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ABSTRACT

This study investigated the readiness of teachers towards implementing project-based learning (PjBL), mandated by a top-down policy at the national level, in Qatari government primary schools. With multiple qualitative data, the study reported a lack of readiness among teachers at the initial stage of change. Despite good intentions, the change message was not successfully communicated to the change recipients, i.e., teachers. Teachers' lack of understanding of PjBL served as a major reason for difficulties encountered, including their low confidence in implementing PjBL and their inability to recognize the appropriateness or acknowledge its potential benefits. Nevertheless, teachers from a supportive school environment reported positive attitudes and perceptions of valence. Accordingly, system support and effective professional development are crucial for teacher readiness to implement PjBL.

Keywords: teachers' readiness for change; nation-wide educational change; project-based learning; primary education; Qatar

Introduction

Project-Based Learning (PjBL) has been implemented as an effective approach to achieving student-centered learning in education, with an emphasis on a wide range of skills needed for the twenty-first century (Ravitz, Hixson, English, & Mergendoller, 2012). While the effectiveness of PjBL in higher education has been well-documented over the decades, a few studies have provided positive evidence of PjBL's impact on student learning in K-12 classrooms (Kokotsaki, Menzies & Wiggins, 2016). Although considered feasible and useful for even younger learners, there is a need for more research on PjBL in primary educational settings (Kokotsaki, Menzies & Wiggins, 2016), particularly when it is implemented at a systemic level (Wurdinger, 2016).

Implementing PjBL at a national level demands serious change at several levels institutionally—support from leadership, infrastructure facilities, transformation of curriculum, adjustment of assessments, and most importantly, the engagement of teachers who are the main actors of implementation (Fullan, 2007, 2014; Moesby, 2004). Such engagement in PjBL demands a considerable change to teachers' roles, from knowledge-transmitter to facilitator of independent, self-regulated and self-directed learning (Du, Su & Liu, 2013). Accordingly, teacher readiness for change, i.e., their understanding, confidence, positive attitude, and motivation towards PjBL, is an important factor influencing the successful implementation of system-wide change (Adelman & Taylor, 2007; Bliss & Wanless, 2018). Specifically, for top-down initiatives, the readiness of teachers for change becomes of particular concern (Bouckenooghe, 2010; Bouhuijs, 2011; Kolmos, 2012).

In the State of Qatar, following Qatar's National Vision 2030 (General Secretariat for Development Planning, 2008) for moving the country from an oil-based economy to a knowledge-based society, all educational institutions are encouraged to adopt innovations in pedagogy aimed at developing students' twenty-first-century skills (Al Said, Du, ALKhatib, Romanowski & Barham, 2019). Several other policies continue to follow from various sectors of government. Particularly, the most recent policy issued by the Ministry of Education and Higher Education (MOEHE) documents the introduction of PjBL into primary classrooms. Although Problem-Based Learning has been piloted in mathematics classrooms in a few selected schools (Al Said, Du, ALKhatib, Romanowski & Barham, 2019), this is the first time that PjBL has been implemented in Qatari government schools at a systemic nation-wide level. Either Problem-Based Learning or Project-Based Learning remains a new phenomenon in the Gulf Region in general, particularly in Qatar (Du, Ebead, Sabah, Ma & Naji, 2019; Du et al., 2016). In the context of Qatari government schools, over 80% of teachers have been recruited from neighboring Arabic-speaking countries,

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which has added the complexity of their varied educational backgrounds and prior experiences to educational change (Du, Chaaban, & AlMabrd, 2019; Ellili-Cherif, Romanowski, & Nasser, 2012).

As teachers are key players in educational change, it is necessary to voice their perspectives in order to understand their personal attitudes, needs, and beliefs. A better understanding of the readiness of change recipients, i.e., teachers in an educational setting, is key in making implementation of change more successful and sustainable (Fullan, 2007; Holt, & Vardaman, 2013; Vakola, 2013). Alternatively, when teachers are not ready for the change, they may have a higher risk of negative attitudes and resistance (Fullan, 2014), which will limit their own engagement and deprive their students of long-term positive results in achievement (Moesby, 2004). Therefore, this study aimed to provide a comprehensive picture of teachers' readiness to implement educational change such as PjBL from three different perspectives: teachers, school principals, and professional development (PD) facilitators.

In this study, the abbreviation of PBL is used to refer to literature that is focused specifically on Problem-Based Learning, and PjBL is used to address the focus on Project-Based Learning. Following official documents from MOEHE in Qatar, the current study has been concerned with teachers' readiness for implementing PjBL.

Literature Review

Project-Based Learning

Often defined as "an instructional (and curricular) learner-centered approach that empowers learners to conduct research, integrate theory and practice, and apply knowledge and skills to develop a viable solution to a defined problem" (Savery, 2006, p. 9), PjBL has been implemented extensively for several decades in diverse educational settings. Several studies have documented the characteristics, principles, and criteria of PjBL. For example, in a review study, Thomas (2000) suggested five criteria of PjBL, including centrality, driving question, constructive investigation, autonomy, and realism. In the context of foreign language education, three major features of project work include: (1) learners participate in research on authentic topics through communication with texts and people, (2) learners generate meanings and construct their own outcomes in the process, and (3) learners present their results via written or oral form to an audience (Stoller, 2006). Recent literature on PjBL in schools also links project topics to media and community (Boss & Krauss, 2014) and focuses on integrating technology in the discovery, communication, and collaboration phases of the project process (Boss & Krauss, 2014). It is also suggested that assessment procedures should be constructively aligned with overall learning objectives and curricular standards (Du, Abead, Sabah, Ma & Naji, 2019).

