The Spiral Internal Laboratory at Sakhnin College, Israel: PD for education supervisors, mentors and students

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This study's primary aim was to assess the role of Sakhnin College's internal laboratory, known as "Spiral", in the professional development of educational supervisors within learning communities. Additionally, it sought to determine the extent of Spiral's contribution to the professional growth of these supervisors and explore whether there were any significant differences based on variables such as gender, age, and teaching subject specialisation. Utilising a descriptive approach and a questionnaire, data collected from 32 expert, state licensed educational supervisors revealed that the laboratory played a significant role in enhancing the professional development of educational supervisors. Notably, the sub-field "development of pedagogical tools and products" garnered the highest score while "cooperative teaching in pairs" scored the lowest. Our study found no statistically significant differences among respondents based on gender, age, or specialisation. Recommendations and suggestions based on our findings are offered.

Introduction: Situating the study

Teacher preparation relies heavily on clinical experience in educational institutions, which encompasses professional growth and lifelong learning. Pedagogical guidance is crucial in developing novice educators' practical knowledge and reflective skills, surpassing the notion that teaching skills can be learned solely through observation. Effective pedagogical mentorship is key to optimising educators' clinical experiences and bridging the gap between academic standards and real-world practice.

Sakhnin College's "Internal Laboratory", formally called the "Spiral Internal Laboratory", is a professional development program designed to improve the skills of instructional supervisors in learning communities. The program's name "Spiral" refers to its reflective, iterative approach to professional development, in which participants examine and improve their methods on a regular basis. The word "internal" emphasises how the program is a crucial component of Sakhnin College, utilising in-house resources, knowledge, and a controlled setting to assist participants' professional growth. This guarantees that the training is closely in line with the community's requirements and the unique educational circumstances of the college.

The Spiral Internal Laboratory functions as an initiative that promotes reflective practice, action research, and peer observation through a sequence of workshops, seminars, and cooperative projects. Through these exercises, educational supervisors can practise cooperative teaching, build and improve their pedagogical tools, and hone their supervisory abilities. Supervisors can gain quick feedback, put their theoretical knowledge to use in real-world situations, and continue to develop professionally by taking part in these structured events. In addition to typical practice teaching, the curriculum offers simulated teaching environments that let learners try out new techniques in a safe context.

Pedagogical guidance is an ongoing process where an experienced individual, often referred to as a pedagogical mentor or teacher educator, assists less experienced individuals, typically future teachers, in developing professional behaviour and a teacher identity. Three main approaches to pedagogical guidance have been identified: The *Theory-Practice Integration Approach* integrates research findings, practical knowledge, and professional skills for holistic teaching; the *Knowledge Transmission Approach* relies on research findings rather than solely on the mentor's practices.

Research on pedagogical supervision places a strong emphasis on developing trainee relationships, enhancing communication, and offering new teachers emotional support. Pedagogical mentors are essential in assisting novice educators in critically analysing their experiences and actively participating in dialogues about pedagogy to produce useful guidelines. By providing tools based on principles for practical situations, they bridge the gap between academic theory and educational environments. Pedagogical mentors also support learners' personal development, integrate knowledge and reflection, and facilitate training assessment. They greatly aid in the growth of collaborative learning communities in education by establishing human relationships and business alliances with academic institutions.

In many instances, the pedagogical mentor assumes the dual role of fostering the professional and personal development of both prospective educators and fellow academic colleagues. This nurturing approach promotes active and collaborative learning, necessitating the application of cooperative skills and teamwork. Group work cultivates empathy and a shared sense of responsibility, facilitating the development of tools and solutions for training, the analysis of on-site dilemmas and challenges, and the provision of effective coping strategies (Darling-Hammond et al., 2020).

Optimal clinical experience is an essential condition for the professional development of prospective educators for both instruction and field practice. The practical knowledge exposed during the guidance process and evaluation conversations is event-focused, contextually rooted, and geared towards investigating practice (Furlong, 2013).

Professional, personal, and collective development are fostered through diverse opportunities for learning, contributing to the construction of content knowledge, practical skills, and instructional improvement. Research literature indicates that teachers learn best when their learning is grounded in instructional practices within an educational environment that is sustained, encourages collaboration with peers within and outside the school, facilitates reflection, and cultivates cognitive knowledge and skills necessary for enhancing instruction (McLaughlin & Talbert, 2006).

Our research focuses on the creation of the internal laboratory "Spiral" at a college in Sakhnin, emphasising the development and integration of pedagogical resources to enhance clinical encounters in response to evolving field demands. The objective is to elevate pre-service educators' professionalism through continuous professional development (CPD) and lifelong learning.

