Development and validation of pedagogical leadership scale

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Abstract

Purpose – Pedagogical leadership (PL) has been regarded as the best leadership style in the education sector. Thus, the aim of this study was to develop and validate a pedagogical leadership scale (PLS).

Design/methodology/approach – Two distinct approaches (inductive and deductive) were utilized. First, a review of the literature was conducted, and then qualitative data were collected through interviews, and their responses were categorized into 40 items. These items were thematized using exploratory factor analysis (EFA) by involving 300 participants. To examine the fitness of the scale, the researchers conducted a confirmatory factor analysis (CFA) with 470 participants.

Findings – EFA discovered a total variance of 64.766% for four factors. In CFA, RMSEA, NFI, RFI, NNFI, CFI, GFI and AGFI values were accepted. The highest correlation was found among constructs of PL. Path analysis revealed PL affected social, professional, intellectual and academic capitals. The correlations between the PLS and psychological empowerment demonstrated the theoretically predicted relationships with these variables. Thus, with the initial evidence of a valid and reliable PLS, a pool of 32 items under 4 factors (social, academic, professional and intellectual capital) were developed.

Originality/value – Despite the management of childhood education requiring the practice of PL, it is underexplored in childhood schools, particularly to our knowledge, no studies have been conducted to develop and confirm the PLS in Ethiopia.

Keywords Academic capital, Intellectual Capital, Professional capital, Social capital, Pedagogical leadership

Paper type Research paper

Introduction

The provision of quality education in school settings both at the national and international level, however, is determined by several factors. One of these factors is principal leadership behavior as demonstrated in the vast body of school leadership literature (Contreras, 2016; Bush, 2008; Peng and Vastatkova, 2015). Moreover, there is a strong belief that the quality of leadership makes a crucial difference in school and student outcomes (Bush, 2008). School leaders have several roles in staff performance through job satisfaction, empowerment and procedural justice (Abu Nasra and Arar, 2020). These results generally support that effective leadership style have significant importance for the success of schools.

There are several leadership styles such as instructional, transformative and pedagogical that contribute to the success of schools (Macneill *et al.*, 2003). School leaders within any school have a prominent responsibility to lead the schools toward the realization of organizational goals by promoting and supporting an inclusive environment. It, hence, calls for various types of leadership (Modise, 2019). In the 21st century, from these leadership styles, pedagogical leadership (PL) has been regarded as one of the best effective leadership styles in the education sector (Sergiovanni, 2001). It was originally proposed by Sergiovanni

(1998) who defined it as making capital available to social and academic capital for students and intellectual and professional capital for teachers for classroom effectiveness.

Pedagogical leadership and other similar educational leadership styles

The educational leadership styles of school principals play a crucial role that can affect school performance. One of these educational leadership styles is PL. The term pedagogue derives from the Greek and refers not to the teacher, however, it is the watchful slave or guardian whose responsibility was to lead (agogos), the young boy (paides) to school. Literally, the Greek pedagogue had to lead the way to indicate to the child how to go to school and come back home. This literal definition had the meaning of leading in the sense of accompanying the child and living with the child in such a way as to care and offer direction for his or her life (Manen, 1991). Abel (2016) defined pedagogy as the art and science of teaching with a focus on the dispositions and behaviors of teachers and their relationship with students.

Different scholars consider PL as distinguished from traditional leadership in that traditional leadership approaches primarily emphasize effective administrative management, while PL gives attention to building a relationship (Lee, 2016). According to Sergiovanni (1998), PL also varies from others such as bureaucratic and visionary leadership in that PL increases the value of human capital. Bureaucratic and visionary leadership styles give more emphasis to easing material or physical value. PL can be beyond other educational leadership as it is valuable in combining moral issues, bond building and the creation of knowledge (Fullan, 2001).

Other educational leadership styles related to PL are transformative and instructional leadership. All pedagogical, transformative and instructional leadership are important for creating a positive and effective learning environment for students. However, they emphasis various dimensions of the education process and require various competencies (see Table 1). Transformative leadership is normative and starts with questions of justice and democracy for both individuals and society purpose (Shields, 2010; Shields and Hesbol, 2020). It gives particular emphasis to those who are from minor groups such as recent arrivals without considering their language, ethnicity, religion, gender and so forth. Transformative leaders

		Pedagogical leadership		Instructional leadership		Transformative leadership
Emphasis	-	On student learning. It is leadership molded around an individual learning style and personality (MacNeill et al., 2005)	-	On teacher actions and mandated curriculum. It preconceived based on a curriculum) (MacNeill et al., 2005)	-	On deep and equitable change in social conditions (Shields, 2010)
Leader	-	Makes capitals available to foster student learning and teacher development (Sergiovanni, 1998)	-	Ambitious standards for student learning; belief in professional support and responsibility; and commitment to inquiry (Knapp et al., 2003)	-	Lives with tension and challenge; requires moral courage and activism (Shields, 2010)
Goal	-	Set up school norms of continuous quality improvement and fostering family engagement (Abel, 2016)	-	Enhance classroom-centered test results (MacNeill et al., 2005)	-	Create individual, organizational and societal transformation (Shields, 2010)

Source(s): Authors' own work

Table 1.
Distinctions among the three styles of educational leadership

ensure both critique and promise and recognizing that transformation always involves some pushback (Shields and Hesbol, 2020).

Heikka (2014) also points out that pedagogical and instructional leadership are used interchangeably; however, PL is a broader term than instructional leadership for setting up organizational norms of continuous quality improvement and fostering family engagement and so forth (Abel, 2016). Macneill *et al.* (2005), in contrast to PL, in instructional leadership, students' interests are driven by a mandated curriculum and classroom-centered test results are seen as a goal, the principal as an instructor of teachers and pragmatic in nature (Macneill *et al.*, 2005). Because of the aforementioned insufficient and narrowness of instructional leadership (Abel, 2016; Macneill *et al.*, 2003, 2005), the present researcher focused on PL. The summary of the three main educational leadership styles were summarized in Table 1.

Why focus on pedagogical leadership?

The present researcher has been interested in developing and validating the pedagogical leadership scale (PLS) due to the following implications. First, the use of pedagogy and leadership in combination is still relatively untouched and limited (Emmanuel and Valley, 2021). PL is a new paradigm of education and school, ensuring a high-quality education and a riches profile for leadership (Contreras, 2016; Peng and Vastatkova, 2015). According to Abel (2016), PL is a unique and new discourse with its deep emphasis on main education purposes and school effectiveness. For the education institutions under study, this research provides practical insights to school stakeholders regarding the degree of school principal practice of PL style. These results have the potential to make school leaders more accessible to more teachers, students and community and so contribute to ensuring quality education for all (SDG 4).

Second, leadership in general and school leadership, in particular, is a debatable study area subject since leadership is varied in terms of roles, setting and behavior (Jäppinen, 2012). Thus, the researcher is interested to develop and confirm an instrument of PLS in depth in the study area. Third, practicing PL fosters student learning in focus and the effectiveness of schools in general (Okoth, 2016) by empowering teachers to exercise professional responsibility and supportive judgments (Macneill *et al.*, 2003).

Fourth, despite the management of childhood education and schools should practice PL, PL is underexplored in childhood schools (Alava *et al.*, 2012; Heikka and Waniganayake, 2011; Ord. *et al.*, 2013). Pedagogical practice in primary schools usually denotes a quality of interaction between school stakeholders (Modise, 2019). Research in schools of England and in Finnish early childhood education confirmed the need for pedagogical leaders to offer high-quality early childhood education. Teachers also anticipate PL from their center directors (Webb, 2005).

Generally, even if the childhood development sector is a place where that promotes high-quality early learning s for young generations (Modise, 2019), the obstacle in Ethiopia is that most of the primary school administrators and teachers have not had some professional training which affect the quality of their practice negatively. Like global trends, Ethiopia is not immune from the influence of school leadership on enhancing school effectiveness. In general, school leadership has received great attention in Ethiopia with the revamping of school leadership preparation programs. However, the efforts made by the government were not able to produce the required man power (MoE, 2017). MoE (2017) have found that school principals generally lack the required managerial and leadership competencies to lead schools. Ethiopia's education roadmap of 2017–2030 revealed that lack of research-based educational leadership development as a major challenge (MoE, 2017). The nature and measure of school principals' leadership styles in general and PL in particular is still debatable at best that demand further investigation as being vital for theoretical as well as

practical reasons. Finally, to our knowledge, no studies have been conducted to develop and confirm the PLS in primary schools of East Gojjam province, Ethiopia context. Hence, due to this gap and significant implications of the scale, it would be convenient for the researcher to validate the scale in the selected place. Moreover, the researcher was also interested in confirming the PLS's relationship with the psychological empowerment dimensions and collecting information on possible demographic characteristics differences about the PLS.

