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Instructional Coaching Through Technology Integration: Accompanying Teacher Services in the Digital Era of Education 5.0

Anita Md Saman[1], Khalip Musa[2]

[1,2] Faculty of Management and Economics Sultan Idris Education University 35900 Tanjong Malim, Perak, Malaysia

ABSTRACT

In the era of Society 5.0, skills in the field of digitalization must be mastered by educators. This is because teaching and learning (TnL) in schools is no longer limited to pedagogy but also heutagogy, peeragogy, and cybergogy. In this regard, as an instructional coach, SISC+ not only emphasizes guiding teachers in their professional development (PD) in lecture rooms but also instills changes in pedagogical skills for better TnL. As an instructional coach, SISC+ must emphasize the practice of guidance based on digital technology in accordance with today's education following the landscape of the Society 5.0 education era. This review study was performed by searching articles on "instructional coaching" and "digital technology" from databases such as ERIC, ProQuest, Emerald, and Google Scholar. The analysis conducted has identified four instructional coaching models used in the freelance studies: a) Instructional Coaching Cycle Model, b) Models of Literacy Coaching, c) Technology Integration PD Coaching Models, and d) Instructional Coaching Model based on digital education. The findings lead investigators to further analyze the four models to increase the effectiveness of instructional coaching in integrating digital technology in TnL.

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KEYWORDS:

Instructional Coaching, Professional Development, Digital Technology

INTRODUCTION

Recently, many countries have been promoting digital technology in schools for educational purposes at the country and global levels (Maritsa et al., 2021). The Ministry of Education (MOE) Malaysia has developed the Information and Communications Technology (ICT) Transformation Plan 2019–2023, which was launched to support the digital education agenda in Malaysia (KPM, 2015). Teachers are encouraged to master digital technology skills to elude difficulties in manifesting educational changes (Hamzah et al., 2021). Therefore, to achieve the objectives of the 2019–2023 ICT Transformation Plan, teachers need to apply pedagogical approaches based on digital technology to improve academic achievement and increase student marketability (Shulla et al., 2021) in the era of Education 5.0 (Md Soh et al., 2021).

Corresponding Author: Khalip Musa

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According to Ottenbreit-Leftwich et al. (2020), one of the important aspects of promoting digital education is through professional development (PD), which has a positive impression on teachers' technology integration practices. Hence, the MOE has developed the Malaysian Education Blueprint 2013–2025 to maintain teacher quality through the Fourth Shift, i.e., transform teaching into the profession of choice. To achieve this desire, the MOE emphasizes PD to enhance teachers' competence and performance to face educational transformation. Therefore, PD needs to be implemented strictly, focused, and comprehensively (KPM, 2013).

PD for teachers will be more effective with the help and support of mentors, inclined for continuous changes in practice compared to traditional approaches, which involve workshops and lectures (Connor, 2017). Teachers who work with mentors use technology more frequently and efficiently than those without mentors (Bakhshaei et al., 2018). Mitchell (2019) also confirms that emerging innovative teaching practices are more common among teachers with digital technology-based pedagogical mentors than those without. This is because instructional coaches (ICs) as mentors can increase teachers' confidence, motivation, and positive attitude (Warnock, 2022). Therefore, PD must be based on

sharing instead of ICs dispensing supervisory functions and teachers as learners (Caneva et al., 2023).

The Malaysian Education Blueprint 2013–2025 has also outlined that teachers will receive more support to help exploit their potential in teaching (KPM, 2013). Teachers receive support to improve PD practice from an ICs known as the School Improvement Specialist Coaches (SISC+). SISC+ encourages teachers to introduce a 21st-century educational conceptual approach, including digital technology skills (Sarabiah, 2018), which supports their ability to integrate technology in teaching across curricula (Grierson et al., 2022). Moreover, the SISC+ program in Malaysia has been used as a model to improve education quality in China (Yan et al., 2022).

