agreements (MOA) (KR 4 & 7) that were the offshoots in the combination phase are to be implemented and practiced." The act of implementation enables stakeholders to engage with new ideas and experiences, leading to deeper learning and reflection that can be shared and reintegrated into the organizational knowledge cycle.

Empowerment is a central outcome of internalization. Other participants stated, "Stakeholders are empowered when new policies, guidelines, or projects are implemented" (KR 2 & 5). Communication also emerged as a vital factor in ensuring effective internalization. As emphasized by another respondent, "One contributory factor to the success of policies and plans lies in the importance of communicating or downloading the information to those concerned. This will make them aware of their responsibilities, and they will take action" (KR 5). The process is inclusive, extending beyond internal actors. One participant remarked, "It is not only the internal stakeholders who are empowered but including external stakeholders" (KR 11). According to one account, "It is in the internalization phase where the teachers, heads, or students have their performances evaluated" (KR 1, 6, & 7). This process is crucial as it "provides evidence on how the human resources are performing and areas needing improvement." The development of leadership and community involvement is also reinforced through internalization. As one participant noted, "To improve the leadership, community engagement, and for the students and teachers to be more responsible while supporting the school environment, the practice of volunteerism will be of great help" (KR 8). Another respondent affirmed this by stating, "Stakeholders internalize the values of service and contribute more to society when they volunteer" (KR 9)

Internalization also facilitates improvements in educational planning, including the adaptation of new pedagogies and strategies that meet evolving needs. A respondent explained, "Adopting to changes is instrumental in increasing student outcomes and a more equitable educational experience for the learners and teachers" (KR 10). As these changes are enacted, stakeholders acquire and apply new competencies. One participant described "in the course of the implementation of guidelines or plans, new skills, knowledge, and values are acquired and applied, which pave the way in the creation of new tacit ideas" (KR 11).

Recognition also plays a motivational role in reinforcing internalization. One participant stated, "Generally, when teachers or employees are given awards and recognitions, they feel

they are valued and they are motivated to continue a culture of high-level performance" (KR 4). Ultimately, as stakeholders internalize and apply knowledge, they begin to construct shared models and develop a contextual understanding that elevates institutional performance. As one respondent summarized, "New ideas are created when they are motivated," leading to school-wide improvement and progress toward learner success.

In the internalization phase of the SECI model, explicit knowledge is transformed into tacit knowledge through the practical application of plans, policies, projects, and training. Within the DepEd, this process is carried out through implementation, capacity building, communication, performance evaluation, volunteering, and recognition. Stakeholders—teachers, school leaders, students, and parents gain insights by engaging in activities such as executing school improvement plans, participating in training workshops, and adopting new pedagogical approaches. These experiences help embed values, knowledge, and skills into everyday practice, leading to the development of shared mental models. Effective communication of goals and continuous feedback are essential for stakeholders to internalize knowledge and act.

The Department of Education utilizes performance assessments to inform ongoing improvements, reinforcing internalization through reflective practices. Volunteer programs, such as *Brigada Eskwela*, offer opportunities for stakeholders to apply and reinforce their knowledge while engaging with the community. As policies and changes are implemented, internalization is supported through gradual adaptation, logistical and psychological support, and alignment with real-world learning approaches, such as problem-based learning. Recognition and rewards further motivate stakeholders, reinforcing positive behaviors and encouraging knowledge sharing. Acknowledging exemplary performance helps build a culture of excellence and supports the ongoing creation of new tacit knowledge. Ultimately, internalization within the DepEd is achieved through a sustained culture of experiential learning, collaboration, and strategic support. This aligns with the cyclical nature of the SECI model, where knowledge continuously evolves through phases of socialization, externalization, combination, and internalization, as applied in pedagogical and technological contexts (Wang & Kim, 2023). The process of the SECI model at the DepEd is illustrated in Figure 2.