Conceptual framework and psychometric properties of the pedagogical leadership scale

The present study used Sergiovanni's (1998) model of PL as the theoretical basis for their instrument development because his model enables school stakeholders such as leaders, teachers and students to foster shared leadership. Another reason for using Sergiovanni's model (1998) is the familiarity of his framework as it was the most widely referenced in the literature. Moreover, Sergiovanni's model (1998) identified four core (or basic) dimensions of PL (Sergiovanni, 2001). These are social, academic, intellectual and professional capitals.

Social capital
Social capital focuses on norms, obligations and trusts amongst people in a school in particular and society as a whole by creating caring relationships (Coleman, 1988; Lunenburg and Ornstein, 2004). Students should have access to social capital such as obligations, norms and trusts in school and at home. Students generate antisocial teams if they have no access to social capital in the school (Sergiovanni, 1998, 2001). Tsang (2009) stated that schools can enhance school social capital by sustaining expressive action and cultural intervention and balancing of a loosely coupled systems and tightly coupled systems of school social networks. In a caring school, students, teachers and family are warmly greeted each morning in various forms and also teachers are assumed students as unique persons as well as valued members of the classroom community (Gaetz, 2016).

Academic capital
Academic capital focuses on promoting an in-depth quality teaching and learning culture by focused communities (Newmann *et al.*, 2007; Sergiovanni, 1998, 2001). The main goal for students learning across academic subjects in school is to create authentic intellectual work (Newmann *et al.*, 2007). Principals' influence on student learning is secondary next to teachers. However, pedagogic leaders have a significant role in cultivating school stakeholders (such as teachers and administration personnel) and in developing a collective vision and mission to improve student learning (Macneill *et al.*, 2003). For cultivating the teaching and learning process, successful classroom pedagogy is required, particularly teachers should understand how students learn and should have the independent to design educational activities which in line with students' learning styles, interests and needs. The pedagogic leader indicates credible knowledge of learning and teaching beyond teachers, which results in fostering school-wide learning (Macneill *et al.*, 2005).

Intellectual capital
Intellectual capital focuses on what all school stakeholders share and know in schools for the whole school community (Nahapiet and Ghoshal, 1998). According to Kesari *et al.* (2017), human capital is the stock of knowledge of an organization's members and can be regarded as the soul and mind of intellectual capital. Human capital is conceptualized as the teaching competency of teachers. Intellectual capital of teachers, school's capacity and performance of

students are positively related. Intellectual capital is also the structural capital (non-human) of organizational charts, executive processes, leadership and management style, organizational culture, databases, employees' incentive plans, administrative procedures, processes, strategies, action plans and, in general, whatever that has more value to the organization than its physical or material value (Marr *et al.*, 2003). Finally, to develop the intellectual capital of teachers, teachers should learn, care and support each other learn (Sergiovanni, 1998). Teacher development can help build the intellectual capital that teachers need to keep up by increasing their knowledge of the disciplines and the pedagogical-content knowledge teachers need to teach these disciplines effectively (Sergiovanni, 2001). Bhatti and Zahee (2014) and Cheng (2015) further conceptualize school intellectual capital as human, internal (structural) and external capital that resides in other teachers, school policy and relationships with parents. External capital represents the knowledge embedded in the relationships with the outside environment (Cheng, 2015). The intellectual capital of the school can be improved by a professional learning community which is a group of people who are motivated by a vision of learning and who support one another toward improving student achievement (Burden, 2003; Mindich and Lieberman, 2012).

Professional capital
Principals also can develop professional capital for teachers by cultivating communities of practice in the school (O'Brien, 2005; Sergiovanni, 1998, 2001). Communities of practice are at school, at work, at home or everyplace. Even if membership in a community of practice is still understudied in most schools, according to Sergiovanni (Alava *et al.*, 2012; García-Martínez and Tadeu, 2018; Sergiovanni, 1998), good schools take collegiality extremely and support teachers' knowledge and learning. According to Hargreaves (2016), professional capital emphasis on human capital that gives attention to the professional growth of staff via professional development and continuing education. Professional capital also focuses on the decisional capital of staff, which refers to the teachers' wisdom, judgment and expertise that they experience concerning the instructional and learning of students in the form of reflection and feedback from colleagues. The aim of building decisional capital is to encourage and help teachers to decide according to their judgment of the teaching and learning process. This is a hallmark of being a professional (Hargreaves, 2016).

Finally, by using Sergiovanni's (1998) model of PL is the theoretical basis for their instrument development because this study has the general purpose of developing and validating a scale which will describe different dimensions of PL style and will apply extensively in primary schools of Ethiopian context.

Method
Research design
For scale creation, two distinct approaches (Inductive and deductive) were utilized (Tay and Jebb, 2017). Moreover, the study has parts: *Study 1* – Exploratory Factor Analysis (EFA) was carried out to figure out the factor structure of the PLS (Mihas and Institute, 2019). As a result, the measuring scale consists of four dimensions: Social capital, academic capital, professional capital and intellectual capital. EFA with 300 valid survey data was carried out. *Study 2* – To know the fitness of the instrument for this study, the researcher conducted Confirmatory Factor Analysis (CFA) with 470 participants.

Participants
From East Gojjam province population, Ethiopia, all 14,693 primary school teachers and 929 principals in the East Gojjam province were targeted for this scale development. Qualitative

data were collected through interviews with maximum variation sampling from a total of 14, 9 from teachers and 5 from principals. Including two groups (teachers and principals) in interviews allowed the researcher to comparison and at the same time commonality in the analysis to occur (Çokluk *et al.*, 2010). EFA with 300 valid survey data was carried out. For EFA, 175(58.3%) are female while the remaining 125 (41.7%) were male. Moreover, the majority (260) participants were diploma holders. Moreover, for CFA, a sufficient sample (470 participants) participated in the study. For the second study, CFA by using a multi-stage sampling method, the sample of the study was determined. In the first phase, four districts (Machakele, Debre-Markos, Debre-Elias and Gozamen) were chosen from eighteen districts in East Gojjam province by using a simple random sampling method. In the second phase, 83 schools were chosen from 4 districts (which comprised of 166 schools) by employing simple random sampling. Epi Info program was used to calculate the sample size estimates according to different statistical calculations. According to Epi info version 7 formula under 5% marginal error, for 14,691 total target participants, 374 teachers were taken. Thus, the researcher anticipated that the non-reply of some questionnaires was due to the potential sensitivity of items. Thus, 20% of the recommended teachers ((20/100 × 374)) = 75) were included. Accordingly, the total sample size was 449. These teachers were not included in the first study (EFA). That means, EFA data set is different from the CFA dataset. Thirty-nine survey were removed from the study since they were incomplete. Therefore, the return rate was 420 (93.54%), which is acceptable (Cohen *et al.*, 2018). All 83 principals in the selected schools became the sample of the study. However, merely 50 principals gave full information. Therefore, the total number of participants was 470 (420 teachers and 50 principals). For CFA, the demographic characteristics of the principals and teachers who participated in the quantitative research are presented in Table 2.