Over the decades, prevailing literature on PjBL has generally yielded positive results on several aspects of student learning and achievement in higher education (Kokotsaki, Menzies & Wiggins, 2016). In a K-12 setting, a few review studies have reported positive effects on students' learning, motivation, attitudes, behaviors, preferences, and skills when a PjBL or PBL methodology is adopted (Dole, Bloom & Doss, 2017; Merritt, Lee, Rillero, & Kinach, 2017). Specifically, Kaldi, Filippatou, and Govaris (2011) found improvement in motivation levels and gains in content knowledge and teamwork skills of pupils when a project-based learning methodology was implemented in science classes. In addition, students developed positive attitudes towards peers from diverse social and ethical backgrounds and became less favorable of traditional teaching versus experiential learning.

Further, an experimental study conducted by Drake and Long (2009) in two fourth-grade classrooms revealed considerable growth in content knowledge and test scores for the students in the PBL classroom in comparison to the students in the control group, who were taught using the direct instruction method. Grant (2011) reported that in eighth-grade PjBL science classes, students developed motivation, self-direction, autonomy, and technology integration skills through project-based learning methods. Tamim and Grant (2013) also reported improved collaboration and reflection skills of students from different schools. Jerzembek and Murphy (2013) found that, compared to traditional methods, PBL had several positive results on students, including: (1) improvement of student understanding, (2) acquisition of organizational skills, (3) development of critical thinking and problem-solving skills, (4) enhancement of students' self-efficacy and self-confidence, and (5) improvement of social and leadership skills, among other benefits.

Nevertheless, these identified results were mostly obtained from secondary classrooms, and further research is called for in primary educational settings. Although it is believed that in primary PjBL classrooms, "students gain important knowledge, skills and dispositions by investigating open-ended questions" (Krauss & Boss, 2013, p. 5), existing studies on primary mathematics and science classrooms reported unclear patterns in the ways that PBL influenced student performance (Drake & Long, 2009; Merritt, Lee, Rillero, & Kinach, 2017). Therefore, there is a need for further studies on both PBL and PjBL in primary education, not only in mathematics and science, but in all subjects (Duke, Halvorsen, & Strachan, 2016; Jerzembek & Murphy, 2013; Tamin & Grant, 2013).

A Model of Teacher Readiness for PjBL

Despite the positive results of PjBL and its successful implementation in many educational contexts, nonetheless the approach remains an innovation in contexts where traditional teaching and learning prevail. Therefore, the literature on educational change becomes relevant for understanding the introduction of PjBL in the context of the current study.

Research on change management has consistently stressed the importance of readiness for change (Armenakis & Harris, 2009). In their systemic change model for school achievement, Adelman and Taylor (2007) emphasized that creating readiness among all stakeholders is the first important step to enhancing the chances of adoption and then institutionalization of the desired change. Readiness may be defined as "the cognitive precursor to the behaviors of either resistance to, or support for, a change effort" (Armeakis, Harris & Mossholder, 1993, p. 681). In the current study, we follow Holt and Vardaman's (2013) definition of initial readiness, and operationally define teacher readiness as the degree to which teachers are individually and collectively primed, motivated, and capable of executing change.

Based on Lewin's model of unfreezing, moving, and freezing and Bandura's social learning theory, a model of readiness for change was proposed by Armenakis, Harris, and Mossholder (1993) and Armenakis, Harris, and Field (1999). This model suggests five key areas when addressing the change message: discrepancy, appropriateness, efficacy, principal support, and valence. Discrepancy involves explaining to change recipients the presence of a gap between the current state of the organization and the desired state. Efficacy focuses on the confidence of the change recipients that the organization and themselves have the ability to successfully implement the change, and their confidence that leaders are serious about the change and will provide the necessary support to ensure successful implementation. Lastly, the benefits of the change should be clarified so that recipients are able to believe in personal gains as a result of successful implementation. Over the decades, the readiness for change model has been critically evaluated with empirical studies and has been regarded as a useful framework for initiating change (Armenakis & Harris, 2009; By, 2005), as well as analyzing and assessing whether or not change recipients are ready for the targeted change (By, 2005; Holt & Vardaman, 2013).

When applying this model to the implementation of PjBL within an educational institution, it is important to ensure that teachers: (1) understand PjBL and the need for implementing PjBL in order to reach aspired goals (discrepancy), (2) believe the implementation of PjBL will fit the current gap and be appropriate to help the school reach such goals (appropriateness), (3) feel confident in their own and the schools' ability to implement PjBL usefully (efficacy), (4) feel confident in receiving sufficient support to implement PjBL from the school and government (principal support), and (5) believe that implementing PjBL will benefit them personally (valence). The fact that the change message is influenced by these five key beliefs requires special consideration during the implementation of PjBL in the context of the current study.

Furthermore, researchers have also identified three particular factors that may influence change efforts: (1) the content defining what should be changed, (2) the process of how the change is implemented, and (3) the context in which the change takes place (Armenakis & Harris, 2009; Walker, Armenakis & Bernerth, 2007). Content issues refer to the actual change being implemented, for example, introducing PjBL in an educational setting. The decision to implement PjBL may be made in an effort to bridge the gap between the schools' established practices and the requirements of educational reform in a global or national context. Process issues refer to the actions (e.g., introducing PjBL) taken by change agents during the introduction and implementation of the proposed change. Throughout the change process, the importance of communicating the change message efficiently is emphasized (Armenakis & Harris, 2009). Contextual issues refer to the challenges existing in an organization's external and internal environment prior to the introduction of the change (Walker, Armenakis & Bernerth, 2007). The decision to implement PjBL may be impacted by external demands such as educational reform and societal needs, or by internal demands such directives imposed from school leadership, low educational outcomes, or student needs (Fullan, 2007; Kolmos, 2012).

