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A Systematic Review Of Constructivist Classrooms: Challenges For Teachers And Recommendations

Le Ha Van[a,b] , Nguyen Long Quoc[b]

[a]*van_20002056@utp.edu.my*
[b]*quocnl2@fe.edu.vn*
[a] *Universiti Teknologi PETRONAS (UTP), Malaysia*
[b] *FPT University, Ho Chi Minh, Vietnam*

ABSTRACT

Recent emphasis has been placed on shifting teaching away from lecture-centered mode, in which the emphasis is on what teachers are doing, toward a more student-centered constructivist approach, primarily focused on active learning and students' own knowledge constructions. However, implementing constructivist learning has been more challenging than many in the education field anticipated. Not merely acquiring new skills but also making personal sense of constructivism as a basis for instruction, reorienting classroom cultures to be consistent with the constructivist philosophy, and dealing with the pervasive educational conservatism that works against efforts to teach for understanding, are the most significant barrier to teachers. This paper gives a comprehensive theoretical analysis of constructivism in teaching and learning in order to provide a broad overview, highlight its fundamental aspects, outline typical challenges constructivist teachers frequently confront, and show the gaps in prior research. From such evaluations, meaningful information about constructivism can be gleaned, and practical education-related recommendations can be formulated.

Keywords: Constructivism, social constructivist classrooms, challenges, teachers' perspectives

1. Introduction

The past century did witness radical transformations in educational approaches to meet the ever-growing demand for high-quality education and training, from behaviorism (e.g., Skinner, 1953) to cognitive constructivism (e.g., Piaget, 1971) and social constructivism (e.g., Vygotsky, 1978). Teaching and learning practices have evolved from classes where students sit silently and listen to their teachers to those in which they actively work with one another and with their instructors to construct new knowledge. In other words, there has been a structural shift from the teacher-centered mode to the student-centered model. These conversions, with learners' involvement and interactions at the core, have contributed to the formation of an effective learning environment (Johnson & Johnson, 2012), spurring knowledge gains and intellectual development (Vygotsky, 1994). Promising as deemed, the comprehension and implementation of the constructivist approach have posed a wide array of challenges for multiple parties, such as educators, researchers, and learners, deterring them from obtaining fruitful outcomes. Several examples of endeavors to utilize constructivism in class, yet not successfully applied, can be found in several past articles (Huffman, Goldberg & Michlin, 2003; Bostock, 1998). Baviskar, Hartley, and Whitney (2003) evaluated that these studies "do not adhere to the constructivist criteria" (p. 541), making them not as effective as claimed. Parallels could be conceivably drawn from the analyses of

constructivist tenets in two online learning programs at two Australian universities in O'Connor's research (2020). The author concluded that constructivist features were not found in the pre-designed learning packages. The underlying message is that it is essential to examine what exactly hinders teachers from the appropriate application of the constructivist approach.

A typical and notable study that thoroughly analyzed the obstacles teachers usually encounter when applying constructivism is Windschitl's (2002). In his article, Windschitl categorized teachers' dilemmas as conceptual, pedagogical, cultural and political elements, providing a broad overview of constructivism history and in-depth details of the difficulties teachers face as well as suggestions for overcoming these issues. However, little information was discussed regarding the aspect of technologies in Windschitl's research (2002). In the twenty-first century, instructional technologies are one of the key factors that shape the landscape of teaching and learning practices (Johnson et al., 2016), especially in constructivist classes (Mustafa & Etma, 2013; Ramorola, 2013). A growing body of research has been conducted to explore the use of technologies in the classroom (e.g., Allen, 2008; Lewis, 2013; Stanley, 2013); nevertheless, few studies focus on the tensions that technological tools may cause in constructivist classes. Therefore, it is worth investigating whether technical problems can be added to Windschilt's categorization to make the picture more complete, encouraging schools together with policymakers to have proper and timely measures in case such issues exist.