Process/phases

Scale development needs several procedures (Carpenter, 2018). To ensure the consistency and predictability of this study, the study is upon the scale development recommendations of Lamm *et al.* (2020). Adhering to a well-established set of methodological process phases helps across-scale development endeavors. Generally, it has three main stages (Item development, scale development and evaluation). The overall scale development process is presented in Figure 1.
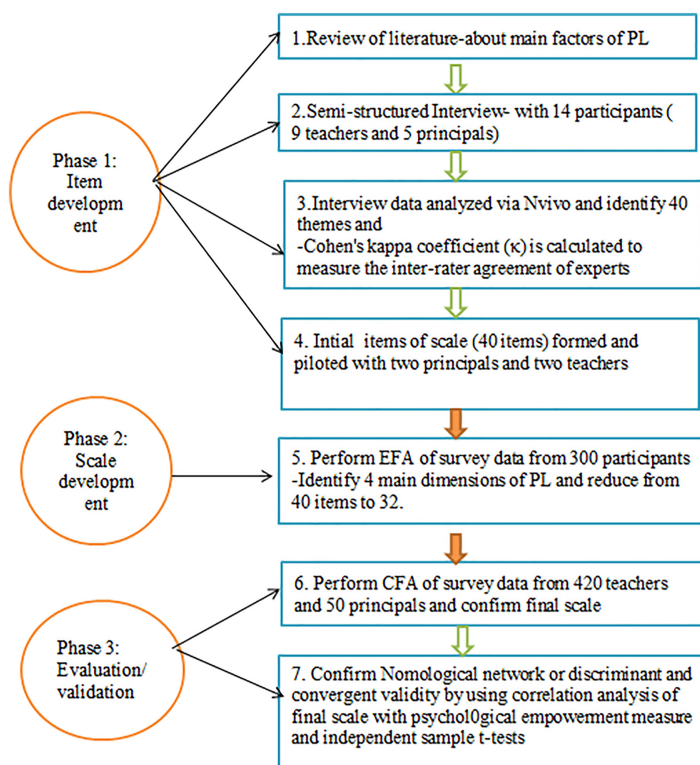
Phase 1. Item development

First, developing a questionnaire or scale for PL was a collaborative process that began with reviewing a list of indicators or theories found in essential reputable publications (DeVellis,

		Teacher (N = 420)		Position Principal (N = 50)		Total (N = 470)	
Background information		N	%	N	%	N	%
Sex	Female	243	51.7	5	1.1	248	52.8
	Male	177	37.7	45	9.6	222	47.2
Level of education	Diploma	363	77.2	17	3.6	380	80.9
	Bachelor	57	12.1	33	7.0	90	19.1
Length of service	1–10	194	41.3	24	5.1	218	46.4
	11–20	129	27.4	14	3	143	30.4
	>21	97	20.6	12	2.6	109	23.2

Source(s): Authors' own work

Table 2.
Personal characteristics of participants

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Phase 1:          1.Review of literature-about main factors of PL
Item
developm          2.Semi-structured Interview- with 14 participants (
ent                 9 teachers and 5 principals)

                  3.Interview data analyzed via Nvivo and identify 40
                  themes and
                  -Cohen's kappa coefficient (κ) is calculated to
                  measure the inter-rater agreement of experts

                  4. Intial items of scale (40 items) formed and
                  piloted with two principals and two teachers

Phase 2:          5. Perform EFA of survey data from 300 participants
Scale             -Identify 4 main dimensions of PL and reduce from
developm          40 items to 32.
ent

                  6. Perform CFA of survey data from 420 teachers
                  and 50 principals and confirm final scale

Phase 3:          7. Confirm Nomological network or discriminant and
Evaluation/       convergent validity by using correlation analysis of
validation        final scale with psychol0gical empowerment measure
                  and independent sample t-tests
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Source(s): Authors' own work

Figure 1.
Overall scale
development process

2017; Lamm *et al.*, 2020). Reviewing a list of indicators or theories is common in research measurement and social science research (DeVellis, 2017). This helps to gain a more concrete understanding of the dimensions (Carpenter, 2018) and prevents the researcher from a potential for misinterpretation and missed opportunities (Lamm *et al.*, 2020). Thus, for this study, Sergiovanni's dimensions of PL scale (social, academic, professional and intellectual capital) give a general framework; however, for more detailed information or items, additional interviews were conducted (Fonsén and Soukainen, 2020).

Second, the interview questions were designed in line with the theoretical knowledge of Sergiovanni's (1998) model of PL. To design the interview questions, the following procedures have been implemented. Prior to interviewing, first, the researcher developed and checked the following interview questions in the English language with the aim.

After that, to ensure content validity, the interview questions were given to two experts in leadership to gain additional insights and triangulation of the concept (DeVellis, 2017; Lamm *et al.*, 2020). It provided the opportunity for the researcher to correct some errors. The semistructured interview was then translated by bilingual two assistant professors from English into the Amharic version. The translators were all native speakers of Amharic; thus, they were familiar with the cultural background of the region in the translation of the items (Aguilar, 2020). Hambleton's method or back-forward translation was used to test its content validity in depth to catch up with the language translation-related problems. It provided the chance for the researcher to correct errors again. After that, a pilot study of interview

questions with two principals and two teachers was conducted to ensure whether the participants could understand the question or not and in order to justify and remove the useless questions and to add some extra material and information to upgrade the questionnaire. The pilot study offered us valuable information to correct some errors (Carpenter, 2018).

Then the last version of the semistructured interview questions was formulated by the researcher and asked both teachers and principals. The interview questions have four main parts (e.g. sample questions for teachers).

(1) Social capital (e.g. generally, how are the interactions among school stakeholders in frequency and closeness? (between generations, within a generation, student–student, student–teacher, teacher–teacher, teacher–parent, parent–parent and so on)?

(2) Academic capital (e.g. Could you tell me about the innovative learning strategies, have you used to encourage students to be hardworking and to help students who perform poorly? How? provide examples)

(3) Intellectual capital (e.g. Are teachers or other school stakeholders encouraged to share their knowledge, experiences, ideas and information freely, bring out their creative abilities and innovate? If so, provide examples? how often? About what they are discussed?)

(4) Professional capital (e.g. What strategies have the principals used to develop the knowledge, competence and skills of teachers?)

During the interview, the researcher took notes and used an audio recorder with the agreement of the interviewees and allowed the interviewee to express his/her opinions freely. Finally, the recorded data were transcribed by researchers.

Third, data collected through interviews were coded and organized into themes by using Nvivo version 12, which supports the researcher to organize data (Cohen *et al.*, 2018). Based on this software, the analysis was conducted in six main steps: Data cleaning; uploading the data into Nvivo; reorganizing the data upon research questions; exploring data (using the "Query command"); coding relevant information (Adu, 2019). Finally, 40 items were generated.

The researcher used Cohen's kappa coefficient (κ), which measures the inter-rater agreement of two academics for qualitative items. The value of the agreement, according to the SPSS-20 output, was 0.714. This showed that the coding agreement or interreliability between experts was very high (Holzmann, 1996). Fourth, in developing the final quantitative instrument (items), the following procedures were followed: first, a pilot study with two principals and two teachers was conducted to improve the validity of the questionnaire developed via interview (Carpenter, 2018). They were informed to write down substitute word/s of their own in case they felt the word or phrase was not suitable or was difficult to understand (Wiersma and Jurs, 2005). The comments made by the principals and teachers were incorporated into the final version of the questionnaire.

Phase 2. Scale development
Fifth, following the literature review, collecting qualitative data, categorizing participants' responses into themes (developing quantitative data), and EFA was run to identify factors with 300 participants. EFA is a common method for examining emerging scales (Carpenter, 2018) and for checking construct validity. In terms of gender, 175(58.3%) are female while the remaining 125 (41.7%) were male. Moreover, the majority (260) participants were diploma holders.

Phase 3. Evaluation. Six fitness of the instrument to the model was checked. Reliability focuses on replicability. Cronbach's alpha and CFA were applied to ensure reliability (Cohen

et al., 2018; Wiersma and Jurs, 2005). In order to know the fitness of the scale, the researcher conducted CFA with the AMOS 23 version with 470 participants. Model Path Coefficient Analysis was also used to see the effect of PL on four dimensions.

Lastly, for construct validity (divergent and convergent validity in particular), researchers were also interested in confirming the PLS's relationship with the psychological empowerment dimensions; collecting information on possible demographic characteristics differences regarding the PLS.

Psychological empowerment scale (for convergent and discriminant validity)
By checking the construct validity of the PLS, particularly convergent and discriminant validity, research has equated psychological empowerment as a related scale (based on the theoretical background of Thomas and Velthouse (1990) and Spreitzer (1995). Likert type 5 scale such as strongly disagree, disagree, somewhat agree, agree and strongly agree was used because of the proximity of Ethiopian teachers and administrators to the five-point grade system in schools. It was also validated in Ethiopian context by Berhanu (2023). Cronbach Alpha for the scale was 0.904. To know the fitness of the instrument in this study, the researcher carried out CFA. Here both RMR and SRMR corresponded to a good fit. According to Berhanu (2023), regarding reliability, Cronbach's alpha for goal internalization. Meaning, influence and competence dimensions were 0.87, 0.842, 0.777 and 0.789, respectively. For this scale, the Average Variance Extracted (AVE) and Combined Reliability are more than 0.7. The IFI, RFI, NNFI and CFI indexes of around 0.95 were corresponded to a good fit (Schermelleh-Engel *et al.*, 2003).