Teachers play a crucial role in implementing pedagogical innovations such as PjBL (Bliss & Wanless, 2018). Consequently, teachers are expected to have high motivation, positive attitudes, and an equally sophisticated ability to implement PjBL (Adelman & Taylor, 2007; Bliss & Wanless, 2018; Bouhuijs, 2011; Kolmos, Du, Dahms & Qvist, 2008). Further, teachers' beliefs in the appropriateness and benefits of PjBL and PBL to their student learning, as well as how confident and capable they feel, impact the results of their implementation (Al Said, Du, ALKhatib, Romanowski & Barham, 2019; Du, Chaaban, & AlMabrd, 2019). Previous studies also suggest that teachers' self-efficacy beliefs impact their implementation of innovation (Suprayogi, Valcke & Godwin, 2017). Fullan (2007, 2014) highlights that teachers' behaviors, attitudes, and beliefs are key factors influencing the sustainability of implementation. Specifically for top-down initiatives, the readiness of teachers for change becomes crucial for successful implementation (Bouckenooghe, 2010; Bouhuijs, 2011; Kolmos, 2012).

Challenges Hindering Readiness for Change

While suggesting that the focus of change should be on the human factor, Kotter and Cohen (2002) also point out that major challenges arise as a result. Vakola (2013) suggests that barriers to readiness for change may exist at both individual and organizational levels.

At a very basic level, teachers, as change recipients, need to exhibit proactive and positive attitudes towards change and support an initiative with high levels of confidence (Vakola, 2013). However, teachers may resist or fail to change when they lack motivation and self-efficacy beliefs in the designated change (Hmelo-Silver, 2012; Fullan, 2007, 2014; Rico & Ertmer, 2015; Tamin & Grant, 2013). Furthermore, teachers' lack of understanding and prior experiences with PjBL methodology (Tamin & Grant, 2013; Thomas, 2000), as well as their pedagogical beliefs (Rico & Ertmer, 2015), may become barriers in the implementation process. In addition, teachers' and students' lack of collaboration skills may become challenges to PjBL implementation (Ertmer & Simons, 2006; Tamin & Grant, 2013). A recent study in Qatar (Al Said, Du, ALKhatib, Romanowski & Barham, 2019) found that after three years of implementing PBL in primary classrooms, mathematics teachers reported discrepancy between their perceived beliefs towards change and their actual practices, which was attributed to several challenges, including difficulty in facilitating student collaboration and a lack of teamwork expertise.

At an organizational level, structural factors, which include the circumstances under which the change must occur and the extent to which these circumstances enhance or inhibit the implementation of a change, influence the perceptions of organizational readiness (Holt & Vardaman, 2013). Implementing educational change is highly contextual, and therefore support from the system and environment is highly needed (Lam, Cheng & Choy, 2010). Even with increases in PBL and PjBL implementation in higher educational settings (Du, et al., 2016; Du, Ebead, Sabah, Ma, & Naji, 2019; Frambach, Driessen, Chan, & Van der Vleuten, 2012), structural constraints remain, including additional workload and unchanged assessment systems, a lack of resources, and a lack of peer and administrative support. To create readiness at this level, Armenakis and Harris (2009) describe several strategies change agents can use to convey the change message, including active participation, persuasive communication, and training and development.

In the context of the current study, PjBL was implemented at a systemic level following the decision by MOEHE. Thus, it was necessary to investigate teachers' readiness—whether they were ready to implement such a change effort with high motivation, positive attitudes, and an equally sophisticated ability to adapt to change. With this aim, two research questions guided the current study:

1. How are teachers' readiness to change to PjBL perceived by teachers themselves, school principals, and professional development (PD) facilitators?

2. What are the challenges hindering teachers' readiness to implement PjBL?

Method

Research Context

In June 2017, all Qatari government schools received notice from MOEHE initiating a pedagogical change that introduced PjBL to primary classrooms in four subjects: mathematics, science, Arabic, and English as a Foreign Language (EFL). In August 2017, a guidebook for each subject was sent to schools defining the frames and schedule of PjBL for the 2017-2018 academic year. Initially, the guidebook mandated that six class sessions (50 minutes per session) be assigned for the implementation of PjBL in EFL. In September 2017, a decision was made from MOEHE that the sessions would be reduced to only two.

During these two contact hours (two sessions), teachers were required to present the project topic during the first-class session at the beginning of the semester, and then organize students to present project outcomes in the second class session. Students were expected to work in teams assigned by teachers, with one student appointed as a team leader. The topics for the first project were mostly suggested by the MOEHE in relation to the Qatari culture. An example of a student project was tourism, in which students worked on designing a product introducing tourism in Qatar to newcomers. The project could be presented in any form—a poster, a flyer, a brochure, or a travel plan. Other examples of topics included recycling, healthy food/diet, or public awareness for road safety. Students mainly worked in their spare time on the projects as only two sessions—project start and end—were allocated during classroom time. All other class sessions during the semester were to be taught in the regular method to fulfill curriculum standards.

All schools were provided with resources by MOEHE that could be used to design projects, such as fabric, materials, posters, etc. Several examples and templates for lesson planning and teacher reflection were distributed to teachers. Teachers were to fill in these forms before and after the PjBL sessions. Peer assessment forms and reflection forms for students were also provided. Student assessment was

not impacted by the introduction of PjBL into the curriculum. Students would still be assessed in the usual assessment methods.

In addition, two levels of professional development activities were provided by MOEHE. At the end of August 2017, a two-day workshop was organized in which one teacher from each school (mostly EFL coordinators in the current study) was required to attend and learn how to implement PjBL presented by an expert from abroad. Afterwards, each school could organize school-based training sessions allowing the teacher who attended this workshop to train other teachers in the same department.

