Content Specific Pedagogical Knowledge and Teacher Knowledge Transfer

[1]Evelyn Njurai, [2]Josephine Oranga, [3]George Areba & [4]Billiah Gisore

[1]Department of Curriculum, Instruction & Media, Kisii University, Kenya

(evelynnjurai@kisiiuniversity.ac.ke)

[2]Department of Special Needs Education, Kisii University, Kenya

[3]Department of Educational Administration, Planning & Economics, Kisii University, Kenya

[4]Department of Educational Psychology, Kisii University, Kenya

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Abstract

Pedagogical knowledge and in particular Content Specific Pedagogical Knowledge (CSPK) has been widely researched and discussed. Teacher training institutions globally have embraced knowledge bases proposed by researchers in their curriculum to prepare teachers for teaching. The transferability of CSPK has, however, received little attention. This article explores the transferability of CSPK by teachers. Using a literature review analysis method, the article raises the questions of why, and how, the need for CSPK transfer and addresses issues surrounding knowledge transfer. Focusing on a spiral curriculum, the transfer is seen more in relation to conceptual connection within a subject and across subjects, and integration of disciplines. The authors argue that teacher training should embrace aspects of knowledge transfer so that teachers are not rendered redundant when curricular changes and when some subjects which teachers have been trained are dropped from the curricular. Further research is recommended.

Keywords: Pedagogy, Pedagogical Knowledge Transfer, Content Specific Pedagogical Knowledge, Tacit Knowledge, Explicit Knowledge

Introduction

Content Specific Pedagogical Knowledge (CSPK) was developed from Pedagogical Content Knowledge (PCK). In this construct, Shulman (1986) identified PCK as the blending of pedagogy and subject content knowledge such that a teacher has the capacity to transform the content knowledge in possession into forms that are pedagogically sound for students' learning. Shulman (1987) argued that a teacher needs to have seven knowledge bases in preparation for teaching: content knowledge, general pedagogical knowledge, curriculum knowledge, pedagogical content knowledge (PCK), and knowledge of learners, knowledge of educational context, and knowledge of educational purposes. In their work, latter researchers such as Adams and Krockover, (1997), modeled a framework for the desired teacher knowledge, which included pedagogical content knowledge, general pedagogical knowledge, subject matter (content) knowledge, and knowledge of the milieu and of self (the teacher). These latter work showed some similarity with Shulman's knowledge bases. In fact, the researchers observed that a teacher needs to acquire general pedagogical knowledge before the subject specific pedagogical knowledge and that content knowledge was a key prerequisite to attaining subject specific pedagogy in order to teach effectively and successfully. Consequently, a sufficiently developed curriculum for teacher education should embrace the knowledge bases contextualized for effective teacher preparation and development.

Teacher training programs globally have exposed pre-service and in-service teachers to the aforementioned knowledge bases. In China, it was suggested that teacher training should include critical insights into the contemporary social, cultural and pedagogical origin of students' dispositions to learning (Dooley, 2001). This was found necessary for teachers to re-invigorate social justice agenda in conditions of increasing cultural diversification and re-traditionalisation of education and by extension focusing on the learner in the planning and instruction processes. Teachers' employer in Kenya, the Ministry of Education, through its agent, Teachers Service Commission (TSC) details expected qualifications for aspiring teachers (Teachers Service Commission (TSC), 2018)). Therefore, teacher training institutions curriculum incorporate the knowledge bases in training the teachers informed by the expected qualifications. For example, the teacher education curriculum documents for instruction at Kisii University, provides pre-service teachers the opportunity to learn courses based on subjects of specialization, general pedagogy that applies to all subject areas, and content specific pedagogy in subject methods courses. The other bases such as curriculum knowledge, knowledge of learners, knowledge of educational context, and knowledge of educational purposes are incorporated in other courses which also include the national goals and objectives of education (School of Education and Human Resource Development (SEDHURED), 2015). While the PCK is taught per subject area, it is necessary to explore transferability of CPCK.