Results and discussion
The participants of the qualitative research consisted of 14 voluntary educators (five school principals and nine teachers). When the distribution of principals by gender is examined, it is seen that all of them are male principals. Three of the teachers are male and six are female. It is seen that the total length of service of principals varies between 11 and 23 years. The duration of the teachers' length of service varies between 15 and 37 years. Eleven participants of the study had previous administrative responsibilities and 3 of them did not have administrative responsibilities. Twelve participants of the study participated in any committee and the rest did not participate in any other committee. When the success of the students is examined, it varies between 92% and 100%. All participants are BA or Master holders. They teach or lead at primary schools.

For the qualitative data, 40 items were formulated and categorized under 4 dimensions: Social, academic, professional and intellectual capital. For developing social capital, participants indicated that principals formed various social groups, encouraged school stakeholders' frequent interactions with each other, applied participatory decisions, facilitated family and community engagement in the school and created a caring school culture to strengthen the school stakeholders' frequent and close interactions and so forth. Teachers and principals also reported that for developing academic capital (for cultivating a deep culture of teaching and learning), principals encouraged teachers to use different teaching methodologies, facilitated teachers to link students' learning with real-world problems, encouraged teachers to make students create their own knowledge, categorized students into groups, appreciated teachers to use different continuous assessment techniques and appreciated students who perform well. Teachers and principals reported that for developing the intellectual capital of teachers, principals also encouraged teamwork among teachers, sharing of experiences and ideas among teachers, peer supervision among teachers, encourage sharing of experiences and challenges with themselves. This is in line with studies

by Alava *et al*. (2012), Webb (2005) and Sergiovanni (1998). Principals and teachers reported that to develop the knowledge, competence and skill of teachers (professional capital), the school principals provided teachers with opportunities to attend training, encouraged informal collaboration for professional improvement, encouraged teachers to continue their education, encouraged practicing continuous professional development program and helped teachers to understand how students learn.

With these qualitatively collected data, an EFA with 300 valid survey data was carried out. Different considerations have been put forward for the number of samples required for conducting EFA. It is emphasized that the ratio of the number of participants to the number of variables (items) is 10/1, and it can be reduced to 5/1; preferably, it is recommended to have a sample size of 100 and above (Büyüköztürk, 2003; Akgül and Çevik, 2003). In this regard, it can be said that the sample group of 300 people is sufficient to conduct an EFA.

To test the adequacy of sample size for factorization, Kaiser–Meyer–Olkin (KMO) and Bartlett Sphericity tests were checked before making EFA. KMO value was 0.87, which means the sample size was an exceptionally satisfactory level to make a factor analysis ($X^2(_{496})$ = 7433, p < 0.01) because The KMO values in the range [0.5–1.0] are deemed acceptable by the standard. In addition, Bartlett's test significant value of 0.000 indicates that the scales satisfy the EFA requirements (Hair *et al*., 2016).

Then, in the first case of the original instrument, 40 items have been included. After the first rotation, it was seen that there were four components with eigenvalues above 1. For the eigenvalue value, the eigenvalue values of the EFA scales are 1.024, which shows four factors. All of these values are satisfactory because by the standard they must be greater than 1 (Anderson and Gerbing, 1988). The contribution of these components to the total variance was 66,018%. Items may be removed from the analysis if they have an overlapping problem or their factor load values are less than 0.30 and placed in the dimension of an instrument that is not theoretically supported (Büyüköztürk, 2003; Field, 2009). Because of the problem of overlap, the items of A23, S15, S14, I28, A18, I27, I24 and S16 were excluded from the analysis, respectively (Leech *et al*., 2015). The aim of EFA was to identify factors and remove overlapping items (Leech *et al*., 2015).

The total variance of the four factors (32 items) was 64.766%. Moreover, the total variance explained index of scale has values higher than 50%. As a result, according to Anderson and Gerbing (1988), these scales satisfy the requirements. Factor analysis revealed that four components were unclosed in the rotated factor matrix. Professional capital has greater factor loadings on the second component compared to social capital, which is stronger on the first. Intellectual capital and academic capital are stronger in the third and four factors, respectively. The data on factor load values and the total variance of the items are given in Table 3.

As shown in Table 3, each dimension consists of a different number of items. The construct of social capital is made up of 13 statements or items. Professional capital included 9 items. Intellectual capital had 5 items as 3 items were already excluded. Finally, academic capital formed 5 items having deducted 2 items.

Each dimension has a different factor load value. The items included in the social capital dimension have a factor load value between 0.493 and .726; those in the dimension of professional capital have a factor load value between 0.493 and 0.726, those in the intellectual capital dimension have between 0.476 and 0.793 and those in the academic capital dimension have between 0.563 and .720. According to Field (2009), the factor load values can be considered meaningful, with a sample size of 50 people, suggested to be larger than 0.722, a sample size of 100 people, larger than 0.512, a sample size of 200 people, larger than 0.364, the sample size of 300 people, larger than 0.298, the sample size of 600 people, greater than 0.21 and with a sample size of 1,000 people, be greater than.162. In the sample size of 300 people, it

Item code	Item	Factor load values			
		Factor 1	Factor 2	Factor 3	Factor 4
S5	My principal applies participatory decisions	0.753			
S4	My principal encourages school stakeholders' frequent interactions with each other	0.695			
S1	My principal eases family and community to engage in students' learning	0.693			
S8	My principal keeps his or her promises	0.690			
S3	My principal creates caring and supportive school culture	0.663			
S6	I consider other school stakeholders as people who are honest and or trust	0.657			
S7	My principal discusses and works with other school stakeholders	0.640			
S2	My principal forms various social groups or clubs	0.632			
S10	My principal gives first place for others	0.629			
S11	My principal emphasis more on actions than words	0.628			
S12	My principal encourages school stakeholder to have shared values	0.612			
S9	My principal creates a trustworthy culture	0.604			
S13	My principal helps exchange of information	0.480			
P33	My principal encourages informal collaboration for professional improvement		0.726		
P34	My principal encourages teachers to continue their education		0.710		
P40	My principal encourages teachers to assess their instructional decisions		0.678		
P38	My principal values teachers' professional judgment and wisdom		0.668		
P32	My principal provides teachers with opportunities to attend training		0.631		
P39	My principal encourages teachers to make sound instructional decisions		0.627		
P37	My principal creates a school culture that respects teachers' instructional decisions		0.615		
P36	My principal encourages teachers to understand how students learn		0.595		
P35	My principal encourages practicing continuous professional development program		0.493		
I26	My principal encourages sharing of experiences and challenges with him			0.793	
I25	My principal helps peer supervision among teachers			0.754	
I30	My principal promotes sharing of experiences with schools within the city or district			0.719	
I31	My principal promotes sharing of experiences with schools out-of-city or district			0.716	
I29	My principal discusses school strategies and action plans with teachers			0.476	
A21	My principal encourages teachers to make students to create their own knowledge				0.720
A20	My principal appreciates teachers to use different continuous assessment techniques				0.712
A19	My principal helps teachers to link students' learning with real-world problems				0.626

Table 3.
Exploratory factor analysis of pedagogical leadership scale

Item code	Item	Factor load values			
		Factor 1	Factor 2	Factor 3	Factor 4
A22	My principal categorizes students into groups to help each other				0.595
A17	My principal encourages teachers to use different teaching methodologies				0.563
% of variance		22.046	17.351	13.430	11.99
Cronbach alpha		0.944	0.927	0.868	0.879

Note(s): Total variance explained rate = % 64.766
Total cronbach alpha = 0.9, KMO measure of sampling adequacy = 0.96
Bartlett's test of sphericity approx. Chi-Square (SD = 496) = 7433.071(p < 0.001)
Factor 1 = Social capital, Factor 2 = professional capital, Factor 3 = Intellectual capital and Factor 4 = Academic capital
Source(s): Authors' own work

Table 3.

can be considered that the factor load values of the items are greater than 0.298 and the difference between the factor load values is at least 0.1 (Büyüköztürk, 2003; Field, 2009).