Research Design

The prevailing method for examining recipients' readiness for change has been based on quantitative methods and inventories, which aim to obtain a general understanding at the organizational level (Holt & Vardaman, 2013). Nevertheless, researchers also stress that individual recipient's readiness towards change is situational (Vakola, 2013). Therefore it was necessary to explore the participants' deep opinions and affective reactions to the change. More specifically, there is particular sensitivity to the process of change when it is implemented in a top-down approach (Kolmos, 2012). Rather than aiming to assess teachers' readiness, the current study aimed to understand teachers' experiences and opinions. Therefore, a qualitative research design was employed in order to provide deep understanding and insights into teachers' lived experiences (Patton, 2002). In-depth interviews were used as the major data source to explore teachers' readiness to implement PjBL from multiple perspectives: teachers, school principals, and PD facilitators. Empirical work was conducted during the very initial stages of implementing PjBL in Qatari government schools as mandated by the Ministry.

Participants

Upon receiving approval from MOEHE and the university research ethics office in October 2017, several schools were approached by email calling for volunteers in the study. In the process of recruiting participants, a purposive technique was employed by taking participants' background into consideration to ensure diversity in representation of geographical areas, teaching experience, and ethnic backgrounds (Patton, 2002).

A total of 21 participants volunteered to participate in this study, including 11 elementary teachers from seven different schools, three school principals (one principal and two academic vice principals), and seven PD facilitators (three from the National Center for Educational Development, three from the MOEHE, and one from a state-run organization named Teach for Qatar). All participants either worked as EFL teachers or were responsible for their professional development. Except for one PD facilitator, the other nineteen participants were females. This is mainly because the educational field, specifically at the elementary level, has a majority of female staff. Nine of the participants were Qatari, and the rest were Arabic native speakers who were born in Qatar or had lived in Qatar for 10-20 years. The participants ranged in age from their late 20s to their late 40s. Their teaching experience ranged from two to over 20 years.

Data Collection

Multiple sources of data were generated in this study—interviews with all of the 21 participants, observations carried out in four PjBL classes, and content analysis of PjBL lesson plans and reflection forms provided by eight of the interviewed teachers. The three sources of data were collected and analyzed separately, and later triangulated and integrated at the interpretation stage (Punch & Oancea, 2014).

In-depth interviews provided opportunities to deeply understand participants' experiences, thoughts, and feelings (Kvale & Brinkmann, 2009). Face-to-face interviews with all participants lasted 30-60 minutes. During the interviews, participants were asked questions about their understanding of and need for PjBL and past experiences with PjBL. Questions further tapped into their perceptions of the effectiveness of PjBL, the roles of the teacher in a PjBL environment, how PjBL is and should be implemented, the challenges they had experienced, and the support practices needed for implementing PjBL in their context.

Non-participant observation data were generated to supplement and triangulate data gathered from other techniques (Punch & Oancea, 2014). During the semester, each teacher was requested by the MOEHE to conduct two PjBL sessions. Only four teachers volunteered to accept our non-participation observation, yielding a total of four PjBL observations lasting 50 minutes in each classroom. Field notes were collected during the observations, including PjBL activities, procedures, and teacher-student/student-student interactions.

Data Analysis

The overall analysis process was conducted by the authors individually and collaboratively through several rounds of comparing multiple data sources. The PjBL guidebook, lesson plans, and evaluation forms were reviewed prior to the interviews, which provided background information regarding the definition of PjBL, intended objectives and learning outcomes, as well as mandated procedures and evaluation methods. This review also helped generate specific interview questions.

A content analysis technique was used to analyze the interview transcripts and teachers' documents such as lesson plans and reflection forms. The analysis focused on meanings and context, and provided a condensed description of the phenomenon (Elo & Kyngaes, 2008).

The interview data were analyzed following these steps: firstly, interview data were audio-recorded and transcribed for coding. Secondly, the model of readiness for change, specifically the five key beliefs of change message—discrepancy, appropriateness, efficacy, leadership support, and valence—was used to guide the interview analysis in response to the first research question. Several rounds of categorizing meanings in the data were conducted to ensure the suitability of the theoretical framework to the aims of the present study (Kvale & Brinkmann, 2009). Next, in response to the second research question, the contextual challenges that teachers faced in their attempt to implement the requirements of PjBL as mandated by the MOEHE were analyzed thematically using the constant comparative method (Punch & Oancea, 2014). Emerging themes and categories were compared among the different groups of participants as well as within these groups in order to generate reasonable conclusions that were contextually embedded rather than identified a priori.

Due to limited access, observation data—mainly field notes—played a supportive role to partially understand how the teachers initially practiced PjBL and to triangulate interview data.

Findings

Reports of findings to the first research question on perceived teachers' readiness were structured following the model of readiness for change (Armenakis & Harris, 2009; Armeakis, Harris & Mossholder, 1993; Holt & Vardaman, 2013). To answer the second research question, the challenges hindering teachers' readiness for change to PjBL were structured following the three factors—content, process, and context (Holt & Vardaman, 2013; Walker, Armenakis & Bernerth, 2007).

Perceived teachers' readiness for change to PjBL

Drawing upon multiple sources of qualitative data, the analysis of the five beliefs played a pivotal role in clarifying the level of teachers' readiness for change to PjBL.

Discrepancy

Findings identified among participants a clear lack of understanding of PjBL, which further led to them being unable to see the need for change. Examining participants' understanding of PjBL revealed consistent results among teachers and school principals. The majority lacked any prior experience with PjBL and possessed limited knowledge and skill in implementing the approach inside their classrooms.

For instance, some participants (Teachers A, C, E, D, M) avoided giving a clear-cut definition of the term when prompted. Other participants (Teachers R, F, B, S, E, J) provided inaccurate descriptions of PjBL, which in particular cases resembled the content of the change message they had received from the MOEHE. One definition given was: "PjBL is a project that is student center, where I only give them the idea of the project and they must do it by themselves" (Teacher J).