In the context of Vietnam, constructivism has gained increasing attention and recognition from both educators and policymakers (Mai, 2008), and this learning theory has been fostered in a variety of schools, from primary to higher education. However, very few studies have been carried out to investigate this phenomenon in Vietnam, except for the research by Hằng, Meijer, Bulte, and Pilot (2015). In this article, the authors explored whether teachers were implementing constructivism in its essence. The results showed that the Vietnamese teachers still did not comprehend constructivism appropriately and that Asian culture strongly affected the teaching and learning practices in class. The authors did not look into what difficulties the teachers had with constructivism, and their focus was placed only on science in primary education. As for the situation of tertiary education, particularly in the field of ESL/EFL, whether teachers are fully aware of constructivism and whether they encounter any obstacles in their constructivist classes still remain unknown.

This paper aims to provide a broad overview of constructivism, emphasize its primary elements, summarize common issues constructivist teachers often face, and highlight the gaps in previous studies. From such analyses, insightful information regarding constructivism can be gained, and practical suggestions can be built, which benefit various parties in education. First, the paper contributes to the literature on constructivism, creating a bigger picture based on Windschitl's concepts (2002). Second, teachers have the opportunity to reflect on the problems they confront with constructivism and be advised on how to cope with them. Additionally, educators and policymakers, especially those in Vietnam, can have proper solutions to these problems in a timely manner, enhancing education quality and sustaining learners' development. Finally, it paves the way for future research on the core issues that require further exploration or clarification.

2. Definitions of constructivism in education

Due to its extensive application in numerous areas, constructivism may be viewed as a broad term that should be employed with caution.

However, this study highlighted the constructivist approach to education. Even within the narrower sphere of education; however, it is evident that the term constructivism is interpreted with vastly varied connotations. It is used to define learning, teaching, curricula, and evaluation (Sjøberg, 2010). As a result, many scholars argue that there has been a great deal of confusion over the concept of constructivism, despite the fact that a plethora of research has been discovered by Google search.

Multiple works of literature within the constructivism field support diverse conceptions of learning and instruction. Philosophers have proposed more than a dozen distinct "constructivisms"; nevertheless, the relevant material for educators can be logically grouped in terms of cognitive and social or cultural emphasis.

Cognitive constructivism is a concept of explanations for how learners adapt and enhance their knowledge as individuals (Piaget, 1971). According to this perspective, learners actively reorganize knowledge in highly individualized ways, basing flexible conceptual topologies on prior knowledge, formal instructional experiences, and a multitude of other stimuli that mediate understanding. Explicitly, the notion of cognitive constructivism implies a set of instructional commitments that differ from traditional subject-centered approaches. This perspective emphasizes the individual's mental activity and, when existing notions are questioned, presents other students as intellectual disruptors (Piaget, 1985).

Unlike cognitive constructivism, social constructivism perceives knowledge as a cultural artifact (Vygotsky & Cole, 1978). According to this theoretical perspective, which originated with Vygotsky's work, knowledge is shaped by micro- and macro-cultural influences and emerges through escalating participation in various communities of practice (Cole, 1990; Scribner, 1985). Vygotsky also created the concept of the "zone of proximal development," which holds that emerging mental functions must be promoted and measured through collaborative activities in which learners participate in heuristic tasks or problem-solving with the help of more experienced personnel. Through this assistance, the child internalizes the supporting language and tactics used on the social plane and learns the ability to execute similar tasks independently. One of the primary roles of education, according to the social constructivist perspective, is to create social contexts (zones of proximal development) for mastery and conscious awareness of the use of cultural tools such as language, representational technologies, and communication so that individuals can acquire the capacity for higher-order intellectual activities (Olson, 1986).

Social constructivism suggests that cultures or groups construct their knowledge bases via the discourse and interactions of their members, as opposed to the discoveries of individuals or the condemnation of authorities (Marin, Benarroch, & Jiménez Gómez, 2000; Rodriguez & Berryman, 2002). Collectively, oriented theories focus on how individuals make sense of the world, whereas social constructivist theories conceptualize learning as "diffuse, distributed, and collective", with individuals not understood as the locus of learning but rather as a "learning system within a learning system" (Davis & Sumara, 2010).

These theories pose problems regarding how knowledge is constructed today and whether it is possible to work directly from the problem rather than pre-defined underpinnings, as well as the focus that should be placed on the learner instead of the teacher. Within a constructivist framework, curricular content is not regarded as solely defined concerning students. Still, teachers are supposed to take students' preconceived views seriously, and there is a premise of adjusting for

variation among student cohorts. Nonetheless, there is a consistent, intense focus on ensuring that teachers are responsible for and engage with students' own preconceptions and understandings. Therefore, there is a need for flexibility in how the curriculum is preformulated and instructors engage with students (Davis & Sumara, 2010; Sjøberg, 2010).