Since studies on the integration of technology in ICs aimed at promoting teachers' technology practice are limited (Caneva et al., 2023; Ottenbreit-Leftwich et al., 2020), the necessary conditions for effective instructional coaching need to be examined to better inform interested parties and training institutions.

Therefore, the issues of study, specifically for future investigations, are as follows:

S1: What difficulties do ICs experience when supporting teachers in digital education?

S2. Which PD activities do ICs provide teachers?

METHODOLOGY

This review is based on the collection and analysis of previous models. Keywords like "instructional coaching" and "digital technology" were used to find relevant articles from electronic databases, such as ERIC, ProQuest, Emerald, and Google Scholar. The studies were analyzed based on the conceptual approach and the models used. A suitable model of research on instructional coaching through technology integration can be explored to carry out future research.

LITERATURE REVIEW

Instructional Coaching (IC)

Instructional coaching is a strategy to improve curriculum implementation of teachers' strategies, techniques, and abilities in teaching and learning (TnL) (Knight & Carlson, 2015). This guidance approach is a process that involves two or more professional partners who work together to reflect current practices, develop, refine, build new skills, share ideas, and jointly solve problems in the workplace (Franey, 2015). In the context of TnL teachers in schools, IC is a situation that allows teachers to share teaching experiences and pedagogical knowledge in classrooms without any coercion that is oriented toward improving student learning (Tella, 2017).

SISC+ as an Instructional Coach (ICs)

In Malaysia, instructional coaching acts as a model to improve student achievement by redesigning the way teachers teach. MOE introduces SISC+ as an ICs to guide selected teachers in pedagogy, assessment, and curriculum to create a more interesting and effective TnL in classrooms in line with current developments.

According to Kadir et al. (2021), the role of SISC+ and tutoring among teachers showed that the level of instructional coaching is high, indicating that teachers are willing to seek coaching from SISC+ to acquire metacognitive skills and improve TnL efficiency. Teachers are more confident in dealing with student issues, and the classroom management approach in the lesson study has helped improve the skills and competence of teachers (Amirullah, 2018). SISC+ has the potential to recognize the ability to train teachers in schools and implement quality TnL (Balang, 2020; Khun et al., 2019; Madhavan et al., 2020).

Teachers are the foundation of world-class human capital growth because they can improve student skills and continue to improve PD through the SISC+ initiative with instructional coaching (Poobalan et al., 2021). Ideally, SISC+ plays an important role in helping and building quality teachers consistent with global education growth that is very demanding from a technical perspective, besides creating a more developed world society. However, studies in Malaysia on ICs are scarce and do not specifically mention the integration of technology aimed at encouraging teachers' digital technology practices.

Digital Technology

Technology comes from the Greek word *techne*, which means art or skill used to solve problems, improve existing solutions to a problem, achieve goals, control input or output relationships that are applied, or carry out certain functions. Technology is the force that acts as a driving force to guide or run our lives. It has brought the automation stage to a high level, saving human time and effort in all aspects, especially education.

Digital technology includes all types of electronic devices, gadgets, and applications that use information in digital form, including laptops, smartphones, and other high-tech devices (Michael & Ambotang, 2020). According to Hoyles and Lagrange (2010), digital technology has dominated the education system in today's world. This is due to the effectiveness, proficiency, and attractiveness aspects offered by learning based on digital technology. Therefore, digital exposure and application of technology, which start from primary and secondary levels, are hoped to increase the marketability of competitive students at the higher education level (Shulla et al., 2021) in the era of Society 5.0 (Md Soh et al., 2021).

Education 5.0

Society 5.0, introduced by Japan in 2017, brought major changes to the educational landscape, especially for education in Malaysia. Society 5.0 aims to create a society capable of

dealing with social challenges by implementing technology and innovations from the Fourth Industrial Revolution (IR 4.0) into every industry and social life (Aziz & Sieng, 2019). In accordance with the country's education system, which has changed with time and technological advances, Malaysia is no exception in introducing Education 5.0 for the education system to promote quality education (Md Soh et al., 2021).