This paper presents preliminary findings of a larger research on the influence of CSPK on teacher preparation and retention. The paper is organized as follows; a background and purpose of the study, methodology, teacher preparation on pedagogy, theories informing knowledge transfer, teacher knowledge transfer, transfer of CSPK, conclusion and recommendations. While the paper presents a global perspective, examples are generally drawn from the teacher education programs of Kenya.

A Focus on Pedagogy

Pedagogy refers to how a teacher delivers content or a curriculum to learners; this involves approaches, methods, strategies, practices, and teaching styles. Drawing on Shulman's work of 1987, researchers have conceptualized pedagogy in three paradigms**:** General Pedagogical Knowledge (GPK), Content Specific Pedagogical Knowledge (CSPK), and Topic Specific Pedagogical Content Knowledge (TSPCK). GPK is the knowledge of how to plan and organize a classroom and manage students for and during instruction (Baxter & Lederman, 1999; Leijen, Malva, Pedaste, & Mikser, 2022). The instructor possesses ideas of pedagogical concepts and has general knowledge of instruction not oriented to any subject area. This could include evolution of teaching and learning methods, nature and components of teaching and learning processes, and main approaches to teaching. To acquire general pedagogical knowledge, there is a need for the teacher to have prior knowledge of the curriculum (what is proposed including structure, scope, sequence, connections and relations), students and their characteristics, and the teaching and learning environment. Further, general pedagogical knowledge is a necessary prerequisite for CSPK.

ContentSpecific Pedagogical Knowledge (CSPK) is the instructional knowledge of a particular subject matter, for example on teaching and learning methods of chemistry or biology (Veal & MaKinster, 1999). Prior to gaining CSPK and drawing from Shulman's (1986, 1987) knowledge bases, a pre-service teacher needs to have content knowledge of what is to be taught (Gillian & Youn-Kyeong, 2011), knowledge of the curriculum, and understandings of the nature of a discipline (Lerderman, 1999). Further, they need prior knowledge of learners and their characteristics, contextual influences on curricula implementation such as grades and textbooks, knowledge of educational contexts, and knowledge of educational goals, purposes, and values. The CSPK is necessary since each subject has its own concepts and terms (Veal & MaKinster, 1999) and in fact register as proposed by M.A.K. Halliday in 1978 Halliday, (Halliday, 1978). For example, concepts in mathematics include; sets, numbers, relations and functions, and variables. Further, some defining characteristics of mathematics register in relation to the English language include technical words and phrases that are unlikely to be encountered outside mathematics, for example equation and hypotenuse; characteristic modes of arguing; and some borrowed words such as moment, real, complete and natural, which have different meanings in the register from their original use (Schleppegrell, 2007).

In their work, Veal and MaKinster, (1999) further observed that CSPK can be more particulate to a topic of a subject rather than the subject as a whole. They observed that in topic specific PCK the teacher has a solid repertoire of knowledge and skills for instruction of a topic as compared to general pedagogy and CSPK. The authors argued that at a topic level, PCK enables teachers to create a bridge between the content of specific topics and students' understanding. In fact, in conceptual classroom discourse (Thompson & Thompson, 1994), not all topics in a subject can be instructed or learned in the same way possibly because of the conceptual differences. It is notable that disciplines are conceptually connected to each other. For example, the conceptual connection of chemistry and mathematics shows that a substantial part of chemistry uses and tests mathematical content (Njurai & Ratemo, 2023). Shing, Saat, and Loke, (2015) argued that the common concepts between two or more subjects are taught from different perspectives with different emphases in their respective domains. In fact, it could be that there are similar or different pedagogical approaches for the different concepts whether in the same subject or different subjects. The fact that a teacher can be more conversant with a concept in a topic than another teacher is undeniable. To facilitate

effective instruction, such teachers can practice collaborative teaching in the subject, where each teacher teaches the concepts and/or topics they are most conversant with in a local exchange program. In their work, Mavhunga and Rollnick (2013) defined this version as Topic-Specific Pedagogical Content Knowledge (TSPCK).

Figure 1 shows a conceptualization of pedagogy, classified from GPK to TSPCK (Veal & MaKinster, 1999). It is notable that CSPK is here referred to as Domain Specific Pedagogical Knowledge.