Among the extensive spectrum of constructivist learning theorists, the following are some of the most fundamental notions, primarily based on the analysis of Taber (2006) and Sjberg (2010), which we regard to be a moderate and sensible interpretation of constructivist claims:

- Learners actively construct knowledge rather than passively receive it from the outside. Learning is something that learners do, not something that they are forced to do.

- Learners enter the learning environment with preexisting conceptions of several things. Some of these concepts are ad hoc and unstable, while others are well-grounded and matured.

- Learners have their own unique perspectives on the world, but there are also many parallels and commonalities among these perspectives. Some of these concepts are socially and culturally recognized and shared, and they are frequently a part of the language, backed by metaphors and other devices. They are also often valuable as instruments for comprehending a variety of occurrences.

- It is feasible to model and explain conceptual structures that represent knowledge in the brain in great detail.

- If teaching desires to alter or confront the learner's existing notions, it must take these into account.

- Although knowledge is personal and individual in one sense, learners expand their understanding through engagement with the physical world, collaboration in social contexts, and exposure to a cultural and linguistic milieu.

3. Essential criteria for constructivism

According to Airasian and Walsh (1997) and Richardson (2003), constructivism is not a curriculum design theory but rather a theory of learning. Therefore, while a lesson is described as constructivist, it does not need to adhere to a particular formula. Rather, a constructivist class is developed and implemented to maximize the learning opportunities for students, irrespective of the approaches employed. In his study, Windschitl (2002) explains that "constructivist teaching" is challenging to define because constructivist learning is conceptualized differently by various groups of theorists, depending on whether the emphasis is on individual cognitive processes or the social co-construction of knowledge. Constructivism primarily describes cognitive processes that adhere to a framework that explains how learners, as individuals, impose intellectual structure on their worlds. Conversely, constructivism stressing social strategies considers knowledge as containing both individual and social components and argue that it cannot be viewed as meaningfully distinct (Cobb, 1994; Saxe, 1992).

However, our argument is that a specific constructivist lesson design may not be adaptable; however, teachers must still adhere to certain criteria in order to label their classes as adopting a constructivist approach. Additionally, the recommended vital characteristics of constructivist classrooms could aid in assessing academic institutions and schools.

Windschitl (2002) indicates that specific attributes characterize teacher and student activity in a constructivist classroom, which is summarized in Table 1. These features are generated from the broader literature on constructivism and connect what he knows about how people learn with the types of classroom

conditions that maximize learning opportunities in meaningful ways.

Table 1: Summary of Teachers' and Students' Features in a Constructivist Classroom

[Adapted from the study of Windschitl (2002)]

Teachers' Responsibilities	Students' Responsibilities
- Elicit students' opinions and experiences concerning essential themes, then design learning circumstances	- Expound on or reorganize their existing knowledge.
- Offer students a variety of information resources and the tools (technological and conceptual) required to facilitate learning	- Use provided resources and tools in a conceivable way
- Apply complex and meaningful problem-bases activities	- Collaborate and participate in task-oriented conversations with one another.
- Promote students' independent and thoughtful thinking	- Utilize their own cognitive processes through conversation, writing, drawings, and other visual representations.
- Utilize various evaluation techniques to determine how students' ideas are developing and provide feedback on both the processes and outcomes of their thinking.	- Use what they know in different, real-world situations to explain ideas, interpret texts, predict events, and build arguments based on evidence, rather than focusing only on getting the "right answers."

Sharing some common points with Windschitl (2002) pertaining to the characteristic of a lesson to be deemed constructivist, Baviskar, Hartle, and Whitney (2009) indicate that a lesson's activities, structure, content, or setting must address four key elements, including "eliciting prior knowledge", "creating cognitive dissonance", "application of the knowledge with feedback", and "reflection on learning".