Review of literature

Continuous professional development

The expanding responsibilities of pedagogical mentors in recent years have been highlighted by numerous pedagogical guidance models across the globe, including peer mentoring, community building, fostering school culture, educational leadership, and research (Mena et al., 2017). However, a formal framework for pedagogical guidance that systematically specifies different roles and clarifies the division of responsibilities between pedagogical mentors and other specialist facilitators is urgently needed. Additionally, it is highlighted how critical it is to get direction, feedback, and evaluation during practical experiences because these are crucial instruments for gaining advanced professional knowledge, coming to meaningful conclusions, and strengthening reflective abilities.

The Spiral Internal Laboratory at Sakhnin College offers an integrated platform for professional growth and real-world application, which is crucial for the support of formal academic programs including MTeach, and BEd. While these degrees provide a strong theoretical foundation and demanding coursework, the Spiral Internal Laboratory enhances this education by providing opportunities for experiential learning that bridges the theory and practice gaps. Through organised activities like workshops, seminars, and group projects, students can apply their theoretical knowledge in real-world scenarios, which improves their educational experience and better equips them for their professional responsibilities.

Focused interventions that align with specific learning outcomes of the several units of study required for the BEd and MTeach degrees are offered by the Spiral Internal Laboratory. For example, during a unit on educational leadership, students can work on projects in the lab where they apply what they've learned in the classroom through peer mentorship or action research (Marsden, 2017). This alignment ensures that the laboratory's activities are both necessary and complementary to the academic curriculum, which provides a smooth and comprehensive learning experience.

The Spiral Internal Laboratory also addresses the need for on-campus practice teaching simulations to complement traditional practicum experiences in local or regional institutions (Avendano et al., 2019). These internal simulations are important for Sakhnin College because they provide a supportive and safe environment for students to practise teaching before courses begin. With the ability to simulate numerous classroom scenarios and receive quick feedback, students can gain experience with a variety of teaching styles and strategies. Their self-assurance and preparedness to teach in the real world are boosted by this. This approach ensures a more comprehensive preparation for practice teaching, which ultimately leads to better learning outcomes.

In contrast to traditional methods where teachers solely impart knowledge, many teacher education programs in academic universities now embrace active, collaborative, relevant, and constructivist learning approaches. In these advanced methodologies, teachers take on diverse roles such as mentoring, facilitating, mediating, enabling, and fostering teamwork

and communication skills among students (Gledson & Dawson, 2017). They also promote an appreciation for the learning process. To underscore a learner-centred and participative approach, students are tasked with demonstrating self-directed learning motivation, establishing their learning objectives, and assessing the quality of their work (Darling-Hammond, 2006).

According to Darling-Hammond (2006), teacher education institutions, through pedagogical mentors, must develop suitable curriculum plans, tools, and skills to help students acquire a wide variety of essential foundations—skills that are critical for meaningful learning and socio-cultural connections within communities. This contributes to their lifelong professional development.

Reflective dialogue and practice inquiry

The promotion of reflective processes and instructional enhancement within communities can yield significant benefits by fostering a culture of deep dialogue (Dobie & Anderson, 2015; Hadar & Brody, 2010; Stoll et al., 2006). In-depth peer conversations are facilitated by various integrated circumstances, as evidenced in research on critical discourse in professional learning communities in the United States (Kintz et al., 2015). This study underscores three crucial factors for enhancing teachers' engagement in substantive debate: "... a clear purpose, coach questioning, and the connection of theory to practice." (Kintz et al., 2015, p.121)

Practice inquiry, a systematic cyclical process involving data collection, goal-setting, activity implementation, intervention assessment, and feedback, enriches educational insight and supports professional development (Bradbury, 2015). Discussions on pedagogical justifications are pivotal for gaining a professional perspective on teaching, enabling educators to identify and address the unique complexities of their work (Loughran, 2019). By grounding this process in rich representations from real-world teaching experiences, educators can comprehensively analyse learners' cognitive processes and the relationship between instructional planning and learning outcomes, significantly contributing to ongoing growth and refinement in practice (Horn, 2010; Lefstein et al., 2020).

Professional language utilisation involves using specialised terms to describe teaching and learning processes and bridging theoretical concepts to practical applications. Frame of action, long adopted as a productive approach, entails adopting an inventive perspective and contemplating future implementation (Vedder-Weiss et al., 2018). Multiple viewpoints and productive tension among them are maintained, encouraging discourse that exposes diversity in perspectives, conflicting opinions, challenges to ideas, and different modes of action (Grossman et al., 2001).