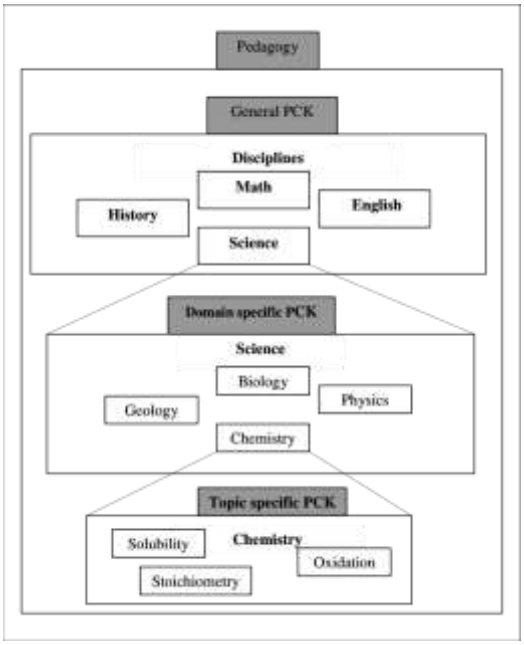

Figure 1: The taxonomy of PCK Veal and MaKinster (1999)

The taxonomy has three level where GPK applies in all disciplines, CSPK pertains to specific subjects or domains while TSPCK applies to topics or concepts within a subject or domain.

With the increasing integration of digital technology in instruction, Mishra and Koehler, (2006) introduced Technological Pedagogical and Content Knowledge (TPACK) building on Shulman's formulation of PCK. The authors argued that teachers require TPACK in order to attain thoughtful pedagogical uses of technology in teaching. GPK, CSPK and TPACK are the more common paradigms of pedagogy that teacher training institutions train pre-service teachers. It is necessary to note that, GPK, CSPK, TSPCK and TPACK can take the form of being transformative, learner-centered, innovative, inclusive, conceptual, and procedural or a combination of pedagogy. However, forms of pedagogies are beyond the scope of the current study.

In teacher training institutions, teachers are trained in specific disciplines to assist them in mastering the content and acquiring pedagogical knowledge and skills. The choice of the subjects at all levels is based on the pre-service teachers' grades in the subject(s) in their examinations prior to joining the teacher training, and the required subject combinations as determined by the job market. Consequently, these are the subjects they teach when in practice. One concern would be if the preparation in a specific subject aids a teacher

when there is a conceptual connection with another subject in which one is (not) trained and if such pedagogical knowledge is transferable. For example, in subjects that are closely related such as physics and chemistry or chemistry and biology. There are instances in which technical subjects were dropped from the curricula in Kenya. For the teachers in the subjects, did they transfer the pedagogical knowledge so that they can teach other subjects with or without prior training or were they rendered redundant? Kenya, through the Ministry of Education, is implementing Competence Based Curriculum (CBC) (Kenya Institute of Curriculum Development (KICD), 2019) currently at Junior Secondary School Grade 8. New subject areas such as integrated science in Senior Secondary Schools have been introduced in the curriculum. The integrated science involves integration of chemistry, biology and physics. Teacher training institutions have not been training teachers for integrated science since the adoption of the 8-4-4 system of education. The concern then becomes, if the pure science teachers take up the teaching of the integrated science, what is the expectation in terms of pedagogy? The purpose of this study is therefore to explore transferability of CSPK and/in relation to teacher pedagogical knowledge.

Methodology

To address the concerns raised, a desktop analysis of the relevant literature on CSPK transfer and teacher knowledge transfer was conducted. The study reviewed digital research databases of peer reviewed publications, peer reviewed journal articles, books and book chapters. This was to ensure rigor and scholarly significance. The key search terms used were "content specific pedagogical knowledge" "knowledge transfer", "pedagogical knowledge transfer" and "teacher pedagogical preparation", "tacit knowledge", and "explicit knowledge". The study cut across education levels of pre-service teachers with an inclination to university education in Kenya.

