PBL Project Reflection: Challenges in Communicating Change

Norhafezah, Y[*]., Rosna, A.H., Hasniza, N., Fauziah, A.R., Sarimah, S.A. and Wan Zalina, W.D.

College of Arts and Sciences,
Faculty of Communication and Modern Languages Building,
Universiti Utara Malaysia, 06010 Kedah, Malaysia
Email: norhafezah@uum.edu.my

ABSTRACT

The objective of this paper is to discuss challenges of implementing a Project Based Learning (PBL) approach at three selected schools in one of the northern states in Malaysia. For this purpose, semi-structured interviewing and observation methods were employed. The data were analyzed based on the Five Sentiments Approach (Armenakis, Harris, Cole, Lawrence & Self, 2007a). The findings revealed that there was a high resistance from the teachers and students towards change due to the blatant exam-oriented culture which was still practiced in Malaysian educational institutions.

Keywords: Change, communication, PBL, qualitative

INTRODUCTION

This article was the result of the researchers' interests and on-going work in developing a new pedagogical method in the Malaysian educational setting. The main aim was to discover the challenges of implementing a Project Based Learning (henceforth PBL) approach at three selected schools in one of the northern states in Malaysia[1]. More specifically, the objective of this paper was to discover and understand the challenges in introducing change in educational institutions using the Five Sentiments Approach, as mentioned in the Kurt Lewin's theory (Armenakis, Harris, Cole, Lawrence & Self, 2007a).

Before we proceed any further, it is important to point out at this juncture that this paper reflects largely the principal author's professional perspectives. This paper is the result of the first author's experiences in conducting an intervention study, and she

has adopted a different perspective compared to other researchers in this area of study in understanding the challenges anticipated when change is introduced in the classroom setting.

WHAT IS PBL?

PBL is a mode of teaching using a practical technique which is based on constructivism principles (Savin-Baden, 2000). The European psychologists Jean Piaget (1977) and Lev Vygotsky (1978) were instrumental in developing the concept of constructivism on which much of contemporary problem-based instruction rests. Piaget claimed that children are intrinsically curious and they are constantly striving to understand the world around them. Lev Vygotsky shared a similar idea with Piaget; he believed that intellect develops as individuals confront new and puzzling experience and as they strive to resolve discrepancies posed by

these experiences. Drawing from both the experts' understanding on constructivism, students' are intrinsically motivated to learn if the learning environment supports the learning objectives. Problem based learning is one of the approaches which celebrates constructivism approach. It is a student-centred learning where formative assessment and learning outcomes drive learning (Buck Institute for Education, 2006).

The fundamental assumption of constructivism is that knowledge is co-constructed based on individuals' prior knowledge and their interaction with the environment. From the constructivist perspective, PBL advocates gradual knowledge co-construction in individuals. This view is in line with the idea that the role of a teacher is to facilitate and provide guidance, rather than to provide knowledge. Savery & Duffy (1995) discuss three primary constructivist principles embedded in PBL: (1) understanding comes from our interactions with our environment, (2) cognitive conflict stimulates learning, and (3) knowledge evolves through social negotiation and evaluation of the viability of individual understandings. This process of interaction and negotiation that is embedded in PBL is consistent with constructivism.

PBL was first introduced in the medical school at the University of McMaster to assist medical students to think creatively on issues related to the medical field (Barrows & Tamblyn, 1980). This particular approach propagates active learning which enables the teachers to empower the learners (students) with skills needed to succeed in their future career. PBL can be characterized as an inquiry-based approach, using real-world problem solving and cooperative learning strategies, with a focus on content depth rather than breadth, where teachers are seen as facilitators of learning rather than deliverers of information (Moreno, 1999). Meanwhile, proponents of PBL (e.g., Savery & Duffy, 2001; Savin-Baden, 2000) believe that PBL is one of the best alternatives in response to the challenges facing the 21st century workforce. The challenges include building teamwork,

enhancing leadership, and empowering creative thinking skills (Silva, 2008).

PBL encourages critical thinking, where learners have to critically generate and evaluate possible solutions to problems. They also have to creatively research and gather information, and develop their teamwork competence through frequent consultations and debriefing sessions. Thus, PBL emphasizes on the collaborative construction of knowledge, problem-solving, and transformation of traditional student and teacher roles (Hmelo-Silver, 2004; Dochy, Seger, Bossche & Gijbels, 2003). All these processes are powerful means to develop higher-order thinking skills and self-regulated learners expected of the 21st century workforce (Silva, 2008). Studies on the implementation of PBL in various educational settings support the fact that it develops critical, independent and highly motivated learners, traits which are vital for their future careers (Hmelo-Silver, 2004; Dochy *et al.*, 2003; Silva, 2008).