Development of pedagogical tools and artefacts for experiential teaching

Experiential learning founded upon the development of knowledge and instructional processes is a cornerstone in teacher training within the Academy Class model (Nissim &

Naifeld, 2024). In a learning community, the assumption is that learning occurs solely through experimentation and action, which constitute the cornerstones of constructing new knowledge (Kolb, 1984).

Metacognition is pivotal in learning laboratories, serving as a resource where individuals reflect on their behaviours both inside and outside the classroom, thereby heightening awareness of relevant elements. These metacognitive processes are integral at all stages of teaching and learning, facilitating meaningful learning from planning through implementation and reflection. Small-group discussions and learning communities are instrumental in fostering awareness of these processes. In learning communities, metacognitive guidance leads to enhanced interdisciplinary outcomes, deeper pedagogical and content understanding, and increased learning retention, as indicated by recent studies in teacher professional development (Prytula, 2012). Community members believe that exposure to a wide range of school-based situations enhances comprehension of various learning components, including knowledge and skill acquisition, as well as the development of processes, behaviours, values, motivation, and other professional and social components (Murad et al., 2022).

Co-teaching instruction

High-quality educator preparation is crucial for impacting children's cognitive and emotional development. Co-teaching, where an experienced teacher collaborates with a student teacher in a regular classroom, enhances learning opportunities and fosters a multi-perspective environment (Cook & Friend, 1995). This approach promotes professional growth as mentors and students engage in collaborative practice, enriching clinical exposure (Murphy & Martin, 2015). Implementing a professional development process within learning communities further maximises the benefits of the co-teaching model (Guise et al., 2017). The advantages of co-teaching include improved learning experiences for students and enhanced personal teaching expression, as evidenced in professional literature and collective discussions (Cook & Friend, 1995).

1. Partnership level: Collaboration between the teacher and the student in classroom instruction across its various stages—planning, execution, and reflection—creates an opportunity for analysing the decision-making rationale underlying planning and execution. This promotes insights for further enhancement.

2. Teacher level: Co-teaching offers teachers an opportunity to rethink their instruction, emphasising exposure to the decision-making processes underpinning their diverse decisions and fostering renewed reflective thinking (Gallo-Fox & Scantlebury, 2016).

3. Student level: The student gains experience in guiding and planning instruction, gradually acquiring classroom management skills. Effective co-teaching empowers the student and allows for collaborative thinking with an expert teacher throughout the instructional process—lesson planning, execution, assessment development, material creation, and learning environment establishment (Austin, 2001).

At the student level, exposure to different teaching styles, communication approaches, a variety of skills, competencies, and knowledge enhances learning experiences. Co-teaching offers numerous areas of interest for students, providing an additional figure to identify with. Alongside the benefits of co-teaching, certain challenges arise.

Social-emotional learning

The development and utilisation of emotional, social, and behavioural skills are integral for success across various life domains, encompassing social-emotional learning (Baumeister, 2012; Reeve et al., 2014). This aspect of education and human development promotes personal growth, empowerment, and mental well-being for all participants, including students and teachers, by fostering resilience and supporting potential within a community. Businesses and educational systems worldwide emphasise the importance of social-emotional learning due to its significance in adapting to global changes. However, teachers may face challenges in delivering effective social-emotional education and serving as role models for acceptable behaviours if they lack awareness of their own emotions and those of their students (Vansteenkiste & Ryan, 2013).

The development of skills and content related to social-emotional learning in a framework such as an internal college laboratory by pedagogical mentors is a vital element for the professional development of the teacher community. This allows them to serve as models and influence the promotion of social-emotional learning among students within schools. This process creates a spiral experience where the satisfaction of needs, motivation, and constructive actions reinforce each other (Martella et al., 2021). Research demonstrates that various methods and supportive approaches from teachers and educators directly addressing students' needs and fostering positive self-perceptions significantly improve emotional quality (Ruzek et al., 2016).

Project-based learning

"21st-century skills" such as critical thinking, creativity, teamwork, entrepreneurship, and interpersonal communication are highly prized in today's information age. Project-based learning (PBL) encourages intrinsic motivation in the classroom by giving students the power to direct their own learning (Savery, 2015). Studies show that using PBL fosters students' social interaction and personal development. In addition to improving the emotional component of education, active student engagement also helps students connect with the institutional values and become more involved in its operations (Parsons & Taylor, 2012). Students' critical capacities are significantly enhanced by PBL and collaborative research-based pedagogies (Häkkinen et al., 2017).