As further confirmed through observation data, students were engaged in end-of-unit projects, rather than PjBL. Examples of projects assigned to students included making a healthy meal, creating models of the seasons in empty bottles, presenting pictures of places in Qatar, and retelling information about a famous person. As a result, most teachers did not see the need to change their practices, as they understood the project topics as being similar to the topics in the EFL textbooks, as one teacher said, "I am not sure what is the difference, the topics for the projects are already taught in the textbook." (Teacher E)

Interviews with the PD facilitators and school principals reported similar concerns that teachers were not ready for the change to PjBL, since the majority of teachers had no prior PjBL experiences. In fact, interviewed principals admitted their own lack of knowledge and understood their need for training in PjBL prior to further implementation. Being aware of teachers' lack of training and understanding of PjBL, the PD facilitators unanimously agreed that teachers were not yet ready to implement PjBL in their subject matter, as one PD facilitator commented: "The implementation in the school that we observed for two months is totally different from the image that the Ministry of education designed… the teachers were not seriously trained and of course they could not do it properly" (PD Facilitator I).

Despite limited observational data, it was possible to note this general lack of understanding of PjBL. The PjBL guidebook depicted a detailed picture of the way PjBL should be implemented, such that students took responsibility in searching for information, finding answers to authentic problems, and developing communication skills through teamwork. However, during the observation of PjBL end sessions, students presented project outcomes that mainly depended on resources provided by their teachers. With very limited information and insufficient time to fully prepare a PjBL lesson, teachers designed the projects for the students. When students were hesitant to present within their groups,

the teachers mostly appointed representative speakers from each group, so that the class schedule could include all presentations within 50 minutes.

The teachers' lack of understanding of PjBL was also reflected in their lesson plans. Among the received PjBL lesson plans, project topics (as suggested by MOEHE), relevant activities, and student team formation were all decided by the teachers. Little planning addressed the way students should conduct teamwork and what they should do to take responsibility of their own learning. The lesson plans were written using the template provided by the MOEHE for regular classes, and four of the lesson plans were almost identical to regular class lesson plans.

Evaluation forms, as part of the lesson plan documents, were required by the MOEHE. The evaluation forms for PjBL preparation were found to be similar to those for regular classes, mainly focusing on evaluating whether the curriculum objectives were addressed or not instead of students' project processes. Despite their confusion about PjBL, most of the teachers reported in the forms that they found PjBL useful and beneficial, since, as they explained in the interviews, they did not want to be "seen as troublesome or stupid."

Appropriateness

The results of the current study revealed a relation between participants' experience with and understanding of PjBL and their ability to consider its appropriateness. For instance, only one teacher (Teacher R) had prior experience with PjBL as a college student, and she strongly believed that PjBL would be an effective way to learn English. Two teachers had some knowledge about PjBL without experience, and they also believed that PjBL could potentially be useful for their students, if they had received the proper training. Among the majority of the interviewed teachers who had no prior knowledge or experience with PjBL, half of them expressed the belief that PjBL may be helpful if the teachers possessed the necessary skills, while the other half were unable to articulate whether PjBL was an appropriate change or not.

By contrast, this key belief about the change message was perceived differently by the PD facilitators and school principals. In particular, one school principal was able to connect the suitability of PjBL to the vision of her school: "We want our students to be creative and rely on themselves. The project will give the students the tools to look for information and have knowledge that will stick in their mind" (School Principal N). With a more comprehensive perspective of the change initiative, one PD facilitator described an ongoing curriculum revision initiative that aimed to integrate twenty-first-century skills and student-centered learning as essential components. The introduction of PjBL, therefore, was considered a logical next step, "as many of these skills are involved or included in PjBL" (PD facilitator F).

Despite their belief in the appropriateness of PjBL, the PD facilitators and principals reported knowing little about the way teachers approached PjBL, or whether they similarly believed in its appropriateness in the elementary classroom.

Self-efficacy

Having limited understanding of what PjBL actually looked like inside the classroom resulted in missed opportunities for enactive mastery, and consequently resulted in low levels of self-efficacy beliefs, as reported by the majority of interviewed teachers. As one teacher commented:

> I have no idea, and even now when I have a class, I'm still confused… I don't really know if what I've done so far is correct or not…it's a very real mess. (Teacher M).

PD facilitators and principals also reflected the importance of both enactive mastery and vicarious learning experiences. For one, PD facilitators were aware of the fact that teachers lacked the opportunity to observe others who could model the implementation of PjBL in real classroom settings. They believed that such vicarious learning experiences could have enhanced teachers' confidence in their abilities. For instance, one PD facilitator described the necessity of such modeling:

> Teachers should see models, they should arrange visits to other schools and people who are implementing it correctly so they can have a model. It should be part of the school strategy plan. (PD Facilitator A)

PD facilitators were further concerned with the limited experience that teachers had with PjBL. Accordingly, such mastery experiences would prepare the ground for changed perspectives towards the required change to PjBL, as one PD facilitator commented:

> Teachers tend to teach in the way they have been taught. PjBL is a new model and they have not experienced that model, it is going to take a lot of time to change their beliefs. (PD Facilitator H)

On a positive note, four teachers (R, F, B, and C) from the same school claimed to have higher self-efficacy beliefs, which they attributed to the opportunity to work in a collaborative environment. Their ability to "learn from each other and find a solution together" gave them the confidence that they were able to get through this change to PjBL, despite limited understanding of what PjBL truly meant.