Drawing from these positive outlooks of PBL, as a powerful method to transform the mind of the learners, this article describes the use of Kurt Lewin's theory of change framework to interpret the first PBL mini project carried out at three selected schools in one of the northern states in Malaysia.

RESEARCH OBJECTIVE

The objective of this study was to investigate the challenges faced by the teachers, as a result of the PBL implementation in the classroom settings. The Five Sentiment Approach (Armenakis *et al.*, 2007a) was employed to analyze the data. The study aimed to answer the following questions: 1) What are the challenges faced by the teachers? and 2) How can the Five Sentiment Approach be used to explain the challenges in the context of communicating change?

RESEARCH BACKGROUND: THE FIRST PBL MINI PROJECT

This PBL project was modelled after the PBL projects carried out in the Buck Institute for

Education, California, or reputably known as BIE. The BIE is a non-profit, research and development organization dedicated to improving the practice of teaching, and the process of learning. It is an independent educational body that focuses mainly on PBL research and development, and it propagates the usage of PBL in educational settings (Buck Institute for Education, 2006).

In the project, six steps were delineated to facilitate the PBL classroom intermediation process: 1) Begin with the end in mind, 2) Craft the driving question, 3) Plan the assessment, 4) Map the project, 5) Manage the process and 6) Develop assessment rubrics (refer to Appendix A).

On the whole, this PBL project comprised four mini-projects. For the purpose of this article, the principal author has chosen to describe the first mini-project as it has already been completed. The other three mini-projects are still on-going and will be completed by the end of 2010. The first mini-project was different from the other projects due to the component of an external reward attached to it. The project was designed in such a way that the group with the best product would be selected to attend a PBL summit overseas.

The first project was the only project where there was an external reward offered by a non-profit organization, an iOU (note that a fictional name is used to protect the confidential identity of the company). The iOU is a non-governmental body which is actively pursuing and propagating PBL training in the country. The other supporting bodies for this first mini-project were a giant software company, Medof[2] and the State Education Department. The project was completed in five months; it started in October, 2008 and finished in March 2009.

This first PBL mini project was aimed at creating a Safety Map for natural disasters. The students were asked to come out with the most creative and critical plan on how to save lives when disaster struck. They were evaluated on the basis of a written report and the presentation of the project to a panel of judges. The panel of judges comprised of teachers from different schools, the school representative and the researchers.

The primary informants, i.e., the teachers, were given a month to plan and complete the project. As the PBL approach itself is a new mode of teaching for the informants, the researchers felt it was crucial to provide a series of training sessions to equip the teachers with the appropriate skills and knowledge of PBL.

Thus, the project started with the training of the selected teachers from three different schools. In total, fifteen teachers were selected by the respective school management based on the criteria delineated by the researchers.

The three schools had shown different levels of academic performance, based on their students' achievements in the public examinations, namely, the *Peperiksaan Menengah Rendah* (*PMR[3]), Sijil Pelajaran Malaysia (SPM[4])* and *Sijil Tinggi Pelajaran Malaysia* (*STPM[5])*. Based on these levels of academic performance, the schools were categorized as follows; the best school was *Sekolah Mawar* (fictional names are employed to protect the confidential identity of the schools). This was followed by *Sekolah Anggerik* and finally *Sekolah Kenanga*.

This project was started after obtaining the required consent from the State Education Department. Permission from the Ministry of Education, Malaysia was also required before the project was allowed to proceed. When the approval was granted by the Ministry, the researcher team met with the State Education Department representative and with the three principals of the selected schools.

TRAINING SESSION I

The first training session had taken place in the university, where most of the researchers were attached. This workshop was conducted under immense pressure of time due to the need to select the best group from each of the three selected schools for an overseas trip; the reward for implementing the best PBL case study project on the subject Science. The training was conducted from 8 a.m. till 5.30 p.m. It is important to note that a close communication

among the active agents (namely the researchers, the iOU, Medof and the State Education Department) had taken place since October, 2008.

Each group consisted of five teachers. They were three Science teachers, and one each for English and, *Bahasa Malaysia*[6] represented in each school. They were given files containing the Science syllabus, workshop schedule and planning documents. The teachers were also asked to give their contact addresses and mobile phone numbers so that they could be contacted in the near future. They were exposed to the philosophy of PBL and the ideal way of implementing the project in the classroom. The whole session was videotaped.

TRAINING SESSION II

The second workshop was conducted on 13 February 2009. This workshop was attended by 14 teachers, as one teacher had decided to withdraw from the session because he was no longer interested in any of State Education Department sponsored programmes.