Instructional Coaching as a form of PD for teachers

PD is an effort to allow teachers to continue learning to improve their and the schools' and students' achievement. PD is not only implemented on new teachers but also on those who are serving regularly and systematically. It will ensure that they are updated with the latest knowledge, in line with current changes, including the content of the subjects and the TnL approach (Shuib et al., 2020).

The process of improving teaching begins with a PD session, followed by the transformation of knowledge and skills and ends by producing effective teaching practices. The process will contribute towards improving learning outcomes and improving schools. One of the most important factors in determining the effect of coaching practice in improving teaching is the amount of time allocated by IC in providing support and assistance to teachers in the classroom (Sarabiah, 2018).

Meanwhile, ICs needs to know coaching practices (Sarabiah, 2018). This is because the coaching practice can encourage teachers to try new ideas to improve teaching, particularly if they receive support from an ICs after attending a PD session (Neufeld & Roper, 2003). With support from ICs, a knowledge transformation process takes place, which allows teachers to improve their teaching. Moreover, the influence of instructional coaching practices on PD in helping teachers improve teaching practices will also be looked upon (Stoetzel & Taylor-Marshall, 2022).

According to Kraft et al. (2018), more than 60 experimental studies conducted in the United States on the effects of instructional coaching yielded a positive and significant overall effect of coaching on teaching practice and student achievement. Additionally, according to Holden (2021), over the past decade, instructional coaching has played an important role in PD models across school systems because it has been linked to increased student achievement in implementing curriculum initiatives. However, the findings are contradictory to those in Latin America, where learning outcomes are low despite the prevalence of instructional coaching in teacher PD interventions (Furman, 2021).

The Pennsylvania Institute for Instructional Coaching (PIIC) revealed that teachers agreed on the guidance that stimulated their interest was in the form of PD run by an ICs (Charner & Medrich, 2017). Consequently, the investigation by Mobarak et al. (2019) on teachers' coaching programs chaired by SISC+ in Malaysia suggested steps to increase TnL, mostly implemented through in-situ PD.

Model

Four IC models may be used in the context of study issues, although only a few are specifically tailored for integrating digital technology.

IC Cycle Model

The Impact Cycle Model (Figure 1) introduced by Knight (2018) is an IC cycle model comprising three phases: the first phase (identify), the second phase (learn), and the third phase (improve).

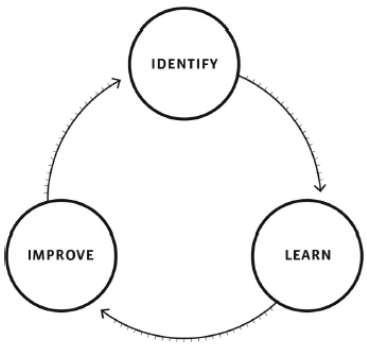

Figure 1: Impact Cycle Model by Knight (2018)

During the identification phase, the IC works with the teacher to identify a clear picture of the reality, objectives of the powerful, easy, emotionally compelling, and reachable and student-focused (PEERS) approach, and strategies teachers will implement to achieve the objectives. During the learning phase, the IC helps prepare the teacher to achieve the objectives by explaining the strategies to be implemented. Finally, during the improvement phase, the ICs supports the teacher as they make adjustments to achieve the objectives.

Phase One: Identify

According to Knight (2018), three things need to be addressed in the identification phase, i.e., current reality, objectives, and teaching strategies. For the first encounter session, the ICs

needs to chat with the teacher to acquire a clear picture of the current reality, identify the objectives, choose a TnL strategy to meet the objectives, monitor progress, and solve problems so that the objectives are met. ICs discussions with teachers are conducted to achieve the objectives based on the concept of PEERS suggested by Knight (2018). The teacher considers all the shared results of the conversation and produces the best practice in the classroom according to their professional discretion.