For Cronbach's alpha, the values for social, intellectual, professional and academic capitals were 0.944, 0.868, 0.927 and 0.879, respectively. Its total Cronbach was 0.9. This result indicated that PL scale is reliable as values exceeded the acceptable level (0.7) with an indication of a good internal consistency of the measurement scales (Akgül and Çevik, 2003; Field, 2009). The corrected item-total correlation analyses were performed for each construct. The range of corrected item-total correlation for social was 0.413 and 0.722; for intellectual capital was 0.351–0.788; for professional capital was 0.434–0.773 and for academic capital was 0.486–0.659. Recommendations typically recommend that items from a given scale demonstrating item-total correlations should exceed 0.3 (Churchill and Iacobucci, 2002). These values revealed that each construct had a good item-total correlation.

Confirmatory factor analysis (CFA)

The researcher carried out CFA with 470 participants for the fitness of the scale. P-value is the first value to be examined in CFA. P-value of this study is significant. CFA revealed the lowest t value was 12.55 (item I29); the highest t value was 22.35 (item I25). If t values from parameter estimates exceed 1.96, it is significant at the 0.05 level; if it exceeds 2.576, it is significant. In this direction, all t values are significant at the level of 0.01 (Çokluk *et al.*, 2010). Let us see the goodness-of-fit index of the PLS in Table 4.

As shown in Table 4, another goodness-of-fit index evaluation technique is chi-square, which is not a statistic that is evaluated alone. In other words, χ^2 = 1,274.1 is taken into consideration by proportioning to the degree of freedom (DF) = 450. When χ^2 is divided by DF, the ratio of χ^2/DF was 2.83 (1,274.1/450). In addition, since it is less than five, the scale has a moderate level of goodness of fit. AMOS then provided a list of modification indices associated with specific parameter modifications. Using modification indices in line with a theoretical model of Sergiovanni's (1998) PL dimensions, the identification of parameters with substantial values were made. After modification with some covariants via the AMOS 23 version, RMSEA revealed a good fit at the 0.052 level. When assessing the goodness of fit continues, it is seen that GFI was 0.901 and AGFI was 0.89. These values of GFI and AGFI were accepted. RMR's fit index was 0.048 and the goodness of fit index of standardized RMR (SRMR) was 0.041. Here RMR corresponded to a good fit and SRMR had the good fit. Finally, when IFI, NFI, RFI, NNFI and CFI fitness indices are investigated, it is seen that IFI = 0.98,

Fit indexes	Acceptable boundary/ criteria	Goodness of fit values for the study
X^2/SD	≤2 = Perfect fit ≤2.5 = Perfect fit (small population) ≤3 = Perfect fit (large population) ≤ 5 = Moderate fit	X^2/SD = 2.83
GFI/AGFI/ NFI/NNFI/ IFI/RFI/CFI RMSEA/RMR/ SRMR/	≥0.95 = Perfect fit ≥0.90 = good fit ≤0.05 = Perfect fit ≤0.08 = Good fit ≤0.10 = weak fit	GFI = 0.901, AGFI = 0.89, NFI = 0.97, NNFI = 0.98, IFI = 0.98, RFI = 0.97, CFI = 0.98 RMSEA = 0.052, RMR = 0.048, SRMR = 0.041

Source(s): Authors' own work

NFI = 0.97, RFI = 0.97, NNFI = 0.98 and CFI = 0.98. The IFI, RFI, NNFI and CFI indices of around 0.95 corresponded to a good fit (Schermelleh-Engel *et al.*, 2003). For more details, the CFA diagram is also presented in Figure 2.

Standardized factor loading, as seen in Figure 2, indicated the direction and intensity of a link between an observable variable and its underlying latent component. They show the extent to which the factor accounts for the variance in the observed variable. A positive and direct link is shown by all standardised factor loadings (the observed variable grows as the factor does). Many academics agree that loadings greater than 0.7 are often regarded as strong. According to Hair *et al.* (2021) and Vinzi *et al.* (2010), loadings values between 0.4 and 0.7 are deemed moderate, while those below 0.4 are weak. Every standardized factor loading value falls between the strong and moderate range.

In the validation of measurement scale estimating convergent and discriminant validity provide credible evidence. Convergent validity assesses the interrelatedness of indicators in theoretically similar constructs, whereas discriminant validity estimates the uniqueness of indicators in different constructs (Collier, 2020). The CFA results of convergent and discriminant validity of PLS revealed that the AVE value of each dimension (Intellectual capital = 0.567, social capital = 0.563 and professional capital = 0.0.604 and academic capital = 0.587) yielded above 0.5; indicated that indicators of theoretically similar constructs were interrelated or indicators load better in a single theoretically related construct and confirmed adequacy of convergent validity of the scale (Brown, 2015; Collier, 2020).

After EFA and CFA, the relationships between the four factors of the PLS were also computed. To affirm to what extent the four dimensions were discriminant from each other and remove redundancy (Messick, 1989). The results indicated that all dimensions of PL were a moderately significant relationship with each other (see Table 5).

As shown in Table 5, the highest correlation was found between social capital and professional capital ($r = 0.667$), while a moderate positive correlation was found between intellectual capital and professional capital ($r = 0.572$). This revealed that when students have access to social capital such as obligations, norms and trusts in school and at home, teaching and learning process (academic capital) would run in a smooth manner, which results in fostering school-wide learning. It can be also said that the increase of social capital in schools will lead to the increase of professional capital, intellectual capital and academic capital and vice versa. These results indicated that while students have good social capital and academic competency in their school and teachers' intellectual and professional competencies are more likely to be enhanced. Arlestig and Törnsen (2014) state that in order
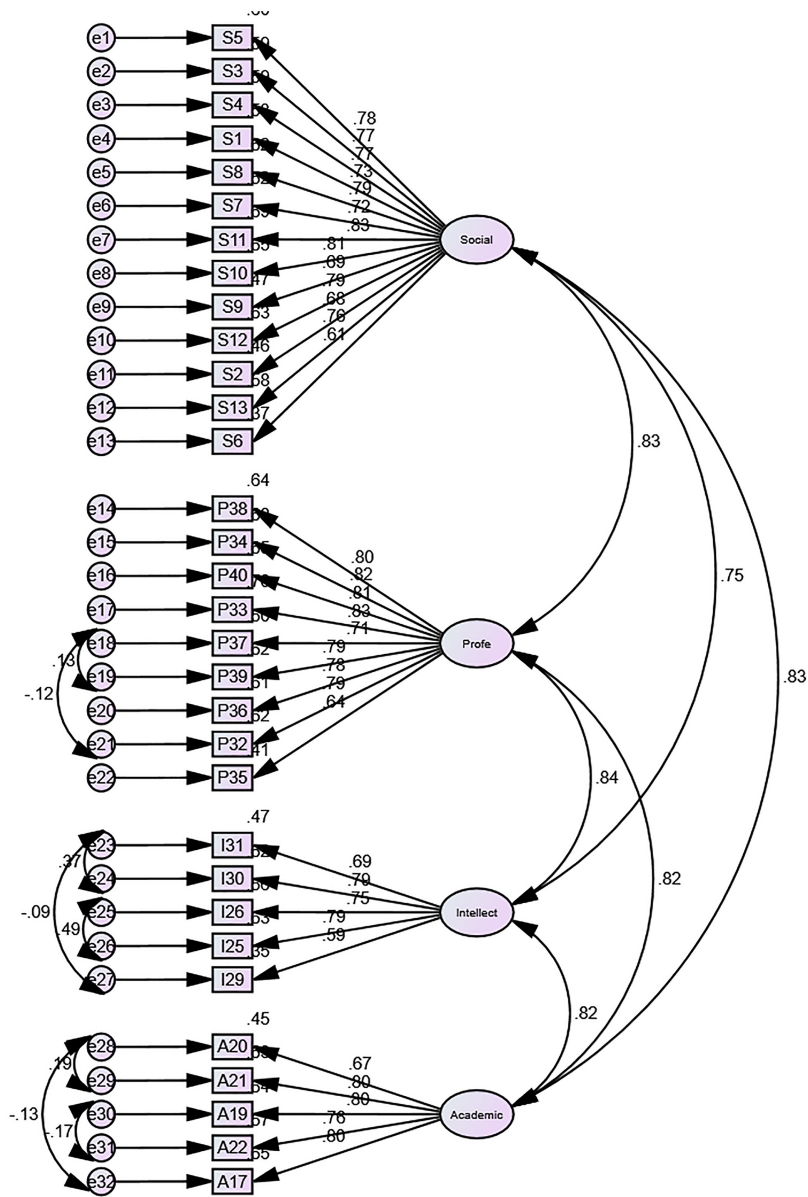
Figure 2.
CFA model of
pedagogical leadership
scale with
standardized estimates

Source(s): Authors' own work

to improve student performance and school outcomes (academic capitals of students),
principals of schools should work and collaborate with teachers. According to Sergiovanni
(2001), there is never a situation in which instructors' professional capital is low and student
achievement is high. One of the most effective ways that school administrators can develop
students' development (social or academic) is through teachers. Thus, the more principals
develop teachers' capitals, the more students' capitals develop.