Although PBL's effects on educators' knowledge and abilities have received the majority of attention in research, incorporating PBL into interdisciplinary courses is becoming more and more common (Kokotsaki et al., 2016; Tsybulsky et al., 2018). Nevertheless, the experiences of educators during PBL implementation have received less attention.

Our Spiral investigation (described below) included a special photo-voice project to thoroughly examine educators' experiences, attitudes, and practices during practical group work, to address this kind of gap. This method entails taking photos of areas that need improvement, documenting difficulties, improving collective accountability, and encouraging original problem-solving. This tactic encourages group cohesion and gives prospective educators the tools they need to handle interpersonal conflicts at work by utilising the positive dynamics of group interaction and fostering diversity.

Method

Research objective

The objective of our study is to examine the contribution of the Spiral Internal Laboratory at Sakhnin College (hereafter abbreviated to "Spiral"), to the professional development of educational supervisors in learning communities. This examination covers various dimensions, including the development of pedagogical tools and products, collaboration, paired instruction, practice exploration, and continuous professional development.

Research question and problem

- What is the contribution of Spiral to the professional development of educational supervisors?

Applied goals

- Developing a teaching product focused on socio-emotional capacities within the context of instructional processes, learning, and assessment. This aims to manage emotions, feel and demonstrate empathy towards others, establish supportive relationships, and make responsible and caring decisions.
- Developing a tool through a photo-voice activity that introduces and implements strategies for using images in practical work.

Instruments

Qualitative component
Personal open-ended feedback was collected from educational supervisors. Participants were asked to provide feedback and record their satisfaction and contributions resulting from their Spiral participation, in four thematic areas: development of pedagogical tools and products, collaboration and paired instruction, practice exploration, and continuous professional development. The open questions are provided in Appendix 1.

Quantitative component
A questionnaire was designed for examining the perceptions and attitudes of educational supervisors regarding their professional development resulting from their participation in Spiral. Responses to the questions were based on a 5-point Likert scale, ranging from 1 indicating low agreement to the presented option, to 5 indicating high agreement. The Likert scale items are presented in Tables 5 to 8.

Community

The sample comprised 32 faculty members who are government licensed educational supervisors in the targeted academic institutions. Table 1 shows the distribution according to their subject specialisations.

Table 1: Distribution of sample according to subject specialisation (N=32)

Subject	n	Percentage
English Language	6	18.75%
Arabic Language	6	18.75%
Mathematics	6	18.75%
Science	6	18.75%
Childhood	4	12.5%
Special Education	4	12.5%

An understanding of this phenomenon will be established, in addition to drawing conclusions and making generalisations that aid in the professional development of educational supervisors, thanks to a descriptive analytical approach, which describes the phenomenon as it actually occurs and expresses it quantitatively and qualitatively. The major tool used in this study to gather information about the study problem was a carefully designed questionnaire.

Validity of study tools

To verify the validity of the study tools, the following measures were considered:

1. As for the validity of the personal interview questions tool, the researchers experimented with the interview questions with three teachers from outside the study sample twice, and with an interval of two weeks between the first and second time. The answers did not show significant differences between the first time and the second time.

2. For the questionnaire about the contribution of Spiral, the validity of the tool was calculated by measuring internal consistency using Cronbach alpha (Table 2).

Table 2: Cronbach alpha method

Cronbach alpha	No. of items
0.947	21

It is clear from Table 2 that the stability coefficient (0.947) is strong, meaning that the study tool is suitable for this study because the correlation between the paragraphs of the tool is obviously solid.

Procedure

The investigation was conducted in a methodical manner, starting with a thorough analysis of the pertinent academic literature. To assure the integrity of the research, study tools were meticulously created. This was followed by a careful selection of participants, data collecting, in-depth analysis, and insightful conversations. The study concluded by offering pertinent recommendations in line with the research findings, emphasising the value of the research, particularly for faculty members at teachers' colleges such as establishing a thorough research framework.

Results

We begin by addressing the first research question through an analysis of open-ended questions. Subsequently, we apply statistical analysis using the SPSS program to investigate the second and third research questions. Table three shows estimates of the degree of satisfaction according to the quintuple scale.

Table 3: Estimates of the degree of satisfaction according to the quintuple scale

Response	Average	Length of period	Level
Strongly disagree	1.00 - 1.79	0.79	Low
Disagree	1.80 - 2.59	0.79	
Neutral	2.60 - 3.39	0.79	Average
Agree	3.40 - 4.19	0.79	High
Strongly agree	4.20 - 5.00	0.80	

Qualitative component results

Participants' (N=32) responses to our study's questions (Appendix 1) concerning the overarching question, "What is the contribution of Spiral to the professional development of educational supervisors?", are summarised in Appendix 1. It is evident that a substantial percentage of participants' responses were positive, highlighting various ways in which Spiral activities made significant contributions, including:

1. Fostering teamwork and collaboration at work.
2. Facilitating partnership in an in-vitro content development.
3. Enhancing teaching within teacher-student pairs during school experiences.
4. Serving as a practical environment for problem-solving, learning, and skill development during work processes.
5. Contributing to the development of reflective pedagogical skills.
6. Supporting continuing professional development.