Phase Two: Learn

This phase is focused on teaching strategies. An ICs can enhance and facilitate a teacher's explanation through checklists, which facilitate the latter to carry out teaching strategies. Teachers are also encouraged to make additional changes according to suitability. In addition, an ICs may act as a model by teaching parts of the lesson in class while being observed by the teacher. This way, the teachers may gain deeper insight while referring to the checklist. The ICs may provide TnL activities and co-teach with the teacher. The ICs may also demonstrate strategies for teaching without students in class.

Phase Three: Improve

Initially, implementing the strategy will not immediately lead to achieving the objectives. Thus, the ICs plays a vital role in encouraging and supporting the teacher when they become discouraged by the outcomes. Thus, the ICs should begin by confirming that both parties are concerned about the same issues and discuss adapting teaching strategies during the conversation in the improvement phase. The ICs and teachers may start a new cycle if necessary.

The ICs and teachers use the Partnership Principles by Knight (2018), located in the midst of the Impact Cycle Model (Figure 2). The seven Partnership Principles for coaching are equality, choice, voice, reflection, dialogue, praxis, and reciprocity (Knight, 2018)

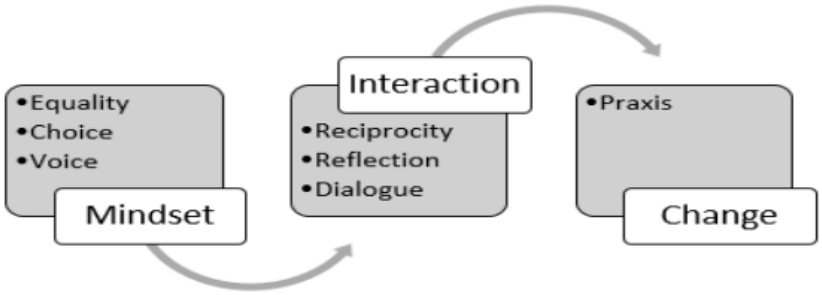

Figure 2: Partnership Principles by Knight (2018)

Equality. Teachers and ICs work together in the instructional coaching process as partners by learning and creating relationships to help teachers improve TnL.

Choice. When working with teachers, an ICs needs to give teachers a choice in what they want to focus on during the instructional coaching process, leaving the final decision to the teachers.

Voice. During the learning process, teachers want to believe that their goals are significant to student learning, and working with ICs will help them increase their level of constructive change by allowing all parties to voice their ideas and concerns.

Dialogue. Dialogue with teachers must occur for them to feel comfortable and not pressured to talk about their teaching ability (Knight, 2016). The need for clear communication between the teacher and ICs ensures that the former feels their ideas and thoughts are listened to and considered important in increasing the quality of TnL (Daniels, 2020).

Reflection. Reflection is the process of thinking through what teachers are doing to improve their TnL and considering what is going well and what needs changes to improve it. When teachers are free to guide their learning through reflection, actual learning occurs.

Praxis. Praxis is when the teacher applies the new knowledge and skills learned in working with an IC during TnL. The skill of praxis is also engaged when teachers think through their new learning and decide what will or will not work for their students.

Reciprocity. Reciprocity is when ideas are shared equally, and everyone has the opportunity to learn. When reciprocity is involved, everyone is a teacher and a learner regardless of their position in the process. Hence, ICs view themselves as learners as well as teachers.

IC uses the Principles of Partnership Knight (2018) to support the teacher's mind, interact, and make changes in practice. Shared thinking establishes a cooperative relationship between IC and teachers to foster improvement.