As analyzed in their research, Baviskar et al. (2009) demonstrate that if the educator lacks a method for eliciting students' prior knowledge, the new information cannot be given in a manner that facilitates its incorporation into the learner's construct. Similarly, if the student's attention is not called to their past knowledge, the learner will either disregard the new information or erroneously assimilate it. Consequently, eliciting prior knowledge might be considered the first crucial criterion for a constructivist classroom. The second criterion is cognitive dissonance creation. In this stage, the learner must recognize the difference between their prior knowledge and the new information (Inch, 2002; Sewell, 2002). The third criterion, "application of the knowledge with feedback," is consistent with the guidelines recommended in the study of Windschitl (2002). If learners do not interpret and change what they already know in light of what they are learning, they are likely to misunderstand or reject new knowledge. In addition to verifying the validity of their constructions, the application enables students to further define the interconnectedness of new knowledge to a wider range of settings, thereby integrating the new knowledge for good. The fourth criterion is a reflection on learning. Once the student has gained and validated the latest knowledge, the student must be made aware of the learning that has occurred. Even though the

reflection criterion is not required to be a formal component of the lesson plan, its existence makes the lesson notably more constructivist.

Table 2 provides a summary of the four necessary constructivist criteria, suggested activities for each linked measure from the study by Baviskar et al. (2009), and an exemplar of a scientific constructivist lesson incorporating the aforementioned critical criteria (Hopkins & Smith, 2011).

Table 2: Summary of Four Constructivist Criteria and Suggested Activities

Four Essential Criteria	Field Marks: Expected methods & learning activities	Exemplar: Leaf decomposition in streams (Hopkins & Smith 2011)
1. Eliciting prior knowledge	Demonstration, problems, focused listing, surveys, quizzes, interviews, discussions, concept mapping. Emphasis on eliciting student ideas.	Present students with a fresh and a decomposed leaf. Have students draw and list the processes that they think contribute to the change in the leaf.
2. Creating cognitive dissonance	Uncover misconceptions, compare lists, discuss missing information, demonstration, create discomfort. Pose a controversial question, or state/write a surprising or counterintuitive statement	Compare student drawings and lists. Explore relevant variables in decomposition. Reveal gaps in knowledge of the process.
3. Application of new knowledge with feedback	Formative assessments, feedback on new constructs, hypothesis testing, gain of new knowledge. Focus on process of gaining new knowledge, solving problems, design & logic of analysis and presentations.	Generate testable hypotheses, design and carry out experiments to manipulate variables related to the process of decomposition. Data analysis and summary of results, with feedback.
4. Metacognition (reflection on learning)	Repeat Step 1 and have students reflect on their own learning. Assignments should have students explain variables, processes, or derive conclusions from evidence. Reflective paper, presentation, field report, peer teaching.	Repeat initial leaf exercise & compare with initial drawings. Have students reflect on their new knowledge through presentations in a scientific format.

Obviously, the four preceding criteria would benefit teachers and academic evaluators in employing the heuristic constructivist teaching method efficiently and instructively.

4. Challenges for teachers when implementing the constructivist approach

Issues that teachers pursuing constructivism usually encounter were systematized into a framework by Windschitl in 2002, with four primary types: concepts, pedagogies, cultures, and politics. Since then, other researchers have contributed further findings to the categorization of reinforcements and illustrations.

4.1. Conceptual dilemmas

Whether the implementation of constructivism in class flounders or flourishes lies in the extent to which teachers comprehend the constructivist theory (Windschitl, 2002). Only when they truly understand the fundamentals of constructivism, such as what it is and what it requires, will they be able to adjust their instructions, assessments, and activities accordingly (Oakes, Hunter-Quartz, Ryan, & Lipton, 2000). However, as constructivism is a theory of learning, not of teaching or curriculum design (Richardson, 2003), and there have been no official models to follow (Fosnot, 1996), it is challenging for teachers to grasp constructivism clearly at its heart. Even those who consider themselves as

pursuers of constructivist epistemology may also unconsciously go back to the traditional mode of teaching (Windschitl, 2002). An instance can be found in Tobin's study (1993) in which the author described a constructivist teacher who sometimes gave immediate and direct feedback to his students' answers rather than let them discover the accuracy themselves. The implication is that without sufficient comprehension and practice, implementing constructivism in classrooms is not an achievable task.