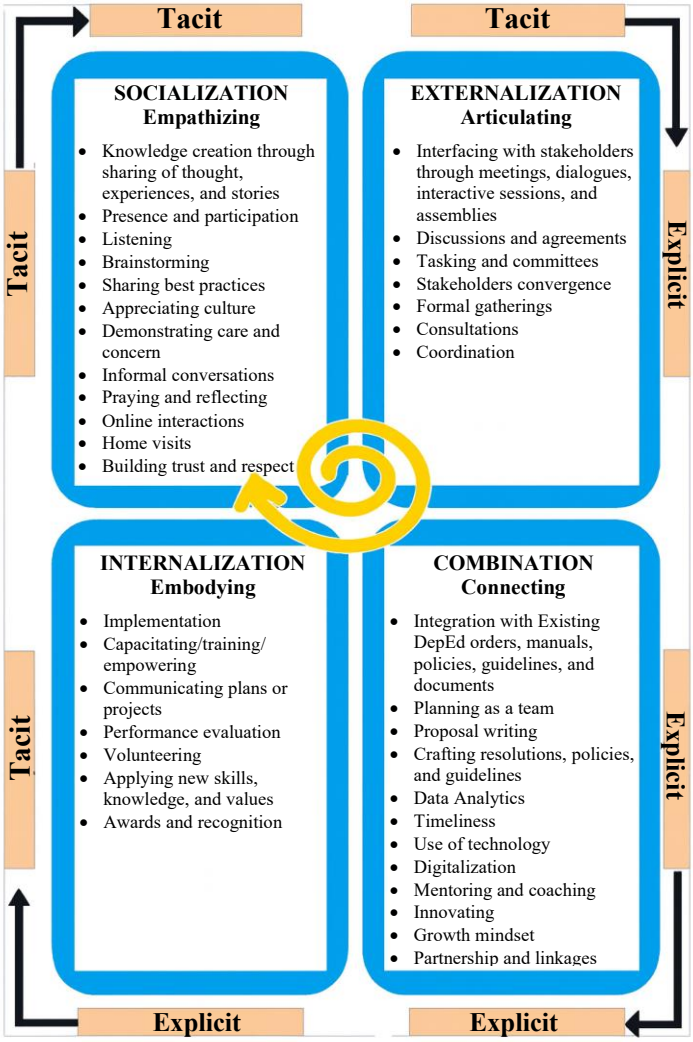

Figure 2 SECI-based Knowledge Management Model at the Department of Education in Northern Philippines

Conclusions

The study shows that school leaders have restricted participation in capacity-building seminars focused on PL, which leads to diminished effectiveness in school leadership through this approach. The inadequate awareness of PL suggests challenges in advancing leadership practices within educational institutions. The small proportion of school leaders possessing a comprehensive understanding of PL indicates that few have actively engaged with this concept. Furthermore, the limited number of leaders and teachers who have been trained in, are aware of, and understand PL underscores the necessity for further capacity-building initiatives. This situation highlights the urgent need to implement professional development programs that enhance the practical application of PL within educational settings. Continuous improvement in organizations occurs when they formalize through policies, a contextualized knowledge management model based on the SECI dynamics, which were created by stakeholders themselves to meet their needs and those of the industry. This can be achieved by establishing both structured and informal platforms for knowledge sharing, supporting the socialization of tacit knowledge among staff, educators, administrators, and clients. A standardized system for recording and converting tacit knowledge into explicit formats is essential for supporting the externalization phase of knowledge creation. This system should also facilitate the

development and maintenance of a knowledge management database that consolidates all codified knowledge and resources, ensuring integration and easy access across the organization, in line with the combination phase. Regular monitoring and evaluation of each activity or project are vital for reinforcing learning and embedding knowledge into daily operations. The cycle then continues through feedback mechanisms.