The second workshop was conducted by the lead researcher, and she started the session by asking about the progress of the project, issues encountered, and on the general practical aspects regarding the PBL project, especially matters regarding the overseas' trip. This workshop ended on a rather unexpected positive note as it was found that some teachers from each school were active in coordinating the project. This was a rather surprising outcome because, even though it was a completely new method for the teachers, they were still active and enthusiastic in their attempt to implement the PBL project. Moreover, one of the teachers from *Sekolah Anggerik* took the initiative to build a blog. The blog was actively used by the students, teachers, and the principal author. Based on the feedbacks from the workshop session, it was found that the teachers were progressing well in the first mini-project. The teachers from *Sekolah Mawar* had reached step 5[7] in the PBL procedures (workshop data, February 2007). For the teachers in

Sekolah Anggerik, they had moved to step 6 and *Sekolah Kenanga*, the school teachers were at level 5 and moving on to level 6 (workshop data, February 2007).

It is also vital to note here that this PBL project is not directly related to the existing official Science syllabus, which teachers still had to enact during the period of the study. The researchers knew that the teachers involved in the project were conducting the PBL sessions both inside and outside of the classroom setting. Thus, this situation might give rise to an ethical issue; whether these teachers were actually aware of their rights to participate or withdraw from the PBL project. It was made very clear to the participants that they had the option to withdraw from the PBL project if they thought it was not in line with the Science syllabus.

In order to complete the cycle, the researchers had to visit the three schools to evaluate the students' participation. As this was a pilot project i.e. a new project in this state, only the best class from each school was selected to join the programme. The two criteria used to choose the winner are as follows; 1) oral presentation and 2) final written report. The students were given the proposed evaluation rubrics before each task. Due to financial constraints, the iOU decided that only one group from each class would be selected to represent Malaysia to the overseas summit.

THEORY OF CHANGE

This section specifically discusses Kurt Lewin's theory of change. This theory argues that the change process usually flows in three phases, namely unfreezing, moving and freezing. Lewin's change theory propagates three phases (Burnes, 2004; Medley & Akan, 2008). The first stage is the unfreezing stage. Unfreezing refers to the state of preparing the targeted individuals with mental and physical justification of why change needs to be embraced. The change agents normally provide information and training and keep on persuading the targeted group to accept the change idea at the same time.

The second stage is the moving stage. This is the implementation stage where change is executed. At this stage, most individuals or groups will be busy absorbing the implementation of the change and adjusting themselves to the new working culture. Finally, the third stage is the freezing stage. This stage refers to the state of full acceptance of the targeted individuals of the change. It is assumed that after the unfreezing and moving phases have been accepted and implemented properly, change is fully embraced by the targeted individuals or groups.

Given that most studies attempted to explain the whole cycle of change (Klien, 1996; Sparks, Raats, Geekie, Shepherd, 1996; Varey & Hamblett, 1997), this research only attempted to contribute to the unfreezing literature. Although this approach can be seen as a limitation of the study, it is also the strength, where the researchers tried to provide insights into what actually had happened during the early stages of change (unfreezing phase).

Unfreezing, as suggested by Armenakis & Harris (2009), indicates the readiness to change. The concept of readiness for change is in line with Kurt Lewin's view that change is positive for members in a community or an institution (Armenakis & Harris, 2009). In the early study by Klien (1996), unfreezing is interpreted as 'readying the organization for change' (p.37) which normally involves the first step of introducing new practices and knowledge to the members in an organization. Reflecting on the above definitions, unfreezing refers to the process of identifying why change is needed in the first place. It promotes the idea of transitions, i.e. from the existing state to the future one. Indeed, this readiness to learn a new culture means unlearning, learning, and relearning at one and the same time (Schein, 2006). This means that the people are prepared to understand new issues (structures and tasks), and gradually, the change agent could introduce the change, i.e. the new agenda to the targeted and potential receivers.

In a study on "Surviving organizational change," Nelissen & Selm (2008) suggested that there are six dimensions in the unfreezing process. These dimensions are corporate survival, personal opportunities, positive state of mind, fear tasks, fear atmosphere and lack of confidence. In experiencing these six dimensions, Nellissen & Selm (2008) argued that during the unfreezing stage, individuals would experience positive and negative feelings.

Nonetheless, there are many critics of Kurt Lewin's theory of change. However, according to Burnes (2004) and Schein (2006), the parsimonious principle of the theory in explaining the change cycle has made it a useful theory to explain the change phenomenon in a particular setting.