Further, the lack of constructivism knowledge, or worse, superficial understanding may result in the distortion of the approach's nature and applications (Cobb & Yackle, 1996). For example, in the study "Using computers to create constructivist learning environments: Impact on pedagogy and achievement", Huffman, Goldberg, and Michlin (2003) did not illustrate the learning environment as claimed because, in their lessons, neither prior knowledge nor the Zone of Proximal Development was activated (Baviskar, Hartley & Whitney, 2003). Consequently, it is crucial that teachers be given proper and thorough training before constructivism can be adequately implemented in class.

Key concepts of the constructivist approach such as definition, Zone of Proximal Development, prior knowledge, and four proposed criteria for constructivism (Baviskar, Hartley & Whitney, 2003) need to be fully conveyed to teachers. Skillfully, the teacher training process should be conducted in the constructivist model so that teachers can soundly conceive of themselves as learners before they can assist their students (Windschitl, 2002).

4.2. Pedagogical dilemmas

Constructivist classrooms feature students' active involvement and interactions, yet this does not equate with the thought that the teacher's job is less important. On the contrary, teachers are required to embrace even more prominent and higher responsibilities (Cohen, 1998) as they need to design their lessons and modify instructions using a variety of facilitative activities to support students' acquisition (Windchitl, 2002). Another pedagogical challenge is that teachers must put in their best endeavors to be aware of their students' background knowledge, skills, and mental development (Gallimore & Tharp, 1990). This is to guarantee that opportunities for proximation are maximized. Such a task is even more demanding in classes where individual differences such as abilities, prior knowledge, and critical thinking are utterly disparate.

Expertise in the subjects is another obstacle that teachers must face, especially in this modern age when information is frequently updated (Windschitl, 2002). Teachers who do not fully comprehend what they are teaching are more likely to find themselves presenting facts rather than constructing the lessons in an interactive way (McLaughlin & Talbert, 1993). Additionally, how to assist students in working well with other partners in the group is another issue for teachers. Slavin (1995) argued that competent learners usually had the tendency to dominate or exclude less competent partners' work, leading to negative consequences such as inferiority feeling or academic freeloading.

These pedagogical factors act as deterrents to a successfully implemented constructivist classroom. It is pivotal that teachers frequently enhance their expertise, pay attention to students' individual differences, and manage group work more closely. More importantly, teachers' pedagogies should be premised on adequate understandings of constructivism so that instructional and facilitative classroom activities do not deviate from the constructivist epistemology.

4.3. Cultural dilemmas

According to Windschitl (2002), cultural issues evolve between teachers and students during the

drastic reorientation of classroom roles and expectations required by the constructivist philosophy. Creating patterns of beliefs and actions that are consistent with a constructivist worldview is highly challenging for teachers when one considers the ingrained school culture that must be overthrown. In a study of evolving middle schools, Oakes et al. (2000) found that most teachers, administrators, and parents expected a classroom to be quiet and disciplined, with students sitting down and not talking to each other. Students were engaged when they paid attention without talking, gesturing, creating something new, or moving around. In Asian countries, where cultural traditions such as Confucianism have a substantial impact on educational systems, learners' passivity and classroom silence may be more prevalent (X. J. S. Cheng, 2000; Hanh, 2020; Nakane, 2006). Hence, it is not difficult to deduce from such research and our experience as academics that the dominating culture in schools is one of adapting and compliance, in which teachers control intellectual activity to ensure consistent input to the curriculum and to preserve obedience. In reaction, students become passive spectators over time rather than willing participants in their own learning.

Confucian heritage culture (CHC) refers to environments influenced by Confucianism. This is an ethical and philosophical system based on the teachings of the Chinese philosopher Confucius. Confucianism is based on humanism, which emphasizes spiritual care for society and the family. Confucianism has significantly influenced many Asian countries, namely China, Taiwan, Korea, Japan, Vietnam, and Singapore (Hằng, Meijer, Bulte, & Pilot, 2015). Some defining characteristics of Confucian heritage culture may have influenced the responsibilities of instructors and students in the classroom. As a result, it is argued that critical attributes of CHC may make it challenging for instructors and students in such nations to implement social constructivism.

According to Confucian heritage culture, learning is performed through collective ways, mainly by seeing those who are virtuous role models. Consequently, Confucius urged students to be respectful and maintain social harmony during learning (Berthrong & Berthrong, 2000). In order to demonstrate respect for others, students are frequently socialized to listen intently and ask questions only when they have fully comprehended others or when encouraged to do so (Hằng et al., 2015; Wang, 2003).