The effectiveness and contributions of Spiral, as revealed in this study, align with findings from several previous studies, including those by Mena et al. (2017); Mena, Hennissen & Loughran (2017); Mena et al. (2016); Darling-Hammond et al. (2020); Furlong (2013), McLaughlin & Talbert (2006).

Quantitative component results

We analysed the questionnaire's quantitative data using mean values and standard deviations to obtain further insights into Spiral's contribution to the professional growth of educational supervisors within learning communities, both generally and within specific domains (Table 4). Note that in the detailed tables for individual domains (Tables 5 to 8), some items appear in more than one table.

Table 4: Means and standard deviations of the extent to which Spiral
contributes to PD for educational supervisors in learning communities as a
whole, and in each of its domains

Domain No.	Domain	Order	Mean	SD	Level
1	Development of pedagogical tools and products	1	3.51	0.67	High
2	Collaborative teaching in pairs	4	2.56	1.01	Low
3	Reflective educational discourse - a study of practice	3	3.048	0.92	Medium
4	Continuing professional development	2	3.052	0.94	Medium
	Average of levels		3.02	0.75	Medium

On average, the overall contribution level was "Medium", with a mean of 3.02 and a standard deviation of 0.75. "Development of pedagogical tools and products" stood out with the highest mean at 3.51, indicating a high contribution level. "Continuing professional development" and "Reflective educational discourse - a study of practice" fell within the "Medium" range, with means of 3.052 and 3.048, respectively. However, "Collaborative teaching in pairs" ranked lowest, with a mean of 2.56, suggesting a relatively lower contribution level.

Various factors influence Spiral towards a "Medium" level of professional development for educational supervisors in learning communities. These factors include challenges related to teachers, study materials, computer technologies, and equipment. Moreover, the suitability of course content for Spiral's activities may be insufficient, and an excess of material could impede effective utilisation. Consequently, Spiral's contribution only reached a "Medium" level. Additionally, the low score for "Collaborative teaching in pairs" may be attributed to difficulties in fostering student cooperation, often stemming from individual psychological factors. These findings align with previous studies, including that by Mena et al. (2017).

Domain 1: Development of pedagogical tools and products
Table 5 presents detailed findings for the 6 items comprising the first domain of Spiral's contribution to PD for educational supervisors in learning communities.

Table 5: Means and standard deviations of the domain of
development of pedagogical tools and products.

Item No.	Question	Order	Mean	SD	Level
6	The program enables the development of pedagogical materials in the service of clinical experience in the field	3	3.13	1.15	Medium
8	In the program pedagogical tools and products have been developed that will improve the quality of teaching, learning and evaluation processes	5	2.23	0.82	Low
9	In my opinion, the program enables all its partners to develop the skills necessary to deal with the special challenges among those training in teaching	2	3.31	0.68	Medium
16	The program increases the responsibility for developing integrative products to foster experience	1	3.49	0.92	High
20	In the program, I am able to cultivate skills by answering through experience	4	3	0.61	Medium
21	In the program I am able to cultivate skills by answering through experience	6	2.06	0.87	Low
	Average of levels		3.51	0.67	High

Table 5 provides a clear depiction of the "Development of pedagogical tools and products" domain, which achieved an average level of contribution. The total mean for this field was 3.51, with a standard deviation of 0.67. The means of individual paragraphs within this field varied, ranging from 2.06 to 3.49. These averages span the spectrum between low and high responses. Notably, item 16 emerged with the highest mean, 3.49. Item 21 attained the lowest mean, 2.06.

Domain 2: Collaborative teaching in pairs
Table 6 presents detailed findings for the 9 items comprising the second domain of Spiral's contribution to PD for educational supervisors in learning communities.