Personal valence

In terms of the personal valence component of the change message, participants disagreed on whether such a change would benefit teachers and students in Qatar. Despite having received limited information on PjBL, more than half of the interviewed teachers showed generally positive attitude concerning the way PjBL may be useful to help their students better learn English. These teachers indicated positive outcomes on student motivation and engagement in the learning process. They further depicted a positive shift in their roles from lecturers to facilitators, guides, and coaches. One teacher commented:

> By looking at the papers about PjBL we have received from MOEHE, it seems to be something that can lead to good English skills for our students. (Teacher D)

Positive benefits were further noted by all the school principals, specifically when challenges are transformed into opportunities. One principal noted:

> Since it is a policy from the MOEHE which means we have to do it, why don't we take the challenge and transform it into something good to our school, teachers and students. (Principal D)

A few other teachers had negative perceptions towards the benefits of introducing yet another change into their already existing workload. Additionally, some teachers and PD facilitators believed the approach was "very difficult" for students. As one teacher commented:

> I modified the PjBL because it's very difficult for our students, especially they are second language learners, and my students are very low in the English language, it's not helpful for them …and they're not enthusiastic with the idea because it's difficult for them. (Teacher A)

A PD facilitator's further comments confirmed these observations concerning teachers' concerns:

> The students are not able even to write a sentence, how they can conduct a research? They have many ideas and they are really active to do this, but in Arabic not in English. And also not before grade 6. Then they will have a background at least for English language and they can form ideas, they can write and express their feeling and the other opinion into words. (PD Facilitator Z)

Principal support

A final factor of particular influence on teachers' readiness for implementing PjBL was the principal support component of the change message. The principal support could be distinguished on two levels: the first level concerns the support (or lack thereof) from the MOEHE, and the second level relates to the kind of support received from administrators at the schools.

At the first level, a lack of organizational support at the level of the MOEHE was evident in the interview data. All participants, including PD facilitators, principals, and teachers, expressed clear skepticism towards the tendency of the MOEHE to mandate new policies without careful consideration of their opinions and attitudes towards the change. Previous initiatives were described as fads that were imposed upon the schools for some time, only to be replaced with other temporary change interventions. As one principal noted:

> The Ministry just throw it to the schools and ask to implement it... And in this way education will not improve because the teachers don't know what to do. (Principal T)

At the second level of school administrators, principal support could be categorized into three groups based on the level of support received. From high to low levels of support, the three categories are as follows:

Category 1: As a team, four teachers (R, F, B, C) from the same school tried to find a balance between the requirements of the change mandated by the MOEHE and a focus on the expected benefits of PjBL on student learning and motivation. Principals in this category offered a supportive environment for the implementation of PjBL by encouraging teachers to collaborate on designing projects, sharing resources, and reflecting together for further improvement. Teachers were also able to develop ideas without fearing failure or negative judgment. Consequently, teachers at such schools expressed confidence in managing the implementation of PjBL and transforming any challenges into benefits. As explained by one teacher:

> I work in a good team and we support each other, so although we still have confusion, PjBL has been a good experience in our school. (Teacher F)

Teacher R confirmed the importance of a supportive school principal for implementing PjBL "appropriately," as she commented:

> In our school we want to do things interestingly and make it work. Our principal supported it... So we have the space to do things correctly. (Teacher R)

Category 2: In most of the schools, as mentioned by participants in this study, the principals mainly passed on information and news from the MOEHE. Teachers were asked to do things by following MOEHE instruction without challenging the appropriateness. They tried hard to do what was requested from the MOEHE, despite confusion and fear of failure. The teachers had no clear idea of what PjBL was or

how it should be implemented appropriately. The subject coordinators, as horizontal change agents, were not supportive of the teachers, as they avoided giving any specific directions. Each teacher had to find her own way to survive. As one teacher explained:

> We should plan together but did not, we did not share. Each teacher work with her classes… I did not meet the other teacher. (Teacher E)

Category 3: The school principal gave little attention to new teaching methods and teacher development. Teachers struggled with every aspect of the change initiative, which created tension among them. Teachers were struggling with limited resources and faced negative competition. During the PjBL classes, they felt incompetent and feared being evaluated by their school principals. The subject coordinators were even more "lost" than the teachers, and "didn't know what to do." There was a clear lack of collaboration and peer support, yet a lot of confusion and frustration from the extra workload. In particular, teacher S mentioned being regarded as "troublesome" and "incapable of teaching" when she requested support from the school principal.

Challenges Hindering Teachers' Readiness

Participants discussed several factors that challenged their readiness for change to PjBL. Using a thematic analysis of all data sources, these challenges were grouped into four categories including: absence of participation in decision-making, inefficient (persuasive) communication, insufficient training and development, and lack of system support.

Absence of participation in decision-making

For one, teachers' participation in the initial decision-making was not evident in the way the PjBL initiative was rolled out. Having absolutely no say in the decision-making process, teachers were "suddenly" confronted with the magnitude of the change requirements all at one time. Furthermore, as a top-down change strategy, teachers, PD facilitators, and school principals believed that a lack of clear vision, ineffective communication, and the absence of an initial pilot phase were evident challenges. Teachers believed that they should have been consulted, through surveys or meetings, before "ordering" them to comply without prior preparation. As a result, inefficient communication influenced teachers' ability to understand the need for change, as well as its valence. One teacher revealed:

> We did not get the idea of PjBL and why they are applying it in Qatar schools nowadays, without even giving us a previous announcement about it in the previous year, they apply it immediately. (Teacher D)

Inefficient (persuasive) communication

Another teacher's comment emphasized the importance of sustained communication, even after the change was mandated. One teacher's comment explained this importance:

> We really need someone to come and ask what happened, and we tell them every challenge that we face. They have to give us clear guidelines. (Teacher S)

Insufficient training and development

Additionally, the majority of participants voiced their concern about the shortage in training and development opportunities, which could have contributed to the establishment of a common understanding and need for PjBL. A two-day workshop facilitated by invited speakers from outside of Qatar was not considered sufficient, especially since not all teachers attended the workshop, and those who did were further obliged to train the other teachers in their department. Two of the 11 interviewed teachers had attended the workshop, and they found it highly "informative" and "condensed." However, they also found it challenging to learn about PjBL within the duration of a two-day workshop. At the end of the workshop, they were uncertain about their knowledge, as one teacher recalled:

> The workshop was very useful but so informative that I hardly had time to digest due to the pressure of time limit—you know we had to learn all about PjBL within these two days and go home to train our colleagues before we all have to implement it in class. (Teacher R)

The situation was more challenging for the teachers who had not attended the workshop. These teacher participants perceived the training to be inadequate and unsatisfactory. One teacher commented:

> We did not attend any training for the PjBL, they provide a workshop but only one teacher went there and she transferred the experience to us, the other teachers. The person may get the inaccurate idea, and they can't transfer the idea, it's not the same. So we did not get the term. (Teacher D)

Lack of system support

A fourth obstacle identified by the majority of participants was related to the overall system. All teacher participants explained the constraints they experienced as a result of the additional responsibilities of PjBL. Most teachers agreed that the introduction of PjBL caused an additional workload to their already busy schedules and obligations towards regular curriculum standards, as well as several other school activities. As a result, teachers struggled with time constraints and considered PjBL as an "extra workload." As one teacher exclaimed:

> They want us to implement PjBL, to have story test, to make remedial work, and want to make clubs in addition to the curriculum… It's too much! (Teacher S)

The PD facilitators and school principals agreed with the teachers that each educational change initiated by the MOEHE added a heavy workload and an unstable educational system.

In addition, the teachers noted feelings of confusion and uncertainty regarding the accuracy of their work after their initial planning and trial of the PjBL lesson. They believed in the importance of feedback in consolidating their understanding of PjBL, or perhaps the need for a different perspective. For example, one teacher commented:

> We don't get the feedbacks, we don't know, do we have a success or we failed preparing for the project? They don't mention to us… I wish even from email, send us feedback so we can know. (Teacher S)

The PD facilitators also agreed on the importance of providing feedback. However, they explained that being responsible for too many schools hindered their ability to provide timely feedback to all the teachers at once. This PD facilitator explained this challenge as follows:

> We are trying our best with teachers to give them what we have. To guide them to the right track about the best way to implement this approach and how it benefits students learning, but we are responsible for more than 17 schools and can't be there at one time. (PD Facilitator R)

Discussion

The current study investigated the readiness of teachers towards implementing PjBL as an educational innovation, mandated by a top-down policy at the national level. PjBL was introduced to Qatari government primary schools because it was considered an effective method to bridge the gap between the current status of students' abilities and societal demands for twenty-first-century skills (Ravitz, Hixson, English & Mergendoller, 2012). Nevertheless, despite good intentions, the change message was not successfully communicated to the change recipients, i.e., teachers. Following the change readiness model (Armenakis & Harris, 2009; Armeakis, Harris & Mossholder, 1993; Holt & Vardaman, 2013; Walker, Armenakis & Bernerth, 2007), the examination of the five key beliefs provided a useful lens for describing the change initiative, while identifying the challenges faced by stakeholders and revealing the contextually embedded factors requiring further attention. Based on integrated data from interviews, classroom observations, and lesson plan analysis, the study observed a lack of readiness of teachers to implement PjBL in EFL primary classrooms, from the perspectives of teachers, PD facilitators, and school principals.

Teachers in the current study reported a serious lack of understanding of and skills for PjBL and consequently a lack of confidence to implement PjBL. This result echoes findings of a previous study on implementing a PBL method by mathematics primary teachers during the initial stages of implementation (Al Said, Du, ALKhatib, Romanowski & Barham, 2019). While other studies have revealed teachers' understanding of either PjBL or PBL during initial stages of implementation (Ertmer & Simons, 2006; Tamin & Grant, 2013; Thomas, 2000), it may be particularly the situation for teachers in the given context in Qatar due to the general lack of prior experience related to student-centered learning (Al Said, Du, ALKhatib, Romanowski & Barham, 2019).

The current study also revealed the intricate relationship among the five beliefs of the change message, and the way they interacted to influence teachers' readiness for change. Teachers' lack of understanding of PjBL served as a reason for other difficulties encountered, such as teachers' inability to recognize the appropriateness of PjBL for EFL learning specifically (Stoller, 2006), as well as for teaching and learning generally, as reported by previous studies (Dole, Bloom & Doss, 2017; Duke, Halvorsen, & Strachan, 2016; Jerzembek & Murphy, 2013; Merritt, Lee, Rillero, & Kinach, 2017). Teachers' acknowledgement and appreciation of the benefits of PjBL or PBL may occur after they are able to successfully implement it (Al Said, Du, ALKhatib, Romanowski & Barham, 2019; Dole, Bloom, & Doss, 2017; Du, Chaaban, & AlMabrd, 2019).

The results further revealed the important role of system support from the MOEHE and school principals in the development of such beliefs. Teachers from a supportive school environment reported positive attitudes and perceptions of valence. Thus, the presence of external support that encourages teacher autonomy and collaboration can help create individual readiness, as mediated through the beliefs of discrepancy, appropriateness, self-efficacy, and valence (Holt & Vardaman, 2013; Vakola, 2013; Walker, Armenakis, & Bernerth, 2007).

Several challenges pertaining to the three integrated factors of content, process, and context were identified that may have influenced this lack of readiness at the initial stage of implementation (Armenakis & Harris, 2009; Bliss & Wanless, 2018; Walker, Armenakis & Bernerth, 2007). Regarding the factor of content, teachers were not provided with opportunities to develop deep understanding of PjBL and confidence in their abilities to implement it as an appropriate and valuable change. Consequently, this factor remained a primary obstacle hindering further progress towards effective

implementation. Further, the findings of the current study revealed that teachers' persistence in an educational innovation may not only be influenced by personal factors, but also by factors of change process and context.