As shown in Table 6, PL affected social capital [$\beta = 0.887$, $p < 0.01$], professional capital [$\beta = 0.913$, $p < 0.01$], intellectual capital [$\beta = 0.868$, $p < 0.01$], academic capital [$\beta = 0.888$, $p < 0.01$]. PL is accounted for 88.7% of the total variance in primary school principals' and teachers' perceptions toward social capital. PL is accounted for 91.3%, 86.8% and 88.8% of the total variance in primary school principals' and teachers' perception toward professional, intellectual and academic capital, respectively. When t-test results were examined, it was seen that PL is an important predictor of principals' practice of social, academic, professional and intellectual capital. In the same way, previous scholars found that the pedagogic leader demonstrated credible knowledge of learning and teaching in conjunction with knowledge of the processes for improving school-wide learning by fostering focused communities, authentic assessment (academic capital) (Macneill *et al.*, 2005; Sergiovanni, 1998, 2001). In line with the present study, the pedagogical school principals created a school culture that respects teachers' instructional decisions, valued teachers' professional judgment and wisdom, encouraged teachers to make sound instructional decisions and assessed their instructional decisions (professional and intellectual capital) (Hargreaves, 2016). This result is also in line with Sergiovanni's model (1998) of the intercorrelated four core (or basic) dimensions (social, academic, intellectual and professional capitals) of PLS.

Relationship between primary school principals' practices of pedagogical leadership and teachers' psychological empowerment

Since PL practice and psychological empowerment are similar in nature, correlation analysis is used as a means to check discriminant validity in Table 7.

The correlation output revealed that dimensions of PL (social, academic, intellectual and professional capital) shows a positive and meaningful relationship with psychological empowerment. In this respect, it can be said that the increase of social, academic, professional and intellectual capital in schools will lead to an increase in teachers' perception of their psychological empowerment (goal internalization, meaning, influence and competence). In line with the present study, Lee and Nie (2016), Pada and Wahyudin (2023) and Nuzul *et al.*

Factors	1	2	3	4
1. Social capital	1			
2. Professional capital	0.667**	1		
3. Intellectual capital	0.574**	0.572**	1	
4. Academic capital	0.612**	0.578**	0.573**	1

Note(s): **Correlation is significant at the 0.01 level (2-tailed)
*Correlation is significant at the 0.05 level (2-tailed)
Source(s): Authors' own work

Table 5.
Intercorrelations of dimensions measures of psychological leadership scale ($N = 470$)

Dimensions	Beta	Standardized β	Standard error	t
Pedagogical leadership → Social capital	0.841	0.887	0.021	39.249**
Pedagogical leadership → Professional capital	0.805	0.913	0.018	45.621**
Pedagogical leadership → Intellectual capital	0.715	0.868	0.02	35.707**
Pedagogical leadership → Academic capital	0.807	0.888	0.02	39.455**

Note(s): Significant 2 tailed**
Source(s): Authors' own work

Table 6.
Model path coefficients analysis results

(2020) found that leaders have a positive effect on employee empowerment. Thus, the scale has a good construct and divergent validity.

To examine the differentiation capacity of the new PLS, an independent sample t-test was utilized. As in Table 8, there was a significant difference between female and male teachers on principals' practice of social capital [t (96.11) = −2.210, p < 0.05]. The view of female teachers about principals' practice of social capital ($\overline{x}$ = 3.9372) was significantly greater than male teachers ($\overline{x}$ = 3.6717). The magnitude of the differences in the means (mean difference = −0.26546) at 95% CI: 0.50386 to −0.02706. As Cohen's (1988) suggestion indicates (d = 0.20, 0.50 and 0.80 for small, medium and large effects, respectively), the result of the effect size for social capital was (d = − 0.302) is labeled moderate, implying that the obtained that the group means differ by 0.302 standard deviations and, indicating that gender affected the perception of teachers on the practice of principals to develop the social capital of students by forming various social interaction with school stakeholders at moderate level. This means the scale has a good divergent validity. However, there were no significant differences due to gender about principals' practice of professional capital, intellectual capital, academic capital dimensions and general PL.

The scale of PL is crucial when it comes to educational leadership and management. The PLS adopts a more comprehensive strategy by emphasizing managing and creating knowledge in real-world context rather than just imparting it and by taking into account the setting, people and the development of knowledge. This PLS emphasizes the direct impact of school principals on the process of teaching and learning and social behavior (students' academic and social capital) as well as the indirect impact, which is focused on the supply of resources to facilitate the implementation of quality education, competency management and the creation of a conducive learning environment. The way principals oversee activities that help teaching staff members become competent and grow their professional and intellectual capital is an example of indirect PL. Therefore, the PLS is very important because it emphasizes knowledge creation and management, adds to the overall effectiveness of learning organizations and advances existing scholarship in the leadership context. To sum

Table 7.
Correlation analysis of primary school teachers' perception pedagogical leadership and psychological empowerment (discriminant validity)

	Social capital	Academic capital	Intellectual capital	Professional capital
1. Goal internalization	0.365**	0.397**	0.382**	0.344**
2. Meaning	0.394**	0.407**	0.384**	0.446**
3. Influence	0.425**	0.490**	0.427**	0.410**
4. Competence	0.329**	0.317**	0.271**	0.297**

Source(s): Authors' own work

Table 8.
Differences in teachers' perceptions of primary school principals' practice of pedagogical leadership due to gender

Dimensions	Gender	$\overline{x}$	S	t	Df	p
Social capital	Male	3.6717	0.93345	−2.210	96.111	0.029
	Female	3.9372	0.86669			
Professional capital	Male	3.6854	0.98543	−1.529	418	0.127
	Female	3.8739	0.93916			
Intellectual capital	Male	3.4507	1.03632	−1.842	418	0.066
	Female	3.6934	1.00727			
Academic capital	Male	3.8338	0.94051	−1.278	418	0.202
	Female	3.9868	0.91535			
Pedagogical leadership	Male	3.6604	0.85746	−1.957	418	0.051
	Female	3.8728	0.82901			

Source(s): Authors' own work

up, PL emphasizes knowledge, connections and comprehensive approaches to educational leadership, going beyond standard paradigms of education leadership and management. As a result, the PLS is an effective tool for evaluating and improving leadership techniques in educational settings. From a methodological standpoint, its validity and reliability make it an invaluable resource for comprehending and advancing successful educational leadership.

Conclusions, recommendations and implications

In this study, to develop and validate PLS, initially, the relevant literature was reviewed. Then qualitative data were collected through interviews with 14 participants. Participant responses were organized under 40 themes, later on, analyzed using EFA, as a result, the measuring scale consists of 4 dimensions: Social capital, academic capital, professional capital and intellectual capital. The adequacy of the data for factor analysis was examined with the KMO coefficient (0.87) and Bartlett's Test of Sphericity Approximately Chi-Square $(SD = 496) = 7433,071, (p = 0.000)$. The instrument's total variance for the 4 factors (32 items) was 64.766%. The total Cronbach's alpha was 0.9. CFA out also revealed that RMSEA = 0.071, IFI = 0.98, NFI = 0.97, RFI = 0.97, NNFI = 0.98 and CFI = 0.98, GFI = 0.88 and AGFI = 0.85. All these values were accepted. Standardized path coefficients showed PL significantly affected all four dimensions such as social capital, academic capital, intellectual capital and professional capital. As a result of these findings, it can be concluded that the developed PLS is a valid and reliable measurement tool in the school setting.