Table 6: Means and standard deviations of the domain of cooperative teaching in pairs

Item No.	Question	Order	Mean	SD	Level
2	The program enables joint dialogue and discussions to improve processes in the community	8	2.59	0.979	Low
3	The program allows each of its partners to contribute and benefit	7	2.93	1.226	Medium
5	The program contributes to the teamwork capacity of all its participants	2	3.19	0.78	Medium
10	The program promotes the openness of its partners to new and flexible experiences	6	2.94	1.25	Medium

12	The program allows me to improve my sense of self-efficacy	3	3.18	1.081	Medium
13	In my opinion, the program enables/ encourages joint planning and meaningful discussion	1	3.56	0.56	High
14	In my opinion, the program significantly improves the teaching experience	9	2.31	0.8	Low
15	The program develops professional identity and resilience that will help me lead a learning community	4	3.13	1.38	Medium
17	The program contributes to the flourishing of teacher training and the empowerment of trainees	5	3.03	1.107	Medium
	Average of levels		2.56	1.01	Low

Table 6 provides a clear indication that the domain of "Collaborative teaching in pairs" received a low rating. The total mean was 2.56, with a standard deviation of 1.01, while means for individual items ranged from 3.56 to 2.31, covering the full range from high to low responses. Remarkably, item 13 achieved the highest mean, 3.56. Item 14 was lowest at 2.31.

Domain 3: Reflective educational discourse - a study of practice
Table 7 presents detailed findings for the 11 items comprising the third domain of Spiral's contribution to PD for educational supervisors in learning communities.

Table 7: Means and standard deviations of the domain of
reflective educational discourse - a study of practice

Item No.	Question	Order	Mean	SD	Level
2	The program enables joint dialogue and discussions to improve processes in the community	10	2.59	0.979	Low
5	The program contributes to the teamwork capacity of all its participants	5	3.19	0.78	Medium
6	The program enables the development of pedagogical materials in the service of clinical experience in the field	7	3.13	1.15	Medium
7	The program enables continuous improvement in my interdisciplinary/ multidisciplinary skills	3	3.60	0.76	High
8	In this program, pedagogical tools and products have been developed, and will improve the quality of teaching, learning and evaluation processes	11	2.23	0.82	Low
9	In my opinion, the program enables all its participants to develop the skills necessary to deal with the special challenges among those training in teaching	4	3.31	0.68	Medium

10	In my opinion, the program promotes the openness of its partners to new and flexible experiences	8	2.94	1.25	Medium
11	The program enables the connection between theoretical and practical knowledge	9	2.89	1.079	Medium
12	I believe that learning, planning and evaluation in this program allow me to improve my sense of self-efficacy	6	3.18	1.081	Medium
18	The program enables all its partners to conduct an action research process on pedagogical processes carried out in schools	1	3.91	0.822	Medium
19	The program enables all its partners to conduct critical reflection to improve processes	2	3.84	0.797	High
	Average of levels		3.51	0.67	High

Table 7 shows that the domain "Reflective educational discourse - a study of practice" achieved a high rating, with an overall mean 3.51 and standard deviation of 0.67. Means for individual items ranged from 3.91 to 2.23, encompassing low, medium and high levels. Significantly, item 18 obtained the highest mean, 3.91. Item 8 secured the lowest mean, 2.23.

Domain 4: Continuing professional development
Table 8 presents detailed findings for the 9 items comprising the fourth domain of Spiral's contribution to PD for educational supervisors in learning communities.

Table 8: Means and standard deviations of the domain of continuing
professional development of pedagogical tools and products

Item No.	Question	Order	Mean	SD	Level
3	The program allows each of his partners to contribute and benefit	7	2.93	1.226	Medium
4	Spiral enables the study of problems that arise in clinical experience in the field	5	3.06	1.042	Medium
6	The program enables the development of pedagogical materials in the service of clinical experience in the field	4	3.13	1.15	Medium
8	In this program pedagogical tools and products have been developed that will improve the quality of teaching, learning and evaluation processes	9	2.23	0.82	Low
9	In my opinion, the program enables all its partners to develop the skills necessary to deal with the special challenges among those trained in teaching	2	3.31	0.68	Medium
11	The program enables the connection between theoretical and practical knowledge	8	2.89	1.079	Medium
12	I believe that learning, planning and evaluation in this program, allow me to improve my sense of self-efficacy	3	3.18	1.081	Medium

17	The program contributes to the enhancement of teacher training and the empowerment of trainees	6	3.03	1.107	Medium
19	The program enables all its partners to conduct critical reflection to improve processes	1	3.84	0.797	High
	Total grade		3.052	0.94	Medium

Table 8 illustrates that the domain "Continuing professional development" attained an average rating, with overall mean 3.052 and standard deviation 0.94. Within this domain, item means ranged from 3.84 to 2.23. The greatest mean was attained by Item 19, scoring 3.84. Item 8 with a mean of 2.23 was the lowest.