In addition, the fundamental goal of Confucianism is to construct a stable and well-ordered society, and it emphasizes hierarchical structure (Berthrong & Berthrong, 2000). In cultures with a Confucian heritage, hierarchical relationships are reflected by respect for age, status, and ancestry. Therefore, superior and inferior subjects are determined by human relationships and social communications. Sacrilege is avoided, and patriarchal behaviors are encouraged to sustain the hierarchical order of Confucian legacy culture (Hằng et al., 2015). This characteristic may account for the hesitation of Asian and Vietnamese students to actively participate and ask questions in class (X. Cheng, 2000).

In short, the aforementioned characteristics are supposed to have influenced all facets of Confucian heritage culture, particularly the tradition of respecting teachers and appreciating moral values. Hence, the researchers of this current study believe that culture is identified as one of the challenges Vietnamese teachers face in implementing the social constructivist approach. In addition, it is crucial to comprehend the relationship between social constructivism and the influence of Confucianism or Vietnamese culture to present reasoning with recommendations and arguments for how social

constructivist techniques can be effectively implemented in academic contexts in Vietnam.

4.4. Political dilemmas

Windschitl (2002) defined "political" issues in constructivism as aspects linked with authority redistribution among teachers, students, parents, school leaders, and policy makers. Traditionally, teachers are excluded from the decision-making of curriculum and assessment schemes; they only enact the policies imposed by high-level leaders (Apple, 1982). This results in the negative consequence that teachers alter their lessons to the test itself (Rowan, 1990), impeding their effort to adjust their teaching to suit individual learners (Darling-Hammond, 1996). Moreover, O'Connor (2020) postulated that schools and policy leaders did not modify curriculum or assessment shemes accordingly when trying to apply the constructivist approach in classrooms. In contrast, these aspects were regarded as interchangeable between teaching approaches and structures, which may lead to "a limited interpretation of what constructivist teaching entails and an inattention to the conditions required for its practice" (O'Connor, 2020, p.1). As a consequence, it is difficult for teachers to follow the curriculum, meet learning objectives, and assess their students appropriately while still adhering to constructivism. Another difficulty for teachers is the pressure they need to bear from the expectations of schools, students, and parents (Tobi, 1993). As teachers themselves may not fully comprehend the essence of constructivism, it is not feasible for them to convince educational stakeholders to believe in the effectiveness of such a learning approach.

Such external challenges are far beyond teachers' control, requiring profound actions from institutional leaders. Whether constructivism can be effectively implemented should be the responsibilities of multiple parties, not only teachers. Class facilitators must be listened to, understood, and given tutelage in a proper and timely manner during the application of the constructivist approach.

4.5. Technological dilemmas

Technologies play a pivotal part in education (Lewis, 2013), especially in a twenty-first-century constructivist class; the tools help learners think more critically and "test their ideas in a practical meaningful context" (Mustafa & Etma, 2013, p.1442). However, benefits come alongside with drawbacks. As little information about instructional technology was discussed in Windschitl's framework (2002), it is essential to synthesize common difficutlies teachers often confront in constructivism implementation.

Ertmer et al. (2012) classified technological barriers into two primary kinds: external and internal problems. The former is related to the lack of resources, insufficient training, and time-consumption while the latter includes issues such as teachers' belief, attitude, and knowledge. In the study of Ramorola (2013) on technological challenges South African teachers often faced, similar issues were found. The result, through interviews, observations, and document review, showed that insufficient resources, lack of time, unavailable training procedure, technology phobia, and lack of teachers qualified in technology were common deterrents to technology integration into teaching. Although the context of Ramorola's research may not be similar to others', the findings should be taken into careful consideration before the technology is incorporated into classrooms.

As research into issues regarding technology in constructivist classes is still limited, more studies need to be conducted to thoroughly understand what may have been challenging teachers, especially in the modern time. Proper measures could be taken to mitigate the core problems from a better comprehension of the situation.