Teacher Preparation on Pedagogy

Training on pedagogy is anchored on theories of instruction and particular learning theories such as behaviourism and social constructivism (Pritchard, 2009; Vygotsky, 1986) as well as cognitive development theories (Bruner, 2006). In this light, preparation of pre-service teachers worldwide have similarities as well as differences. The similarities are evident in the courses offered in the training. Evagorou, Dillion, Viiri, and Albe, (2015) compared pre-service teacher preparation programs of England, France, Finland and Cyprus. Their findings indicated that the training included content knowledge in one or two subjects, and general and subject specific pedagogy. Some teacher training programs placed an emphasis on pedagogy and research. The researchers further noted that a balance between practice and theory was important during preparation, and that continuous professional development was not compulsory across the countries. In Finland, for example, teacher education is research-based; teachers are encouraged to adopt a research-orientated approach toward their work, to be analytical and open-minded, to draw conclusions based on observations and experiences and to develop teaching skills and methods in a systematic way (Evagorou, Dillion, Viiri, & Albe, 2015). It is no wonder that, in Europe, it is advocated that there should be policy prioritization to ensure recruitment, retention and continuous professional training of teachers (Osborne & Dillion, 2008).

In Nigeria, pre-service teachers are exposed to theoretical concepts in subject methodology, educational psychology,educational sociology and classroom management. In addition, they were taught various philosophies dealing with educational practices before proceeding for teaching practice (Okanlawon, 2014). In South Africa, the bases of pre-service teacher knowledge include content knowledge, GPK, CSPK, TPACK and other content that supports instruction and empowerment of the teacher (Chigona, 2015). Teacher professional development programs are in place amid challenges and ways of improving them (Dlamini & Mbatha, 2018; Bertran, 2011) .

In Kenya and in particular teacher training universities, a secondary school teacher is trained on a four-year program. In particular in Kisii University, a public university, about 50% of the courses taken are content courses, 9.4% are university core courses, 40.6% being education professional courses (School of Education and Human Resource Development (SEDHURED), 2015). Out of the education professional courses, two courses are on TPACK while one course is on general pedagogy, two courses on CSPK, ten on educational psychology, five on educational administration and planning, two on curriculum, and six on educational foundations. In the course of the training, the pre-service teachers are exposed to teaching practice for three months. Teachers in Kenya, therefore, cover general pedagogy, content knowledge, TPACK and CSPK. The teacher professional development programs that guide on teacher career progression are currently in place (Teachers Service Commission (TSC), 2018). The guidelines provide the minimum entry requirements into the teaching profession and the core competencies required for teaching and administration. The guidelines aim at addressing competency gaps identified from the performance of teachers, improving staff motivation and retention. However, anecdotal evidence shows that the uptake on the same is minimal.

From the foregoing, it is clear that there are similarities in teacher training on pedagogy globally. It is notable that the professional development programs improve teachers' preparations in content knowledge, pedagogical skills and ultimately students' performance and in fact on emerging and contemporary issues.

Theories Informing Pedagogical Knowledge Transfer

Theories of instruction and learning are necessary in pedagogical knowledge transfer. Connectivism theory of learning for digital learning advocated by Siemens, (2005) is one of the most prominent of the network learning theories that have been developed for e-learning environments. This theory has a bearing on knowledge transfer through making connections between and among areas of knowledge. Transformation theory focusing on adult education is also necessary in pedagogical knowledge transfer (Mezirow, 1994). Adults reflect on the past to modify or change meaning structures which inform the future. In the context of this study, teachers reflect on their pedagogical practices to inform how they instruct in the now and future. Cognitive development theories gave rise to the spiral curriculum, a representation of cognitive structures based on the notion of hierarchy in which early learning provides a foundation for later learning (Bruner, 2006). Hence the need for reflection on past pedagogical knowledge to inform the concepts learned in the future. Spiral curriculum is common globally and is in use in Kenya's education system.

Teacher Knowledge Transfer

Knowledge exists in the human mind through learning or experience and then gradually grows with experience, beliefs and attitudes, judgments, and value perceptions and thoughts. The growth of knowledge is informed by social and cultural activities among others. Scholars have identified types of knowledge based on different dimensions, for example Micheal. Polanyi identified tacit and explicit knowledge (Polanyi, 1962). Pedagogical knowledge is acquired, which grows and is nurtured through both pre-service and in-service training, experience, learner characteristics, environment, beliefs, culture, and other social interactions in general.