Models of Literacy Coaching ILA (2018)

The second model, which refers to the conceptual framework from the International Literacy Association (ILA), categorizes the coaching model into three categories: coaching to conform, coaching into practice, and coaching to transform (ILA, 2018), as listed in Table 1. Each category differentiates the process and results of changes implemented for the IC efforts. The coaching model in each category shows that individual coaching can influence teachers' changes implicitly or explicitly (Stoetzel & Taylor-Marshall, 2022). This element explains the flexibility of teachers' participation in PD activities, which is a pointer to the success of the IC. However, this model is not as specific for digital technology integration as the Ottenbreit-Leftwich et al. model (2020)

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Table 1. Models of Literacy Coaching ILA adapted from Stoetzel & Taylor-Marshall (2022)

Categories	Goals	**Features**
Coaching to Conform	Supports classroom implementation of (and often fidelity to) instructional reform and/or curriculum initiatives	Clear boundaries separate IC and teacher IC is expert with supervisory functions. Teacher is learner Often positioned as a "top-down" approach to PD
Coaching into Practice	Fosters teacher reflection to develop instructional practice	IC and teacher collaborate as partners Emphasizes teacher sense-making Focus on student experience is central to inquiry
Coaching to Transform	Attempts to engage more critical reflection into practice to examine assumptions, ideologies, and power as they are taken up and institutionalized within programs, practices, and beliefs	Focuses on humanizing coaching pedagogies and critical inquiry groups Fosters teachers' ability to recognize, inquire, and act upon critical reflection Requires support of school leadership to enact

Technology Integration PD Coaching Models adapted from Ottenbreit-Leftwich et al. (2020)

The third model is adapted from Ottenbreit-Leftwich et al. (2020). Figure 3 illustrates changes in teachers' practices involving technology integration. The model combines the characteristics of effective PD and focuses on the importance of building relationships and personalization to best address the needs and goals of teachers.

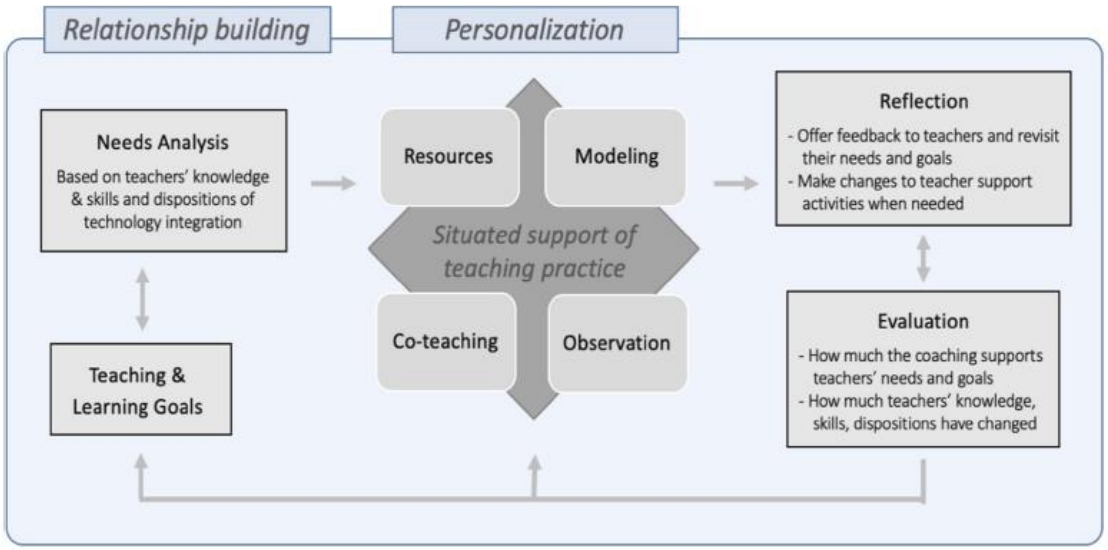

Figure 3: Technology Integration PD Coaching Models adapted from Ottenbreit-Leftwich et al. (2020)

This coaching model is iterative, conducted over a year, and guides all IC activities, such as providing technical problem-solving, modeling, co-teaching, finding resources or carrying out observations, and providing feedback. This model contains the following features:

i. Relationship building

Fostering relationships apply before coaching to individual teachers is carried out. Once a teacher volunteers for coaching, the IC creates a specific PD catered to the teacher's interests and needs.