The findings of the current research have numerous implications for principals in leading schools in Ethiopia and countries with similar educational systems and challenges by equipping them to develop crucial benchmarking strategies and reasonable goals and effectively evaluate their practice of PL on a regular basis. Recently, school principals are considered pedagogical leaders, but there is no such instrument that can evaluate the PL practices in a local context. Therefore, this study filled some gaps by developing comprehensive PL dimensions and items. This makes the principals transform their leadership behavior to be more pedagogical by improving their abilities in leading teaching and learning through PL theories that are new alternative strategies in the educational sector. This scale also assists school principals with self-evaluation and peer evaluation that work with similar age students and similar contexts in order to keep the philosophy aligned throughout what schools do.

The instrument can also play a significant role in helping the Ministry of Education, teachers, educational researchers, educational administrators and other relevant school stakeholders to promote pedagogical knowledge and information to increase school effectiveness and learning outcomes. Furthermore, this will also give knowledge to the present literature on PL practice and could be used for more studies. It is crucial that future studies should conduct studies to figure out how the practice of PL is affecting classroom effectiveness, the overall aims of schools, and how this scale reflects practice in working with students of various ages. The PL instrument proved validity and reliability within the framework of this study. However, further refinement of this instrument is recommended. This study can also expand by including different provinces, stakeholders (e.g. principals), regions and countries with a broader range of demographics.

References

Abel, M. (2016), "Why pedagogical leadership? McCormick center: for early childhood leadership", available at: https://mccormickcenter.nl.edu/library/why-pedagogical-leadership

Abu Nasra, M. and Arar, K. (2020), "Leadership style and teacher performance: mediating role of occupational perception", *International Journal of Educational Management*, Vol. 34 No. 1, pp. 186-202, doi: 10.1108/IJEM-04-2019-014.

Adu, P. (2019), *A Step-by-Step Guide to Qualitative Data Coding*, Routledge, Oxfordshire.

Aguilar, S.M. (2020), "Triangulation and trustworthiness- Advancing research on public service ınterpreting through qualitative case study methodologies", *FITISPos International Journal*, Vol. 7 No. 1, pp. 31-52, doi: 10.37536/fitispos-ij.2020.7.1.249.

Akgül, A. and Çevik, O. (2003), *Statistical Analysis Techniques: Operational Applications in SPSS*, Emek Ofset, Ankara.

Alava, J., Halttunen, L. and Risku, M. (2012), *Changing School Management. Finnish National Board of Education*, available at: http://www.oph.fi/download/146781Changing_school_management.pdf

Anderson, J.C. and Gerbing, D.W. (1988), "Structural equation modeling in practice: a review and recommended two-step approach", *Psychological Bulletin, American Psychological Association*, Vol. 103 No. 3, pp. 411-423, doi: 10.1037//0033-2909.103.3.411.

Arlestig, H. and Törnsen, M. (2014), "Classroom observations and supervision– essential dimensions of pedagogical leadership", *International Journal of Educational Management*, Vol. 28 No. 7, pp. 856-868, doi: 10.1108/IJEM-01-2014-0001.

Berhanu, K.Z. (2023), "Development and validation of teachers' psychological empowerment scale in Ethiopian context", *Management in Education*, pp. 1-9, doi: 10.1177/08920206231215264.

Bhatti, W. and Zahee, A. (2014), "The role of intellectual capital in creating and adding value to organizational performance: a conceptual analysis", *The Electronic Journal of Knowledge Management*, Vol. 12 No. 3, pp. 187-194.

Brown, T.A. (2015), *Confirmatory Factor Analysis for Applied Research*, 2nd ed., The Guilford Pres, New York.

Burden, P.R. (2003), *Classroom management:Creating a Successful Learning Community*, John Wiley & Sons, New York.

Bush, T. (2008), *Leadership and Management Development in Education*, SAGE Publications, London.

Büyüköztürk, Ş. (2003), *Data Analysis Handbook for Social Sciences: Statistics, Research Design, SPSS Applications and Interpretation*, Pegem, A. Publications, Ankara.

Carpenter, S. (2018), "Ten steps in scale development and reporting: a guide for researchers", *Communication Methods and Measures*, Vol. 12 No. 1, pp. 25-44, doi: 10.1080/19312458.2017.1396583.

Cheng, E. (2015), "Knowledge sharing for creating school intellectual capital", *Procedia- Social and Behavioral Sciences*, Vol. 191, pp. 1455-1459, doi: 10.1016/j.sbspro.2015.04.307.

Churchill, G.A. and Iacobucci, D. (2002), *Marketing Research: Methodological Foundation*, 8th ed., South-Western Publishing Company, TN.

Cohen, J. (1988), *Statistical Power and Analysis for the Behavioral Sciences*, 2nd ed., Lawrence Erlbaum Associates, Hillsdale, NJ.

Cohen, L., Manion, L. and Morrison, K. (2018), *Research Methods in Education*, 8th ed., Taylor & Francis Group, Oxfordshire.

Çokluk, Ö., Şekercioğlu, Ğ. and Büyüköztürk, Ş. (2010), *Sosyal bilimler Için Çok Değişkenli Istatistik: SPSS Ve LISREL Uygulamaları [Applications of Multivariate Statistics SPSS and LİSREL for Social Sciences]*, Pegem Akademi, Ankara.

Coleman, S.J. (1988), "Social capital in the creation of human capital", *The American Journal of Sociology*, Vol. 94, pp. 95-120, doi: 10.1086/228943.

Collier, J.E. (2020), *Applied Structural Equation Modeling Using AMOS: Basic to Advanced Techniques*, Routledge, New York, doi: 10.4324/9781003018414.

Contreras, T. (2016), "Pedagogical leadership, teaching leadership and their role in school improvement: a theoretical approach", *Propósitos y Representaciones*, Vol. 4 No. 2, pp. 231-284, doi: 10.20511/pyr2016.v4n2.123.

DeVellis, R.F. (2017), *Scale Development: Theory and Applications*, Sage Publications, Los Angeles, CA.

Emmanuel, S. and Valley, C.A. (2021), "A qualitative case study of exemplary principal leadership in the United States virgin islands: an application of Kouzes and Posner's five practices of exemplary leadership", *Journal of Research on Leadership Education*, Vol. 17 No. 3, pp. 243-264, doi: 10.1177/1942775121990054.

Field, A. (2009), *Discovering Statistics Using SPSS*, 3rd ed., Sage, London.

Fonsén, E. and Soukainen, U. (2020), "Sustainable pedagogical leadership in Finnish Early Childhood Education (ECE): an evaluation by ECE professionals", *Early Childhood Education Journal*, Vol. 48 No. 2, pp. 213-222, doi: 10.1007/s10643-019-00984-y.

Fullan, M. (2001), *Leading in a Culture of Change*, Jossey-Bass, San Francisco.

Gaetz, S. (2016), "Caring community of learners. Texas child care", *Quarterly*, Vol. 40 No. 2, pp. 1-6, available at: https://www.childcarequarterly.com/.../fall16_community

García-Martínez, I. and Tadeu, P. (2018), "The influence of pedagogical leadership on the construction of professional identity: systematic review", *Journal of Social Studies Education Research*, Vol. 9 No.3, pp. 145-162, doi: 10.17499/jsser.90982.

Hair, J.F. Jr, Sarstedt, M., Matthews, L.M. and Ringle, C.M. (2016), "Identifying and treating unobserved heterogeneity with FIMIX-PLS: part I–method", *European Business Review*, Vol. 28 No. 1, pp. 63-76, doi: 10.1108/ebr-09-2015-0094.

Hair, J.F., Hult, G.T.M., Ringle, C.M., Sarstedt, M., Danks, N.P. and Ray, S. (2021), "An introduction to structural equation modeling", in *Partial Least Squares Structural Equation Modeling (PLS-SEM) Using R. Classroom Companion: Business*, Springer, Cham, pp. 1-29, doi: 10.1007/978-3-030-80519-7_1.

Hargreaves, A. (2016), "The place for professional capital and community", *Journal of Professional Capital and Community*, Vol. 1 No. 1, doi: 10.1108/JPCC-11-2015-0010.

Heikka, J. (2014), *Distributed Pedagogical Leadership in Early Childhood Education*, Tampere University Press, Tampere.

Heikka, J. and Waniganayake, M. (2011), "Pedagogical leadership from a distributed perspective within the context of early childhood education", *International Journal Leadership in Education*, Vol. 14 No. 4, pp. 499-512, doi: 10.1080/13603124.2011.577909.

Holzmann, G.J. (1996), *The State of Spin: In Lecture Notes in Computer Science*, Springer, NM.