For instance, in the unfreezing phase, it touches on how communication channels are opened to disseminate change messages to the targeted subjects, which in this case are the teachers. In this phase, the trainers, i.e. the iOU and the researchers attempted to distribute the 'useful' information related to change to the subjects. In line with communicating change, i.e. explaining about the project, the teachers were free to interrupt to exchange ideas, ask questions, express their feelings and argued their view whenever they thought that they needed clarification from the change agents (namely, the iOU representative and the researchers). Documents pertaining to the project were given to each of the participants and several topics in the documents were also discussed. Both the printed documents and the soft copies in power points from the iOU representatives were freely distributed to the participants. Those materials represent the initiative of the reformers to educate, elaborate and argue why this project is pertinent for student development in critical thinking and creative skills. In this stage, trainers and materials act as stimuli to the communication change process. Even though the decision to make the change is up to the participants, this stage represents the first bold attempt of the researchers to persuade the participants to adopt the PBL project for the sake of positive development in future generations.

RESEARCH DESIGN

This study used a qualitative research methodology, with semi-structured interviews and observations, as the main methods utilized in data collection.

THE METHODS

The informants of this study were 15 teachers, three principals, and three State Education representatives. As mentioned above, a total of 15 teachers were involved. Five teachers were selected by the principals for each school. Each group was represented by three science teachers and a senior teacher to supervise the project. In addition, one English teacher and one *Bahasa Malaysia* teacher were included to assist the students in preparing the report and presenting the project. The distribution of gender is seemingly balanced with 7 male teachers and 8 female teachers. For the details of the demographic data, please refer to Appendix B.

In this study, the researchers employed semi-structured interviews and observation. Interviewing took place during the first meeting with the Director's representatives from the State Education Department, the State representative for the Science Cluster, the three principals, and finally the teachers in the different workshops, formal and informal meetings. The interview protocol was guided by Armenakis *et al.*'s (2007a) five fundamental change questions. They are: 1) How would you describe your job?, 2) What are you having successes with and why?, 3) What are you struggling with and why?, 4) What changes do you think need to be made?, 5) Do you have any final comments? In addition, observation was mostly done during the workshop and meeting with the teachers.

Data Validation

Interviews were tape-recorded and in some cases where tape recording was not practical, especially during the early meetings between the teachers and the researchers, all the researchers took notes during the interviews. Right after the interview sessions, the researchers immediately went over their notes of the interviews and wrote down additional observations. The principal author also kept an observation diary to record the challenges encountered in implementing the PBL project in the classrooms. During the whole period of the project, the principal author monitored the interactions in the PBL blog which was initiated by the male teacher from *Sekolah Kenanga*. In this study, the teachers were encouraged and asked to submit their comments to the principal author via email whenever they had doubts during the process of completing the first mini-project.

ANALYSIS STRATEGY

The required data were collected and thematized to focus on the phenomenon of unfreezing, whereby the respondents were prepared to accept change, i.e. from the state of the unknown to the known. Drawing from the data, the principal author identified emerging concepts which were able to explain the change process as the result of the introduction of the PBL approach to the classroom settings. Due to the need to relate the data to a theoretical framework, the principal author chose Kurt's Lewin unfreezing paradigm to explain the observed change process. These concepts could be further explained using the five dimensions suggested by Armenakis *et al.* (2007a). These include discrepancy, appropriateness, efficacy, principal support and valence (Armenakis *et al.*, 2007a, b).

FINDINGS AND DISCUSSIONS: THE CHALLENGES OF INTRODUCING PBL IN SCHOOL

As mentioned before, the data were analyzed using the framework of the five sentiments of change, namely, discrepancy, appropriateness, efficacy, principal support, and valence. Discrepancy refers to the presence of any instances of deviance from the norms of the institution. Appropriateness can be defined as whether the PBL (the change) introduced by the researchers is in line with the institutional

culture or situation (situation based). Meanwhile, efficacy can be described as having confidence in adapting to change. Principal support refers to the support of leaders towards organizational change. In this context, valence refers to what the individual perceives to be his or her benefit or loss as a result of change.

From the principal author's viewpoint, which was based on the earlier meetings with two State Education Department representatives and three principals, the response to introduce the PBL project was positive. Only one principal from *Sekolah Kenanga* was quite hesitant about the project, as she had just been transferred to the school. However, at the end of the first-mini project, she became supportive of the project.

DISCREPANCY

Introducing PBL to the schools is a challenge. At first, the researchers expected low resistance from the schools, especially when we had strong support from the top management at the federal and the state levels.

Arguably, given the nature of the Malaysian community, which most commonly practices the culture of collectivism (Hofstede, 1984; Gudykunst & Lee, 2003), the principal author was expecting positive responses from the respondents. Collectivism is an attribute which characterizes individuals as respectful of authority and confirming to community values (Gudykunst & Lee, 2003). On the other hand, in a different culture such as in the Western context, this process is not certainly uncommon in many change research where organizations usually experience resistance from employees and other stakeholders when change is introduced (Vakola & Wilson, 2004).