Knowledge transfer is about identifying knowledge that already exists, acquiring it and subsequently applying it to develop new ideas or enhance the existing ideas to improve process (Christensen, 2003) .It is the conveyance of knowledge from one place, person or ownership to another (Liyanage, Elhag, Ballal, & Li, 2009). In the light of this definitions, application, the third level of Bloom's Taxonomy, being the ability of a learner to use acquired knowledge in context of the subject matter, new and unfamiliar situations, and in real life situations, is part of knowledge transfer. Implying that for one to transfer knowledge, they must know and comprehend it. There are different kinds of knowledge transfers that researchers have identified, see for example (Simons, 1999) and models of knowledge transfer (Liyanage, Elhag, Ballal, & Li, 2009). Knowledge transfer is a complex process with numerous facets. In the context of the current study, the transfer of knowledge in reference is by an individual teacher, and his/her ability to transfer CSPK from one context to another, within a concept in the same subject or a concept(s) in the different subjects.

Tacit knowledge is ''non-verbalised, intuitive and unarticulated knowledge'' (Polanyi, 1962). It is highly personal based on own experience, reflections, cognition, or talents, which are difficult to be presented, captured, formalized or even coded outside of the individual and therefore difficult to communicate to others. Tacit knowledge is seen to add more value to an organization that an individual works than explicit knowledge. Explicit knowledge is objective and rational, and it can be encoded and stored in various physical and electronic formats (Polanyi, 1962). It can be articulated in formal language and easily be transmitted amongst individuals and recorded in documents or on computer systems. Polanyi observed that only a small part of our knowledge is explicit; because we can know more than we can tell. A teacher possesses both tacit and explicit knowledge and that CSPK is explicit knowledge.

Tacit knowledge can be transformed to be explicit knowledge (Nonaka, 1994). The transformation is part of the process of transfer of knowledge. Some scholars have suggested four steps of the process of transfer of tacit knowledge to explicit knowledge and in fact transfer of bits of explicit knowledge to new explicit knowledge (Peng, Feng, Zhao, & Chong, 2021). These are; (1) socialization: the beginning of knowledge transfer with the process of tacit knowledge, the facilitation of life experiences, (2) externalization: this propitiates all activities that are grouped and aimed to facilitate the knowledge management by changing the knowledge from being tacit to being explicit (3) combination: there is a process in which different pieces of existing explicit knowledge are merged to create new explicit knowledge; (4) internalization: a process is carried out wherein the student puts into practice what has been learned from their explicit knowledge (Peng, Feng, Zhao, & Chong, 2021). Thus the process of tacit knowledge being transferred to explicit knowledge can be conceptually distinguished along a continuum (Nonaka, 1994). CSPK is explicit

knowledge. At a possible point of transfer, teachers can objectively transfer explicit CSPK for and during instruction. A concern for this study is how fluid and dynamic CSPK is to be transferred to other subjects.

The behaviorist view conceptualizes learning and transfer in terms of observable and measurable relationship between the environmental triggers or stimuli and responses to those triggers. According to this view, transfer occurs when the behaviors learned in one context are utilized in a highly similar context (Pritchard, 2009). Fauth and González-Martínez (2021) defined learning transfer in context of teachers online learning as the degree to which a teacher learns in an online teacher training program and how the same teacher can effectively and continuously apply what they learned in a work context. OECD Education 2030 provided an orientation design principles for changes in curricula and education systems that will be relevant in different countries over time. One of them was transferability in which OECD suggested that higher priority should be given to knowledge, skills, attitudes and values that can be learned in one context and transferred to others (Organization for Economic Cooperation and Development (OECD), 2018)). From the foregoing, and in the light of integration of subjects using approaches such as multidisciplinary, interdisciplinary and trans-disciplinary or a combination of them (Drake, 1998; Lederman & Neiss, 1997), certainly transfer of CSPK becomes a possibility.