5. Suggestions

From the detailed analysis of common dilemmas teachers usually encounter when implementing the constructivist approach in class, it is apparent that pursuers of constructivism must be perseverant. This is comprehensible as constructivism is a learning theory focusing on the agents as learners. Therefore, success can only be achieved if teachers can overcome such barriers with the support and guidance of more experienced personnel. Furthermore, all of these dilemmas need to be viewed collectively, not individually, as they may occur simultaneously with one leading to another. For example, inappropriate instructional strategies (pedagogical) may result from the lack of understanding of constructivism (conceptual) and the lack of learning devices (technological). In other words, existing problems, if any, must be tackled as many as possible before the implementation of constructivism in classrooms.

Sufficient training and practice can overcome issues vis-à-vis the conceptual dimension. Teachers should be trained by experts in the field in a constructivist way so that they can actually comprehend what it is like being in a student role (Windschitl, 2002). Concepts of constructivism such as definition, key features, the four criteria model, and Zone of Proximal Development must be fully mastered by teachers. However, understanding is only the starting point, as frequent rehearsals should be made to assure familiarity and confidence. As proved by Cobb and Yackle (1996), half-way or superficial understanding may distort the approach and its own nature, leading to skewed outcomes. As for how to help teachers to be qualified, various ways could be adopted such as workshops, seminars, or, as mentioned, a formal training class.

Upon the mastery of constructivist concepts, teachers are required to modify their activities and instructions in a facilitative way. They must remember to adopt the role of an instructor or a guide, not a teacher, in the traditional view; in other words, they are expected to design strategies to buoy students' construction of their knowledge via interactive and communal activities. To achieve this, teachers need to understand where their students' background knowledge and mental development are, from which appropriate tasks are planned to activate students' prior knowledge, to create the problem that needs discovering, to foster critical thinking skills and self-research via group work, and to finally connect what they knew with what they have just learned. Additionally, teachers are expected to frequently develop their profession because this will help them stay more focused on the constructivist approach. In effect, only when teachers have expertise in what they are teaching are they able to create tasks that assist their students in discovering new knowledge, not just presenting it (McLaughlin & Talbert, 1993).

With the cultural traits and differences between nations revealed by this study's literature, the study asserts that curriculum development must be based on a thorough evaluation of past local experience (Coll and Taylor, 2012) and should take cultural resources (Neuman and Bekerman, 2000) into account to avoid a false universalism (Nguyen et al., 2009) and to reduce practical difficulties (Serpell 2007). A culturally compatible curriculum based on a social constructivist framework seems promising for education systems in various locations. According to Wong (2004), the longer students study in Australia, the more likely they are to adopt and adapt to the Australian teaching and learning style. Social constructivism may be a passionate approach to education because it encompasses the whole person's thoughts, emotions, and actions and encourages all members of a learning community to express their beliefs with conviction while remaining open to the perspectives of others (Beck and Kosnik 2006). Hence, a curriculum based on social constructivism that is built correctly and

appropriately for each culture could reflect the development and history of social constructivism in education.

Finally, political issues are the most difficult to cope with as they belong to external factors beyond the control of teachers. Educational stakeholders and policymakers should re-design the curriculum and assessment schemes to best fit constructivist classes. It is highly recommended that teachers be involved in the design process, not only being the agents to enact regulated policies. Furthermore, constructivism, in particular, and other innovative changes, in general, should be considered with an open mind to ameliorate the anxiety and pressure teachers have to bear.

6. Conclusion and recommendations

With detailed analyses of the constructivist approach and its key features, this paper provides in-depth information about barriers commonly confronted by teachers when pursuing constructivism in class. There are four significant dilemmas for constructivist teachers: conceptual, pedagogical, cultural, and political, which were proposed by Windschitl (2002), coupled with the technological problems postulated by Ertmer et al. (2012). Teachers are recommended to gain sufficient knowledge of the approach before implementing it, adjust their facilitative strategies accordingly, understand the diverse cultures in the classroom, and negotiate with schools, parents as well as students about the curriculum, assessments, and changes. The paper also highlights three gaps in previous studies that need to be addressed. First, more research should be conducted to explore whether EFL/ESL teachers, specifically university lecturers, fully understand constructivism. Second, in this modern age, technologies can bring tremendous value to teaching and learning practices, yet they are still under-examined in what cases they may be problematic. Finally, a model of effective learning using constructivism should be experimented with and proposed so that teachers and students in different contexts have a standard and reliable sample to follow.

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