ii. Personalization

Another core value of the guidance model is the personalization or adjustment of tutoring activities to address the individual needs of teachers. Personalization was initially conducted by carrying out a needs analysis to ascertain the needs and objectives of the teacher. Teachers also self-report their knowledge, skills, and inclinations toward technology integration. Advisers will use this information to adapt the PD to the specific needs of each teacher in a technology context. IC provides practical, real PD experiences in teachers' teaching contexts using technological resources in their schools.

The technology integration coaching model is very effective in changing teachers' technology practices. It establishes a strong relationship between the teacher and the IC and identifies mechanisms for developing the IC's knowledge regarding specific grade contexts and pedagogical practices (Liao, 2021; Ottenbreit-Leftwich et al., 2020).

IC Model Based on Digital Education adapted from Caneva et al. (2023)

The fourth model is based on the conceptual framework of IC on digital education adopted from Caneva et al. (2023). The model (Figure 4) comprises three main components to guide and answer the questions of this study. The first component is the characteristics of the IC, the second is the organizational characteristics, and the third is the guidance and the characteristics of PD activities.

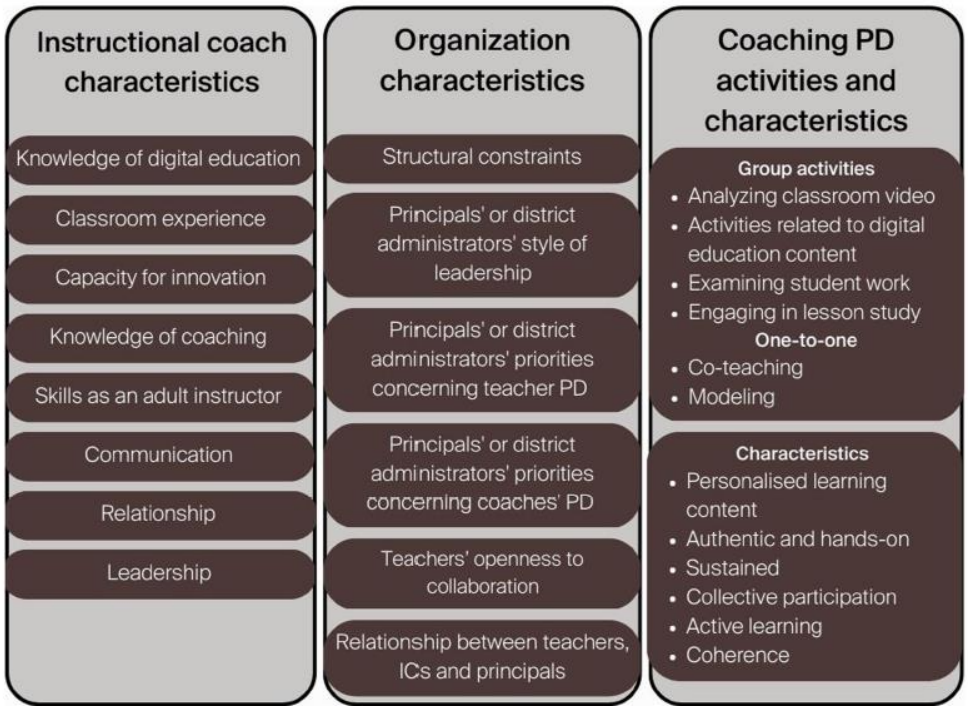

Figure 4: Instructional Coaching Model based on Digital Education adapted from Caneva et. al. (2023)