Content Specific Pedagogical Knowledge Transfer

To facilitate transfer of CSPK, teachers need to be adequately equipped with the knowledge bases such as those advocated by scholars (Adams & Krockover, 1997; Shulman L. S., 1987), identify with the type of curriculum to be implemented, spiral or otherwise, knowledge of educational purposes, the local, national and even global goals of education including SDG4, and the nature of knowledge to be transferred. They also need be conversant with modes of delivery, online, face to face or blended and which methods are suitable for various contents.

A necessary question is why the need for CSPK transfer. Transfer of knowledge is critical in an increasingly competitive knowledge-based global economy. In some contexts, when subjects are dropped from an ongoing curriculum, some teachers may be rendered redundant. To avoid this, they make attempts to remain relevant in the teaching profession by transferring the pedagogical knowledge from one subject to another. In 2022, UNESCO (United Nations Educational, Scientific and Cultural Organization) shed light on teacher shortages across the globe, highlighting an estimated 24.4 million teachers needed in primary education grades and 44.4 million teachers needed at the secondary education level in order to achieve universal basic education by 2030. In the United States, teacher enrollment rates are continually declining coupled with teachers leaving the profession (Mason-Williams, Rosenberg, Kimmel, & Sindela, 2020). This is amplified in urban settings than in the suburbanareas, and teachers of color leaving at higher rates than their white colleagues (Kohli, 2018). Interestingly in Africa and Kenya in particular, the number of teachers enrolled by the TSC has been on the rise. In the past, there has been teacher shortages and mainly so in certain subjects especially STEM subjects. To address teacher shortages, in New York State, a framework was designed to attract highly competent graduates who possess a bachelor's degree to the teaching profession (Boyd, Grossman, Lankford, Loeb, & Wyckoff, 2006). The graduates initially lack professional courses to be teachers and are therefore trained on the profession based on a major in the subject they plan to teach.

In Kenya, the Ministry of Education through TSC developed an alternative for graduates trained on at least two subjects in high school curriculum and who would like to train to join the profession. These join the teaching profession to train under Post Graduate Diploma in Education (PGDE) program offered in colleges and universities that train teachers. The prerequisite qualifications for them to train as teachers is that they should have done at least eight units for each of their intended two teaching subjects (Teachers Service Commission (TSC), 2018). The teachers are required to undertake professional courses in education, and methods of teaching their specific subjects. Other ways of engaging more teachers has been employment through and by the Boards of Management of schools. These are teachers fully trained but have not been employed by the government due to budget restrictions.

CSPK transfer is necessary for teachers in this globalized and innovative world. There is a need to apply and connect knowledge within a concept or between and among concepts and subjects. In single disciplines, especially where spiral curriculum is implemented, integration within a single discipline calls for CSPK transfer. For example, in mathematics where basics of measurements are taught in lower grades and the advanced knowledge taught in later grades, there is a need for transfer of the mathematics CSPK to reinforce content taught in the higher levels of learning. Further, subject integration may require CSPK used in teaching concepts be transferred to another subject. For example, a question testing concept of moles may require a learner to be well grounded on numbers, ratios and proportions and basic statistics (Njurai & Ratemo, 2023). In their analysis, the authors noted that many candidates were not able to determine the mole ratio and hence unable to use it in the subsequent parts of the question. This was due to lack of connection of mathematical concepts with concepts in chemistry. From a pedagogical point of view, it was probably lack of pedagogical transfer by the teachers and hence the impact on the learner's non-connection of concepts. In fact, anecdotal evidence shows that teachers rarely refer to the grounding concepts and hence students have to contend with the tasks. It is necessary teachers draw on and transfer pedagogical knowledge of the basic concepts to engage learners on application of the same in a different subject(s).

Practicing high school teachers in Kenya are commonly employed by universities either as part-time or permanent lecturers. They are employed on the bases of that they have pedagogical knowledge and skills from secondary teacher training. It is assumed they can transfer the CSPK from secondary level to teach courses in their subjects at university (Wambui, Ngari, & Waititu, 2016). This assumption is wanting since the teachers are trained for specific age groups and contexts. The CSPK and skills required at basic levels of education are not similar to those in HE, they can only complement the skills required since the teachers have a background of the students learning at lower levels. Furthermore, there are no institutions that train pre-service university faculty on pedagogy. University faculty who have not been trained on pedagogy at any level commonly engage with in-service training as they teach at university.