In this study, the responses from most of the teachers were rather apprehensive. Majority of the teachers voiced their concerns on the implementation of PBL in their schools. They stated several reasons to justify their thoughts. These include students' readiness to accept the change, parents' expectation in term of grades, and inflexibility of school time-table, especially

for science classes. As stated by a senior Science teacher from *Sekolah Anggerik*:

> *Parents will be keen to know how this project will affect the exam grades. They usually care about the exam grades* (personal communication, February, 2009).

The above mentioned statement, which reflected a rather apprehensive thought, was supported by his colleague in *Sekolah Kenanga* on the issue of inflexibility teaching time-table:

> *I think we have to remember, school time-table is quite inflexible to cater for this project* (personal communication, February, 2009).

The abovementioned reasons are related to the grade conscious culture of the schools. Due to this rather pervasive school ethos, most teachers were reluctant to change to a new teaching method as they would be subject to intense pressure by parents if the children could not achieve good grades in their exams. In other words, for the teachers, the PBL method is against the mainstream pedagogical method which is chalk and talk.

APPROPRIATENESS

The timing of this project is another controversial issue from the perspectives of the recipients, especially among the teachers. As a Science teacher from *Sekolah Kenanga* stressed during an interview:

> *The timing is bad, syllabus problem, exam questions for midterm, parents' expectations, sports events, ceremonial events* (personal communication, February, 2009).

In the above confession, the teacher actually tried to describe to the researchers that what was the most important from the perspective of the principals, parents and students was the students' grades. He further explained that the teachers

were worried that, if by implementing PBL while the students were in the middle of finishing the structured syllabus, this could affect the grades of the students in their mid-term exams. In other words, they were concerned over the implications as a result of their students getting poor grades when using PBL.

Another teacher from *Sekolah Mawar* pointed out that their school had to participate in many ceremonial events which they could not avoid because it was a top-down directive:

> *Next week, we will have royal visit at our place and then there will be other activities taking place. We are just too busy. We ask for deadline extension for the PBL presentation. Maybe on the 2 March and then the chosen students can make their passport on the 3rd March. It will take only a day to prepare their passport* (Workshop data, February, 2009).

The teachers were not only being pressured to produce high achievers in terms of grades but they were also expected to juggle between administrative duties and having a social life. They argued that they came under immense pressure trying to maintain the grades of the students in the top classes as they were afraid that parents would be angry if their children's performance declined. This fear of introducing change is apparent especially with the students in the top classes. This phenomenon is not uncommon in the change literature, as no organization wants to take any unnecessary risks if the outcome will have more negative impact on the recipients (Watters, 2007). Emerging crisis is unwelcome to any organization. Severe crisis must be avoided. As has been documented in the past research, anticipation of crisis is real in most change processes in organizations (Armenakis & Harris, 2009). In fact, some studies even suggested the organizations identify measures to lessen the negative impact of change by providing training, concentrating on leadership capability and strengthening employee-employer relationship (Armenakis *et*

al., 2007a, b). The challenge of introducing PBL in this case is that the top management, on the one hand, feels that it is one of the best methods to provide a comprehensive learning experience to the students. However, the teachers on the other hand, felt pressured to implement this project as they had foreseen difficulties in implementing it due to grade conscious culture of the stakeholders.

EFFICACY

During the early stage of the study, the principal researcher had assumed that the teachers selected for the project generally believed in the PBL. However, when the project had been started for a period of time, it was found that only one Science teacher from *Sekolah Anggerik* was confident in adapting the new concept in his school environment.

He was pursuing his Master in Information Technology and claimed that in the past, he had undertaken a similar kind of project which was sponsored by a giant electronic company in his previous school. Another criterion which reflected his interest in this project was his initiative in creating a PBL blog. The main intention of creating the blog was to assist the students in conducting the PBL project. He indicated that:

> *The purpose of creating the blog is to ease communication among the students so that they know what they need to know. What's more they are involved in sports and by blogging they can contact me at their convenience* (Email interview, February 2009).

Generally, however, it was not easy for most other teachers to adapt to this new style of teaching as they had been comfortable with their existing teaching practices. In light of this argument, it is extremely hard when it comes to top down approach (whereby the principals and the state believe that it is one of the best methods to be adopted), but the teachers feel that it is too burdensome (refers to appropriateness aspect).

Thus, for the first PBL mini-project, we could safely claim that only one school (i.e. *Sekolah Anggerik*) reflected the high confidence level in understanding the project due to the highly motivated teacher, whereas the rest was sceptical in accepting the change.

PRINCIPALS' SUPPORT

The researchers started this project with the hope to develop one exemplary model of the teaching method in secondary rural and urban schools in Malaysia. This is because in the extant literature in PBL, the claim is made that this method has tremendous positive impacts on students learning and their self-development in the future (Mitchell & Smith 2008; Savin-Baden, 2000; Sungur & Tekkaya, 2006). It is arguably one of the most effective methods in learning if it is implemented in the right manner (Dochy *et al.*, 2003; Goodnough, 2006; Mitchell & Smith, 2008). With these positive findings on the PBL approach in various research settings, this study embarked on the journey to find out whether the implementation of the PBL approach in local school setting would also show a similar positive impact on students' experiences in learning.