The three features of the model are as follows:

i. Characteristics of IC

Characteristics of an IC are necessary conditions for teaching technology to ensure the successful implementation of coaching interventions (Bakhshaei et al., 2019). Therefore, ICs must have certain professional qualities and characteristics besides confidence and the ability to utilize technology in education. The skills of an IC depend on their experience or training in the field as a coach. Therefore, ICs also need continuous PDs (Wilson, 2021), such as skills and knowledge in coaching, digital education, relationships, communication, leadership, and others (Caneva et al., 2023).

ii. Features of school organization

Organizational characteristic is the determining conditions necessary for effective teaching with technology coaching due to its impact on the organization, ICs, and teachers.

iii. Coaching and the characteristics of PD activities

PD can be grouped into coaching activities offered to teachers individually or in groups. According to Gibbons and Cobb (2017), state and district policies increasingly encourage ICs to work with groups of teachers. Therefore, both approaches should be considered complementary. PD activities should be based on the learning content (Ottenbreit-Leftwich et al., 2020), must be authentic and practical (Liao et al., 2021), and should include collective participation (Ottenbreit-Leftwich et al., 2020).

DISCUSSION

In Malaysia, teachers are very diligent in helping students during or after the TnL process. Teachers use various styles in teaching strategies. Thus, teaching strategies need to be strengthened to make TnL more attractive. This is because fresh pedagogical methods will help teachers manage classrooms better (Cocca et al., 2018). Continuous involvement of teachers in PD through IC can add value to their beliefs, especially involving digital technology (Hall & Trespalacios, 2019). This way, teachers will be more committed if they are held accountable for implementing digital technology-based TnL (Barton & Dexter, 2020).

The appropriate and chosen model is the Instructional Coaching Model based on Digital Education, adopted from Caneva et al. (2023). This model includes all the features needed to meet the needs of the teachers, the organization, and the ICs. The first two components of the model, i.e., the characteristics of IC and school organization, allow us to understand more about the implications of the problem of the first problem statement, S1: What are the difficulties experienced by ICs when supporting teachers in digital education? The third component, i.e., Coaching and the characteristics of PD activities, answers the second problem statement, S2: Which PD activities do ICs provide teachers?

The first model mentioned in this review is the Impact Cycle Model by Knight (2018). ICs work with teachers to get a clear picture of the current reality, identify objectives, select TnL strategies to meet objectives, monitor progress, and solve problems to achieve objectives (Knight, 2018). The second model is the Instructional Coaching Literacy Model adopted from ILA (2018), which only focuses on the practice in the study room and is not specific in integrating digital technology. However, the ILA model (2018) could directly or indirectly influence teachers' changes (Stoetzel & Taylor-Marshall, 2022).

The third model is the technology integration IC model by Ottenbreit-Leftwich et al. (2020). The model is very effective in changing teachers' adoption of technology. The model incorporates effective PD features to best address teacher needs and objectives. However, this model only characterizes the teacher's needs. It does not emphasize the need for an IC despite the gained attention of empowering IC in future studies. According to Balang et al. (2020), IC such as SISC+ are highly competent in pedagogical knowledge. This is the basis for success in teachers' guidance. The results of their study proved that SISC+ is competent and knowledgeable in pedagogical aspects. However, SISC+ competence is not specific to digital technology integration.

Nevertheless, the findings in this current study guide the use of a concurrent model to give a practical impression. The justification is that indicators in IC have been proven to have an aura to influence teachers to use digital technology (Bakhshaei et al., 2018).

CONCLUSION

The integration of digital technologies seeks to increase the effectiveness of TnL processes due to their interactive and engaging nature. As a form of new skills, teachers need to be assisted by experienced and proficient IC through continuous PD. Four model options that provide IC were chosen from previous studies: a) Instructional Coaching Cycle Model (Knight, 2018), b) Models of Literacy Coaching (ILA, 2018), c) Technology Integration PD Coaching Models (Ottenbreit-Leftwich et al., 2020), and d) Instructional Coaching Model based on Digital Education (Caneva et al., 2023). The selection of an appropriate and effective model depends on the level of proficiency of the IC and the supportive school environment.

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