In response to the Coronavirus pandemic (COVID-19), learning institutions had to rapidly shift from in-person to remote teaching. Teachers had to change from face-to-face to online and remote teaching (Lambie & Law, 2020). There was ultimately a need to transfer face-to-face CSPK to online CSPK. In Kenya, the TPACK courses taken in undergraduate studies, were at the time not sufficient for the lecturers to use to teach online. They had to be trained right from primary schools to HEI. There were attempts to transfer the explicit knowledge by recording and storing it for presentation via various media such as radio, television and digital disks. In fact, presentation of recorded and live lessons on institutions learning management systems was key (Ngwacho, 2021) . While most of the basic levels reverted to face-to face modes after the

pandemic, majority HEI have to date continued to embrace the online pedagogical skills blended with the face-to face pedagogical skills.

Research shows some best practices in pedagogical knowledge transfer. Lakkala and Ilomäki (2015) observed that in-service teachers in same schools collaborated to provide support for in-service teachers willing to improve their competence in technology-enhanced learning. In attempts to find new methods for in-service teachers' ICT training, a European-level project, Fostering ICT Usages in Pedagogical Practices (FICTUP), was created to develop a practice transfer model where experienced teachers supported their less-experienced colleagues in implementing digital technologies in their teaching through authentic examples and guidance (Lakkala & Ilomäki, 2015). The main aim was to disseminate pedagogical practices, which were based on experienced teachers' well-tried and cultivated practices, represent ambitious pedagogical approaches, and are closely linked to the pedagogical objectives of the particular schools. The practice transfer model was tested in two case studies in Finnish elementary schools. The less experienced teachers noted that the most valuable feature of the model was the flexibility and easy availability of the support by the more experienced teachers.

From the foregoing discussion, most of the transfer of CSPK is seen to be in the area of use of technology and in fact online instruction. Research on CSPK transfer involving conceptual connection between and among subjects is not in place. Further, research indicates major issues relating to transfer of learning, including the complex nature of transfer, the multiple variables that need to be considered in pedagogical transfer, and the limited or non-existence of knowledge of instructional methodologies for facilitating transfer across disciplines and learning environments (Galoyan & Betts, 2021) which the teachers need to know and hence make progress in addressing the same. Teachers themselves need to be equipped to facilitate transfer of knowledge within and across concepts and subjects. In so doing, collaborations in teaching based on CSPK could be a reality. Since CSPK transfer is necessary for sustainable instruction in schools, there is need to explore kinds of motivation needed by teachers to transfer tacit knowledge to explicit knowledge, and explicit knowledge in one subject/concept to another. The article proposes that teacher training curricular should incorporate pedagogical knowledge transfer.

Conclusion

This paper has presented a theoretical discussion on CSPK transfer and teacher knowledge transfer. The discussion focused on three paradigms of pedagogy, teachers training on pedagogy, theories informing pedagogical knowledge transfer, teacher pedagogical knowledge and in particular CSPK transfer. Reasons on the need for CSPK transfer and modes of transfer have been presented. In fact CSPK provides opportunities for collaborative teaching. There are pertinent issues that need be addressed if teachers are to embrace CSPK transfer. It is notable that the courses on TPACK which teachers in Kenya undertake were not sufficient to transfer CSPK from face to face to online during COVID-19 pandemic.The discussion on CSPK transfer has implications on a number of issues in instruction such as teacher preparedness, teacher mobility and teacher retention within and without the teaching profession. With the introduction and implementation of CBC in Kenya, there is merging of subjects and split of others whose pedagogy need to be addressed.

Recommendation

This study has basically dealt with CSPK transfer with minimal mention of skills. Knowledge and skills go hand-in-hand, therefore, there is need to research on content specific pedagogical skills transfer. Further, there is a need more research on CSPK since it is the most common form of pedagogy in teacher training.

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