The principal author and the lead researcher went to meet the State Educational Director representative to seek permission to conduct the research at selected schools and to persuade him to accept the idea of implementing PBL in the school system. He was enthusiastic and showed a positive response towards the project. He pointed out that:

> *Yes, we believe any project such as this will help our state to move forward. We do foresee the problems with the teachers where they will see it as a burden but as it seems our state is geared toward positive cooperation from other institution, we believe that we will try to overcome the challenge. We just need a letter from the Ministry of Education to start the ball rolling* (personal communication, December, 2008).

In addition, the principals from *Sekolah Mawar* and *Sekolah Anggerik* gave their full support from the beginning, while the principal from *Sekolah Kenanga* was a bit resistant as she had just been transferred to the school. There was a formal meeting between the researchers and the school principals before the PBL project was realized. Both the principals from *Sekolah Mawar* and *Sekolah Anggerik* pledged their full support to the project implementation as they believed this project would benefit their students in the long run. However, the principal from *Sekolah Kenanga* was rather hesitant to embrace the change as she was unsure on the culture of accepting change in her new school. Another party, i.e. the Medof an NGO, also contributed a lot to the project. The company had sponsored the workshop session for the first mini PBL project.

VALENCE

Valence refers to what one perceives as benefit or loss when change occurs. At the start of the study, only *Sekolah Anggerik* believed it was beneficial for the students, whereas the teachers of the other two schools (*Sekolah Mawar* and *Sekolah Kenanga*) gave bleak responses to the project stating that they never really wanted to participate due to their work load and parental pressure. During the first workshop, a female teacher expressed the following view:

> *This is their (the university) project. We just do it* (Workshop data, February, 2000).

The issue here is the ownership of the project. Most of the teachers saw the PBL project as the researchers' academic project and they were just a part of it. When the researchers started the project, it was fully supported by the State Education Director, the three principals and the Medof organization. However, when it came to the implementation stage, the school teachers were resistant to the change, and as mentioned earlier, only *Sekolah Anggerik* was positive about the implementation of the project.

What was interestingly observed in this study was the gradual change of the teachers' belief in the PBL project. Initially, only one the male Science teacher from *Sekolah Anggerik* was enthusiastic about the project. Later, another Science teacher from *Sekolah Mawar* gradually started to show interest upon discovering more about the project. In fact, for the third mini-project (which is still in progress), he is the most active informant asking for more advice and support, preparing for the PBL documentation and participating actively in the workshop sessions. According to him, in the first mini-project, he was in a rush to finish the syllabus, and he acknowledged that his lack of knowledge and skills in the PBL approach was a hindrance to his full participation. However, when he had completed the first mini-project, he realized that there was more to learn. His confession intrigued the researchers as he also realized that the other teachers also lack knowledge and skills in implementing PBL, but did not attempt to ask for more input. Thus, the researchers realized that this lack of knowledge and skills when checking the students' diaries and their end products did not seem to be in line with the PBL's rubric expectation.

CONCLUSION AND IMPLICATIONS

It is undeniably true that communicating change to the target respondents is rather challenging in this research context. This first mini project was completed within a month. Due to the special character of the PBL project (i.e. reward was promised for the successful group), the teachers from the three selected schools worked hard to complete the project. Unfortunately, the trip was postponed to a later date due to the growing threat of the H1N1 pandemic. As a result, the researchers had to face criticisms from the schools and parents. Most of the teachers were unmotivated to continue with the second mini-project. During the meeting to explain the reason of the postponement, the lead researcher asked the teachers to consider withdrawing from the second mini-project if they were no longer

interested in the PBL training. However, none of the teachers accepted the offer and at the time of writing this paper, the Science teachers from the three schools were still undergoing training with the lead researcher for the third mini-project.

In retrospect, in the first mini-project, the researchers' attempt to understand the idea of change and the analysis of the change perspective using the Five Sentiments of Change by Armenakis *et al*. (2007a) revealed that there was a high resistance towards change. Working on this project, the researchers further realized that it would be better if they could monitor the interaction of the respondents at the group level more closely. There is a need to discuss the participants' frustrations more openly and address the issue of how their teaching methods could be improved. What is more important is to ensure that they are really implementing PBL, and not simply accepting the feedback from the project participants that they were faithfully implementing the PBL approach in their classes. We are considering winning over the State Education Director, especially in getting and encouraging more official support to involve teachers as they need to be made aware that they have the support from the top management. The impact of high resistance towards accepting pedagogical change is apparently due to the widespread grade conscious culture in Malaysian educational institutions.