Structural factors at an organizational level (Vakola, 2013) generated challenges for the teachers' readiness to change due to the lack of teacher involvement in the change decision, inefficient communication of the change message (Kolmos, 2012), lack of training and development (Rico & Ertmer, 2015), and the lack of recognition of teachers' efforts (Kotter & Cohen, 2002). In particular, in a top-down model of change to PjBL, the choice of relying on selected teachers to learn and train other non-English native speakers on how to implement PjBL raises concern on the approach to change. To facilitate success of a systemic level of change, it is highly recommended to adopt a strategy that involves all stakeholders and provide the needed knowledge, skills, and facilities before the change is initiated (Adelman & Taylor, 2007; Fullan, 2007, 2014; Lam, Cheng, & Choy, 2010). In addition, school contextual factors, such as the availability of physical facilities, PD opportunities, space for autonomy, and a collaborative community, play an influential role on individual readiness for change, which in turn influences the success of institutional change (Bouhuijs, 2011; Danışman, 2010; Fullan, 2007; Lam, Cheng, & Choy, 2010).

Furthermore, the study suggests that empathetic leadership and school support have a crucial impact on teachers' readiness for change (Bouhuijs, 2011; Moesby, 2004). The differences reported by teachers from different schools in this study suggest that school leaders as change agents may facilitate teachers' readiness at individual and group levels. Teacher participants in this study from a supportive school environment demonstrated more positive attitudes to change and commitment to overcoming challenges during the change process. Principals have been found to contribute to shared beliefs and common goals. Thus, teachers benefit from collaborative commitment, efficacy, and trust (Danışman, 2010; Holt & Vardaman, 2013) and share responsibility for developing student learning outcomes (Fullan, 2007, 2014). On the other hand, those teachers who reported a lack of school support reported confusion, frustration, and job dissatisfaction, which echoed results from previous studies (Adelman & Taylor, 2007; Chaaban & Du, 2017; Lam, Cheng & Choy, 2010).

Yet these challenges may be provisional due to the initial stage of the change. It is suggested (Bliss & Wanless, 2018) that low levels of readiness of teachers at initial phases should not be "viewed negatively or treated in a punitive manner" (p. 289); instead, the results should be used to promote constructive solutions within school contexts. To better support teachers' readiness for long-term success of PjBL implementation in Qatar, change agents should address the development of five key beliefs among recipients, namely discrepancy, appropriateness, efficacy, valence, and principal support. The following recommendations are provided based on the findings of the current study.

Firstly, there is a need for direct communication with teachers to ensure their understanding of the change message (Sabah & Du, 2018; Walker, Armenakis, & Bernerth, 2007), including the need for the change to PjBL and its appropriateness and benefits for teachers and students. Teachers' feelings of urgency are the first intuitive motivations for change (Bliss & Wanless, 2018; Fullan, 2014; Moesby, 2004; Rico & Ertmer, 2015). Secondly, involving teachers in the decision-making process is a useful strategy for generating motivation and feelings of ownership among teachers (Kotter & Cohen, 2002). In particular, in a top-down approach to change, it will be a motivating strategy to involve teachers in deciding the teaching designs, topics, materials, and assessment methods (Kolmos, 2012; Sabah & Du, 2018). Further active participation strategies, such as enactive mastery and vicarious learning, remain a necessity for the next level of implementation. Teachers' autonomy and ability to work as change agents are also essential for them to implement change (Bliss & Wanless, 2018; Bouckenooghe, 2010; Bouhuijs, 2011; Fullan, 2014).

Thirdly, following all participants' suggestions and recommendations, teachers should be provided sufficient PD activities that will present them with the relevant knowledge and skills (Bouhuijs, 2011; Fullan, 2014; Kolmos, Du, Dahms & Qvist, 2008). Teachers need deep understanding of PjBL through experiences as learners and constant feedback so that they can become true believers and implementers (Sabah & Du, 2018). Furthermore, an integrative approach of balancing the expertise of external consultants with the experiences and reflections of internal experts can meet the needs of the change targets (Kolmos, Du, Dahms & Qvist, 2008). While it is inspiring to bring in the input of external experts, it is equally important to involve the teachers themselves to reflect on how the transferred models may work in the local context in order to maximize the effect on student learning (Al Said, Du, ALKhatib, Romanowski & Barham, 2019, Du, Chaaban, & AlMabrd, 2019). Adapting PjBL principles to the context of local schools and national culture, as well as taking into consideration the characteristics of students and teachers, is vital for long-term implementation (Danışman, 2010; Du, Ebead, Sabah, Ma & Naji, 2019; Sabah & Du, 2018). Further studies can provide in-depth insights on how teachers experience their first PjBL practices and reveal the contributing and constraining factors in the implementation process.

Conclusion

In summary, the study provided evidence for the change readiness model with empirical work from educational settings in the Qatari context. It also contributed to the PjBL literature and change readiness literature with a case study from primary education, in particular, in a top-town system change mode. Outcomes of the study may provide inspiration for educational change to PjBL in other Arab countries and beyond, and inspiration for sustainable educational innovation and change beyond PjBL. Nevertheless, the study has a few limitations. Firstly, the analytical framework is inspired by literature from the field of organizational change management, while the present study is embedded in a state-wide approach to educational reform in Qatar. Although the interpretation of the data against the selected theoretical framework proved to be useful, there may be aspects that were neglected. Further studies, both qualitative and quantitative, are needed to examine the operational definition of the concept of teacher readiness to change. Secondly, although the majority of change readiness studies use quantitative research designs, the current study employed a qualitative approach with the purpose of exploring deep understanding of teachers' experiences and opinions at an initial stage of change. Nevertheless, the findings are limited to the small number of participants and generalization may be restricted. Thirdly, the study was conducted at the very initial stage of introducing PjBL to Qatari primary classrooms; as such, predicting future implementation may be contingent upon several factors unforeseen in the current study. To better understand the implementation and development of PjBL beyond initial readiness for change among stakeholders, further research on PjBL practice and outcomes involving the different perspectives of teachers, students, and administrators is needed.

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