Jäppinen, A.K. (2012), "A professional learning community promotes the empowerment of the whole staff", *International Journal of Educational Research*, Vol. 53 No. 1, pp. 182-193, doi: 10.1016/j.ijer.2012.03.005.

Kesari, F., Khah, H. and Kesari, F. (2017), "Intellectual capital of organization and psychological empowerment of employees", *Sindhological Studies*, Vol. 1, pp. 93-98.

Knapp, M., Copland, M. and Talbert, J. (2003), *Leading for Learning*, WA: Center for the Study of Teaching and Policy, Seattle.

Lamm, K.W., Lamm, A.J. and Edgar, D. (2020), "Scale development and validation: methodology and recommendations", *Journal of International Agricultural and Extension Education*, Vol. 27 No. 2, pp. 24-35, doi: 10.5191/jiaee.2020.27224.

Lee (2016), "Pedagogical leadership to support new teachers' growth", Unpublished Master's Thesis, University of Jyväskylä, Jyväskylä, Finland.

Lee, A.N. and Nie, Y. (2016), "Teachers' perceptions of school leader empowering behaviors on psychological empowerment: a moderated path analysis. New Waves", *Educational Research and Development*, Vol. 19 No. 2, pp. 36-58, doi: 10.1177/1741143215578448.

Leech, N., Barrett, K. and Morgan, B.A. (2015), *SPSS for Intermediate Statistics: Use and Interpretation*, 5th ed., Routledge, Oxfordshire.

Lunenburg, F. and Ornstein, A. (2004), *Educational Administration: Concepts and Practices*, 4th ed., Thomas Learning Academy, Denver, CO.

Macneill, N., Cavanagh, R. and Silcox, S. (2003), "Beyond instructional leadership: towards pedagogical leadership", *Annual conference for the Australian Association for Research in Education*, Auckland, pp. 1-11.

Macneill, N., Cavanagh, R. and Ballajura, S. (2005), "Pedagogic leadership: refocusing on learning and teaching", *International Electronic Journal for Leadership in Learning*, Vol. 9 No. 2, pp. 1-11.

Manen, M.V. (1991), *The Tact of Teaching: the Meaning of Pedagogical Thoughtfulness*, State University of New York Press, Albany.

Marr, B., Gray, D. and Neely, A. (2003), "Why do firms measure their intellectual capital?", *Journal of Intellectual Capital*, Vol. 4 No. 4, pp. 441-464, doi: 10.1108/14691930310504509.

Messick, S. (1989), "Validity", in Linn, R.L. (Ed.), *Educational Measurement*, 3rd ed., Macmillan, New York, pp. 13-103.

Mihas, P. and Institute, O. (2019), "Learn to use an exploratory sequential mixed method design for instrument development", in *SAGE Research Methods Datasets Part 2*, Sage Publications, London, pp. 1-40, doi: 10.4135/9781526496454.

Mindich, D. and Lieberman, A. (2012), *Building a Learning Community: A Tale of Two Schools*, Stanford Center for Opportunity Policy in Education, Stanford, CA.

Modise, M.R. (2019), "Pedagogical leadership in early childhood development: a means for quality practices through professional training", *Glocal Education in Practice: Teaching, Researching, and Citizenship*, Vol. 17, pp. 117-123.

MoE (2017), "Ethiopian education development roadmap (2017-30): an integrated executive summary", Addis Ababa, Ethiopia.

Nahapiet, J. and Ghoshal, S. (1998), "Social capital, intellectual capital, and organizational advantage", *Academy of Management Review*, Vol. 23 No. 2, pp. 242-266, doi: 10.2307/259373.

Newmann, F., King, B. and Carmichael, D. (2007), *Authentic Instruction and Assessment: Common Standards for Rigor and Relevance in Teaching Academic Subjects*, Iowa Department of Education, State of Iowa, USA.

Nuzul, A., Witjaksono, A.D. and Kistyanto, A. (2020), "Empowering leadership and employee creativity: the mediating role of psychological empowerment", *SEISENSE Journal of Management*, Vol. 3 No. 6, pp. 14-25, doi: 10.33215/sjom.v3i6.467.

Okoth, T. (2016), "Enhancing pedagogical leadership: refocusing on school practices", *Journal of Humanities and Social Science*, Vol. 21 No. 2, pp. 18-21, doi: 10.9790/0837-21261821.

Ord, K., Mane, J., Smorti, S., Carroll-Lind, J., Robinson, L. and Armstrong-Read, A. (2013), *Developing Pedagogical Leadership in Early Childhood Education*, NZ Childcare Association, Wellington.

O'Brien, A. (2005), "An exploration of the perceptions and experiences of leadership by teachers and their opportunities for leadership development", Unpublished Doctoral dissertation, Australian Catholic University, Melbourne.

Pada, A.T. and Wahyudin, A. (2023), "The mediating role of psychological empowerment and creative process engagement on the influence of leadership empowerment and creativity: case study of CPNS lecture's", *Jurnal Ekonomi*, Vol. 12 No. 1, pp. 799-805, available at: http://ejournal.seaninstitute.or.id/index.php/Ekonomi/article/view/1281

Peng, D. and Vašťatková, J. (2015), "Changing policy, legislation and its effects on pedagogic leadership in China", *The European Journal of Social and Behavioural Sciences*, Vol. 17 No. 3, pp. 2115-2130, doi: 10.15405/ejsbs.190.

Schermelleh-Engel, K., Moosbrugger, H. and Müller, H. (2003), "Evaluating the fit of structural equation models: tests of significance and descriptive goodness of fit measures", *Methods of Psychological Research Online*, Vol. 8 No. 2, pp. 23-74, available at: https://psycnet.apa.org/record/2003-08119-003

Sergiovanni, T.J. (1998), "Leadership as pedagogy, capital development, and school effectiveness", *International Journal of Leadership in Education*, Vol. 1, pp. 37-46, doi: 10.1080/1360312980010104.

Sergiovanni, T.J. (2001), *Leadership: What is in it for Schools?*, Routledge Farmar, London and New York.

Shields, C.M. (2010), "Transformative leadership: working for equity in diverse Contexts", *Educational Administration Quarterly*, Vol. 46 No. 4, pp. 558-589, doi: 10.1177/0013161X10375609.

Shields, C.M. and Hesbol, K.A. (2020), "Transformative leadership approaches to inclusion, equity, and social justice", *Journal of School Leadership*, Vol. 30 No. 1, pp. 3-22, doi: 10.1177/1052684619873343.

Spreitzer, G. (1995), "Psychological empowerment in the workplace: dimensions, measurement, and validation", *The Academy of Management Journal*, Vol. 38 No. 5, pp. 1442-1465, doi: 10.2307/256865.

Tay, L. and Jebb, A. (2017), "Scale development", in Rogelberg, S. (Ed.), *The SAGE Encyclopedia of Industrial and Organizational Psychology*, 2nd ed., Sage, Thousand Oaks, CA.

Thomas, K. and Velthouse, B. (1990), "Cognitive elements of empowerment", *Academy of Management Reveiw*, Vol. 15 No. 4, pp. 666-681, doi: 10.2307/258687.

Tsang, K. (2009), "School social capital and school effectiveness", *Education Journal*, Vol. 37 Nos 1-2, pp. 119-136.

Vinzi, V.E., Chin, W.W., Henseler, J. and Wang, H. (2010), "PLS path modeling: from foundations to recent developments and open issues for model assessment and improvement", in *Handbook of Partial Least Square. Business*, Springer, pp. 47-82, doi: 10.1007/978-3-540-32827-8.

Webb, R. (2005), "Leading teaching and learning in the primary school: from 'educative leadership' to 'pedagogical leadership'", *Educational Management Administration and Leadership*, Vol. 33 No. 1, pp. 69-91, doi: 10.1177/1741143205048175.

Wiersma, W. and Jurs, S.G. (2005), *Research Methods in Education*, 8th ed., Allyn and Bac, Boston.

Further reading

Kaplan, S. (2014), "Social covenants and social contracts in transitions", NOREF report, Norwegian, available at: https://noref.no/Publications/Themes/Peacebuilding-and-mediation/Social-covenants-and-social-contracts-in-transitions

Wang, C. and Mowen, J. (1997), "The separateness-connectedness self-schema: scale development and application to message construction", *Psychology Aand Marketing*, Vol. 14 No. 2, pp. 185-207, doi: 10.1002/(SICI)1520-6793(199703)14:2<185::AID-MAR5>3.0.CO;2-9.

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