From this study, it can be seen that interpreting the data using the Five Sentiments can help the researchers to understand the change process. Therefore, the prevalence of high resistance from the community of parents and students need to be taken into serious consideration in future research due to the blatant exam-oriented culture being practised in Malaysian educational system.

REFERENCES

Armenakis, A. A., & Harris, S. G. (2009). Reflections: Our journey in organizational change research and practice. *Journal of Change Management*, *9*(2), 127-142.

Armenakis, A. A., Harris, S. G., Cole, M. S., Lawrence, F., & Self, D. R. (2007a). A top management team's reactions to organizational transformation: The diagnostic benefits of five key change sentiments. *Journal of Change Management*, *7*(3), 273-290.

Armenakis, A. A., Bernerth, J. B., Pitts, J. P., & Walker, H. J. (2007b). Organizational change recipients' beliefs scale: Development of an assessment instrument, *Journal of Applied Behavioral Science*, *43*(1), 481-504.

Barrows, H. S., & Tamblyn, R. M. (1980). *Problem-based learning in secondary education and the Problem-based Learning institute (Monograph)*. Springfield: Southern Illinois University School of Medicine

Buck Institute for Education. (2006). Novato, California: BIE.

Burnes, B. (2004). Kurt Lewin and complexity theories: back to the future? *Journal of Change Management*, *4*(4), 309-325.

Dochy, F., Segers, M., Bossche, P. V., & Gijbels, D. (2003). Effects of problem-based learning: A meta-analysis. *Learning and Instruction*, *13*(1), 533-568.

Goodnough, K. (2006). Enhancing pedagogical content knowledge through self-study: An exploration of problem-based learning. *Teaching in Higher Education*, *11*(3), 301-318.

Gudykunst, W. B., & Lee, C. M. (2003). Cross-cultural theories. In W.B. Gudykunst (Ed.), *Cross cultural intercultural communication* (pp. 7-34). Thousand Oaks: Sage.

Hofstede, G. (1984). *Culture's consequences* (Vol. 5) *Cross-cultural research and methodological series*. California: Sage.

Hmelo-Silver, C. E. (2004). Problem-based learning: What do and how do students learn? *Educational Psychology Review*, 235-266

Klien, S. M. (1996). A management communication strategy for change. *Journal of Organizational Change Management*, *9*(2), 32-46.

Medley, B. C., & Akan, O. H. (2008). Creating positive change in community organizations. *Nonprofit Management & Leadership*, *18*(4), 485-496.

Mitchell, J. E., & Smith, J. (2008). Case study of the introduction of problem-based learning in electronic engineering. *International Journal of Electrical Engineering Education*, *45*(2), 131-143.

Moreno, N. P. (1999). K-12 Science education reform: A primer for scientists. *Bioscience*, *49*(7), 569-576.

Nelissen, P., & Selm, M. V. (2008). Surviving organizational change: How management communication helps balance mixed feelings. *Corporate Communications: An International Journal*, *13*(3), 306-318.

Piaget, J. (1977). *Equilibration of cognitive structures*. New York: Viking.

Savery, J. R., & Duffy, T. M. (1995). Problem based learning: An instructional model and its constructivist framework. *Educational Technology*, *35*(5), 135-148.

Savery, J. R., & Duffy, T. M. (2001). *Problem-based learning: An instructional model and its constructivist framework.* CLRT Technical Report 16-01. Bloomington, IN: Indiana University Center for Research on Learning and Technology.

Savin-Baden, M. (2000). *Problem-based learning in higher education: Untold stories*. The Society for Research into Higher Education and Open University Press: Buckingham.

Schein, E. H. (2006). *Kurt Lewin's change theory in the field and in the classroom: Notes toward a model of managed learning.* Retrieved August 31, 2008 from http:// www.a2zpsychology.com

Silva, E. (November, 2008). Measuring skills for 21st century. Education Sector Reports, p.1-11. Washington: Education Sector. Retrieved October 18, 2008, from http:// www.educationsector.org.

Sparks, P., Raats, M. M., Geekie, M. A., Shepherd, R., & Dale, C. (1996). Communication strategies for the effective promotion of dietary change. *Nutrition & Food Science*, *5*(1), 52-55.

Sungur, S., & Tekkaya, C. (2006). Effects of problem-based learning and traditional instruction on self-regulated learning. *The Journal of Educational Research*, *99*(5), 307-317.

Norhafezah, Y., Rosna, A.H., Hasniza, N., Fauziah, A.R., Sarimah, S.A. and Wan Zalina, W.D.

Vakola, M., & Wilson, I. E. (2004). The challenge of virtual organization: Critical success factors in dealing with constant change. *Team Management Performance*, *10*(5/6), 112-120.