Statistical analyses

Some statistical analyses were used to consider potential factors such as gender, age, and subject specialisation. These included a t-test for the gender variable (Table 10) and a one-way ANOVA test to evaluate hypotheses relating to age and specialisation (Tables 11 and 12.)

Table 9: t-test results for independent samples of sample members' estimates of the contribution of Spiral to PD for educational supervisors due to the gender variable

	Itself	t
t-test - average responses of respondents	0.917782	-0.104101

Table 9 indicates no statistically significant differences at the significance level ($p = 0.05$) in the average responses to the questionnaire based on their gender.

Table 10: One-way ANOVA test for independent samples of the respondents' estimates of the contribution of Spiral to PD for educational supervisors due to the age variable

	Sum of squares	df	Mean square	F	Itself
Between groups	.132	2	.066	.068	.934
Within groups	28.126	29	.970		
Total	28.258	31			

Table 10 shows no statistically significant differences at the level of significance ($p = 0.05$) in the average responses to the questionnaire due to the age variable.

Table 11: One-way ANOVA test for independent samples of the
respondents' estimates of the contribution of Spiral to PD for educational
supervisors due to the specialisation variable

	Sum of squares	df	Mean square	F	Itself
Between groups	.413	5	.083	.077	.995
Within groups	27.845	26	1.071		
Total	28.258	31			

Table 11 shows no statistically significant differences at the level of significance (p = 0.05) in the average responses to the questionnaire due to the subject specialisation variable.

Discussion

Sakhnin College has significantly enhanced the professional development trajectories of its BEd and MTeach students by integrating Spiral into its academic structure. By providing a platform for practical application, the laboratory bridges the knowledge gap that exists between theoretical coursework and hands-on teaching experiences. In an experiential learning environment, students can apply and assess educational theories and concepts in a controlled atmosphere, strengthening their comprehension and developing their practical talents. Spiral's regular activities, which include lectures, seminars, and group projects, allow students to engage closely with the material. A more comprehensive and integrated learning process is the outcome.

Furthermore, Spiral's function in offering focused and pertinent professional development is highlighted by its alignment with specific units of study within various degree programs. For example, educational leadership projects at Spiral give students the chance to do action research and peer mentorship, which is closely related to their courses. In addition to reinforcing learning, this direct application of classroom knowledge to real-world situations improves students' capacity for critical analysis and self-reflection on their teaching methods. As a result of Spiral's ability to seamlessly integrate these real-world experiences with academic requirements, students are more equipped for their future careers as supervisors and educators.

Sakhnin College's distinctive learning environment emphasises the value of on-campus simulations, which are made possible via Spiral. Through the development and improvement of teaching abilities in a secure and encouraging environment, these simulations provide an essential supplement to traditional practicum experiences. Students benefit greatly from having the opportunity to try out different teaching strategies and get quick feedback, since this helps them become ready for the demands of real classrooms. By going through this preparatory phase, students can start their practice teaching in local or regional schools with greater competence and confidence.

Conclusion and implications

The study emphasises how important internal laboratories are to the professional development of teachers in educational institutions. By connecting theory and practice, laboratory work such as Spiral's improves instructor efficiency and amplifies experiential learning. Additionally, it encourages peer-to-peer information sharing and group learning, which significantly alters participants' cognitive and practical abilities. Regardless of gender, age, or specialty, statistical analysis revealed no discernible variations in the mean replies about Spiral's contribution to professional development at Sakhnin College. This suggests that the laboratory is a useful and practical resource that all supervisors can use.

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Appendix 1: Answers to the open questions

No.	Question	Major	No. of answers	Answers
1.	Have the pedagogical tools and products developed in the lab contributed to community work and experience? Please explain	English Language	6	All supervisors answered that they contributed
		Arabic Language	6	Two supervisors answered that they contributed and the rest answered that they did not use it
		Maths	6	All supervisors answered that they contributed
		Science	6	All the supervisors answered that it contributed, and some of them indicated that it is an essential part of school activities
		Childhood	6	All supervisors answered that they contributed
		Special Education	6	All supervisors answered that they contributed
2	Is there a partnership in content development during the lab? What is your contribution?	English Language	6	All supervisors answer that the partnership exists
		Arabic Language	6	All supervisors answer that the partnership exists
		Maths	6	All supervisors answer that the partnership exists
		Science	6	All supervisors answered that the partnership exists, and some indicated that participation allowed branching thinking, and this partnership worked on collaborative work in preparing products.
		Childhood	4	The supervisors showed that the laboratories contributed to the cooperation to develop the contents, as this cooperation was complete.
		Special Education	4	All supervisors answered that the contribution was significant