The exchange of knowledge is crucial for enhancing the internal knowledge reservoir of an educational institution, which is vital for its success. By implementing the model created by DepEd leaders and teachers, which starts with the socialization process, the educational sector cultivates environments that promote open communication and relationships centered on knowledge co-creation, yielding a wealth of insights and innovative ideas. The integration of tacit and explicit knowledge generates valuable resources and supports the ongoing development of policies, pedagogical strategies, instructional materials, records, and various databases. Adopting interdisciplinary approaches enhances critical thinking, problem-solving abilities, and the realization of new plans, projects, and activities. Internalization enables the school's human resources to transform explicit knowledge into tacit understanding. This transformation enables new educators, students, parents, and other stakeholders to apply the knowledge they have acquired in real-world contexts, thereby facilitating the generation of new ideas. Experiential learning in the internalization phase fosters a culture of continuous improvement. The SECI model operates cyclically, incorporating feedback loops that promote a responsive approach to leadership, teaching, and learning. Furthermore, the application of the model within the educational sector, which contributes to the accomplishments of plans and improved performance, can be enhanced through the utilization of digital platforms across all processes.

Looking ahead, researchers are encouraged to further explore PL and knowledge management, particularly focusing on the SECI model. Evaluating leaders' development needs and implementing action-oriented programs enhances leadership potential, ultimately leading to better performance. Driving innovation and executing plans for organizational success involves recognizing the knowledge shared by colleagues. Conducting studies based on the SECI model serves as a guide for designing and implementing knowledge management strategies, enabling institutions to improve their performance.

Implications of knowledge co-creation and the SECI model in educational management

The growth of knowledge in educational management improves the efficiency and effectiveness of organizations. School leaders can gain insights to enhance their decision-making skills, especially in situations that require a deep understanding of the context and careful consideration of all key advantages and disadvantages from stakeholders. Therefore, it is strongly recommended that leaders create a framework to foster knowledge development, which, in this case, is guided by the SECI model (socialization, externalization, combination, and internalization). The co-creation of knowledge, where diverse stakeholders share their experiences, expertise, ideas, and insights, results in new developments, practices, and success stories within the education sector.

For school leaders, facilitating knowledge co-creation can strengthen collaboration among teachers, parents, community members, students, and partners, leading to a shared vision tailored to their specific needs. By fostering an environment where educators and staff are willing to share their expertise and experiences, leaders can support the professional and personal growth of their workforce. Educators can leverage the insights of students, parents, and specialists to develop a curriculum that is relevant and culturally sensitive. Student learning outcomes improve when their contributions are recognized by the educational community. Co-creation efforts encourage parents to take active roles in their children's education. Parents are invited to share their suggestions, actions, and concerns, which can directly impact the school.

School leaders can gain valuable insights from diverse stakeholders to create informed policies that reflect students' needs, ensuring that educational reforms are both relevant and effective. Knowledge co-creation fosters networks and a collective commitment to achieving educational excellence.

The process of socialization facilitates an environment of openness and trust among school leaders, teachers, parents, students, and other stakeholders, where implicit knowledge is exchanged through informal social interactions. Teachers articulate their perspectives on teaching methodologies, student engagement, and various pertinent issues. Parents establish a connection with the school, thereby fostering a supportive community. Students share and learn from each other's experiences and ideas. During the externalization phase, leaders motivate teachers, parents, and other stakeholders to articulate their knowledge through meetings, sessions, discussions, assemblies, gatherings, and documentation. Teachers participate in meetings or assemblies and develop or implement strategies and assessment tools for students. Parents provide feedback and share their insights regarding their children to enhance the school's services. Other stakeholders contribute their ideas and expertise to inform the school's development. In the combination phase, with the assistance of technology, school leaders facilitate the integration of knowledge from teachers, parents, community members, and partners to formulate plans, programs, activities, policies, guidelines, and other initiatives. Teachers may collaborate to synthesize different teaching approaches and resources into contextualized lesson plans that benefit students. Other stakeholders assume various roles to ensure that the explicit knowledge acquired is combined with existing explicit knowledge to generate new insights. In the internalization phase, stakeholders adopt new plans, manuals, guidelines, and policies. The new experiences and ideas are subsequently shared, thereby fueling the cycle of tacit knowledge development.

Acknowledgements

This research was funded by Ifugao State University, Philippines.

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