Varey, R. J., & Hamblett, R. L. (1997). Business excellence review at Royal Mail (NW/NW): A case of strategic communication management, *Managing Service Quality*, *7*(6), 281-289.

Vygotsky, L. S. (1978). *Mind in society*. Cambridge: Harvard University Press.

Watters, J. J. (2007, October 29-31). Problem based learning in pre-service elementary science teacher education: Hostile territory. *Proceedings of the PBL Conference on Problem-Based Learning in Undergraduate and Professional Education*. Birmingham, Alabama, 1-10. Retrieved October 15, 2008, from http://www.eprints.qut.edu.au

ENDNOTES

[1] Located in the north of Peninsula Malaysia (Economic Planning Unit, 2008).

[2] A fictional name is used to protect the confidential identity of the company

[3] PMR stands for Penilaian Menengah Rendah (Lower Secondary Assessment)

[4] SPM refers to the Sijil Pelajaran Malaysia (Malaysian Education Certificate)

[5] STPM stands for the Sijil Tinggi Pelajaran Malaysia (Malaysian Higher Education Certificate)

[6] Bahasa Melayu is the national language. It is best translated as the Malay language.

[7] Please refer to Appendix A

APPENDIX A

The PBL Process

Cycle	Process	Notes
1	**Begin with the end in mind**	Summarize the theme or "big ideas" for this project. Identify the academic outcomes that students will learn in this project (2 – 3 per subject) Identify key skills students will learn in this project. List only those skills you plan to assess (2 – 4 per project).

2	**Craft the driving question**
	Students are confronted with a problem & they are free to discuss with group members prior to class discussion.
	Step 1: Framing of the problem. As a class/group, draft an initial problem statement using the formula: "How can we as ? do ? so that ?"
	Step 2: Knowledge inventory: "Knows" "What do we need to know?"
	Step 3: "What do we (already) know?"
	Step 4: "What do we need to know now?"
		Divide students into small teams of 2 to 4 to organize ideas and to define the problem.
		Give them 5-10 minutes to read and discuss the 'entry document'
		Guide students to create the 'Driving Question'
		Engage students in a dialogue to generate the following lists:
		  NEED TO KNOW
		  ALREADY KNOW
		  NEED TO KNOW NOW

3	**Plan the assessment** Carefully plan the assessment to ensure learning outcomes are met	Step 1: Define the products and artifacts for the project. Step 2: State the criteria for exemplary performance for each product.
4	**Map the project** Look at one major product for the project and analyze the tasks necessary to produce a high-quality product. Analyze the knowledge and skills needed	Do the products and tasks give all students the opportunity to demonstrate what they have learned? What do students need to know and be able to do to complete the tasks successfully? How and when will they learn the necessary knowledge and skills?
5	**Manage the process**	How will you and your students evaluate the project? Examples: class discussion, fishbowl, student-facilitated formal debrief, teacher-led formal debrief, individual evaluations, group evaluations, etc.
6	**Develop assessment rubric**	Identify the types of assessment Examples: essay, presentation and report

APPENDIX B

Demographic Data

Sekolah Mawar

No	Teacher (Subject expertise)	Age	Gender	Highest Academic Qualifications	Teaching experience	Ethnicity
1	Science	50s	Female	Bachelor Degree	> 28 years	Malay
2	Science	40s	Male	Bachelor Degree	>12 years	Malay
3	Science	30s	Male	Bachelor Degree	> 7 years	Malay
4	English	30s	Female	Bachelor Degree	>10 years	Malay
5	Malay Language (Bahasa Malaysia)	40s	Female	Bachelor Degree	>20 years	Malay

Sekolah Anggerik

No	Teacher (Subject expertise)	Age	Gender	Highest Academic Qualifications	Teaching experience	Ethnicity
1	Science	50s	Male	Bachelor Degree	> 28 years	Chinese
2	Science	40s	Male	Bachelor Degree	> 12 years	Malay
3	Science	40s	Female	Diploma	> 15 years	Malay
4	English	40s	Female	Masters	> 14 years	Chinese
5	Malay Language (Bahasa Malaysia)	40s	Male	Bachelor Degree	> 23 years	Malay

Sekolah Kenanga

No	Teacher (Subject expertise)	Age	Gender	Highest Academic Qualifications	Teaching experience	Ethnicity
1	Science	30s	Female	Bachelor Degree	> 10 years	Malay
2	Science	50s	Male	Bachelor Degree	> 17 years	Malay
3	Science	30s	Male	Bachelor Degree	> 10 years	Malay
4	English	40s	Female	Masters	>20 years	Chinese
5	Malay Language (Bahasa Malaysia)	30s	Female	Diploma	>25 years	Malay