No.	Question	Major	No. of answers	Answers
3	The contents developed in the lab contributed to the improvement of teaching in pairs (teacher-student) during the experiment at "Hasbar" School	English Language	6	Three of the supervisors answered in the affirmative, two of the trainees said that it is not needed, and one of the trainees said that it strengthens the relationship and support between the teacher and the student.
		Arabic Language	6	Some supervisors believed that they would contribute and strengthen the student-teacher relationship, and the social and emotional skills they acquired, while others said that the contribution is their positive interaction with others.
		Maths	6	All supervisors answered yes
		Science	6	Four of the supervisors answered that the contribution exists, one of them said it is excellent, and another opinion was that the goal of product development is to develop teaching experience and improve work in training for both students and instructors. This ultimately positively affects the quality of teaching in pairs, provides learning opportunities in groups of students, creates opportunities for personal expression in teaching and creates a situation of multiple perspectives between teachers, supervisors and students.
		Childhood	4	All supervisors answered positively and indicated that the contents developed in the laboratory contributed to dealing with certain challenges during the days of the experiment.
		Special Education	4	The answer was that the contribution was present in certain segments of the content.
4	The study of practice is the process of observing actions that allow problem solving, learning and development during work processes. How is this reflected in the Spiral lab? Please explain	English Language	6	One of the answers was: The search for practice through practical research is highly advantageous for students and supervisors as well as academic leaders to identify and discuss problems and provide solutions to those problems, and another answer: during the vortex there is a study of the society through which thinking, analysis, discussion, problem solving and making claims and solutions are carried out. The rest of the answers were only "yes".
		Arabic Language	6	One of the answers was: discussing problems and proposing solutions, and another answer: you can choose a product from the laboratory to check its proficiency in the field.

No.	Question	Major	No. of answers	Answers
		Maths	6	Two supervisors replied that it did contribute, two answered that it contributed to a certain extent, and two answered that it developed and investigated problems.
		Science	6	The supervisors' responses were as follows: Open discussions of the issues on the table allow for a systematic discourse that confers a diversity of ideas, solutions and products. There was an opportunity in the lab to bring challenges and issues from the field and practice to observe work and receive a variety of opinions from experienced people, and ongoing discussions and meetings of various fields.
		Childhood	4	One of the answers was as follows: it was peer learning; the entire group collaborated in writing the results of the work in the lab and the results were also presented by the group representative to other colleagues in the other group
		Special Education	4	A program was introduced to identify an intervention to improve the personal skills of the student and the teacher trainer
5	Has there been a contribution of the Spiral lab to the development of your reflective educational discourse? How?	English Language	6	All trainees answered "yes"
		Arabic Language	6	All trainees answered "yes"
		Maths	6	All trainees answered "yes"
		Science	6	Five of the trainees answered "yes", and one said the contribution was partial.
		Childhood	4	All trainees answered "yes"
		Special Education	4	All trainees answered "yes"
6	Describe the purpose of the product you developed in the lab and how it is presented in response to an educational leader/ teacher	English Language	6	One answer was: working in groups and learning through social activity, and another: critical thinking and problem solving. One of the supervisors replied that it is to present ideas, problems and solutions in an organised and coherent manner
		Arabic Language	6	One of the supervisors explained that it is to improve the relationship between the teacher, the supervisors and the student to strengthen the partnership between them. Another replied that it helps in applying different skills in teaching and assessment processes
		Maths	6	Most have pointed out that it works to bridge theory and practice

No.	Question	Major	No. of answers	Answers
		Science	6	One supervisor replied that it encouraged everyone, and contributed to improving the role of each party in the practical experience, and another added that the development of a product of skills and content related to social-emotional learning is an important component of professional development among members of teacher training communities, so that they serve as a model and influence other through their behaviour. Social-emotional learning among students in schools contributes to practical research and practice. Another replied that it increases the opportunity for project-based learning with an emphasis on the image of the internal motivation to learn, since students have a great deal of autonomy in the learning processes and product preparation.
		Childhood	4	One of the supervisors replied that it works to improve the quality of the thinking process in the field, and another answered that the purpose of the product is to increase self-awareness and provide critical thinking skills
		Special Education	4	The supervisors replied that it improves teaching skills and improves learning
7	Is the Spiral lab a place for continuing professional development?	English Language	6	All trainees confirmed this
		Arabic Language	6	Four of the trainees said they thought so, and two said to "some extent"
		Maths	6	Two said yes, two confirmed it, and two denied it
		Science	6	All trainees confirmed that
		Childhood	4	Two of the trainees answered yes, and two were hesitant to provide a direct answer
		Special Education	4	All trainees denied that

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