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Factors that inhibit science teachers' implementation of learner autonomy after a professional development collaboration

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Developing learner autonomy can improve learners' outcomes. Teaching students autonomy is a cultural endeavour. Therefore teachers operating from an Asian heritage may struggle to implement learner autonomy. Teachers face several pressures when implementing learner autonomy, and require development. This paper investigates what prevented science teachers from implementing autonomy-supportive strategies after a Collaborative Professional Development Programme (CPDP). CPDP guides science teachers to implement learner autonomy, with Assessment for Learning (AfL) principles. It flexibly and expertly encourages teachers to strategise their autonomy. This study is part of a more extensive study. Three primary science teachers participated in the CPDP. They were interviewed afterwards to elicit inhibiting factors, which included lack of time to prepare students for examinations and resources (pressure from above); non-cooperative students (pressure from below) and teachers' beliefs that students were unable to become autonomous (pressure from within). Detailed recommendations are given, with implications for professional programme developers and policymakers.

Key words: *Learner Autonomy, Science Teachers, Professional Development Programmes, Assessment for Learning.*

Introduction

Take any contemporary learning theory such as constructivism, self-regulated learning or principles of Assessment for Learning (AfL), and all require students to take more responsibility for their learning and to be autonomous learners (Liu, 2015; Willis, 2011). Developing learner autonomy has the potential to improve students' academic achievement, increase motivation, take an active role in learning, and become lifelong learners (Ounis, 2016; Zimmerman & Schunk, 2011). However, the decision to incorporate autonomy-supportive strategies in classrooms lies solely with teachers (Assor, Kaplan & Roth, 2002). Research suggests that learner autonomy is a psychological phenomenon but teaching students to be autonomous is a cultural endeavour (Benson, 1997; Dang, 2010). Teachers operating in a high-stakes examination context or Asian heritage may struggle to implement autonomy-supportive strategies (Lengkanawati, 2017). These teachers need guidance to shape and develop strategies to foster students' active participation that would eventually lead to learner autonomy (Holec, 1985).

Teachers are reluctant to promote learner autonomy because they believe they play the role of primary knowledge-providers (Alonazi, 2017; Nakata, 2011). Thus, they prefer to endorse teaching strategies that encourage the top-down transmission of knowledge and implement pedagogies like 'chalk-and-talk'. Moreover, many inherent factors like class size, school culture, and demands placed by stakeholders distort teacher intentions to implement learner autonomy (Pham & Renshaw, 2013; Sanchita, Swain & Mishra 2017). Student passivity and disengagement in classroom tasks that require active participation tend to encourage teachers to revert to more traditional teaching styles.

Therefore, it is crucial for teachers operating in an Asian heritage culture to be exposed to effective models of professional development programmes, to ensure that learner autonomy is successfully implemented. Due to the complexity of the concept of learner autonomy, not all teacher development programmes have succeeded. There are wide ranges of outcomes for these professional development programmes. Therefore the quality of the professional development programmes has to be investigated, so that inhibitors can be identified and improvements made.

This paper aims to investigate what has prevented primary science teachers from successfully implementing autonomy-supportive strategies, after a Collaborative Professional Development Programme (CPDP). The CPDP was designed to support primary school science teachers and guide them to implement learner autonomy. The concept of learner autonomy was chosen as it aligned with the introduction of school-based assessment in the Malaysian primary school system, and AfL principles underpinned this assessment. The heart of AfL is learner autonomy (Swaffield, 2011; Schott, 2017). CPDP is flexible and long term.

It also invites the active participation of teachers, and it provides expert support and guidance as teachers attempt autonomy-supporting strategies. Therefore, it is imperative to assess the outcomes of the CPDP programme, and to identify inhibitors in science teachers' implementation of learner autonomy. This study is essential as it sheds light on the downfalls of the programme, so that it can be modified to ensure sustainable practices in the future.

Literature Review

Holec (1981) gave one of the earliest definitions of learner autonomy, as the "ability to take charge of one's learning, and to take charge of one's learning is to have, and to hold, the responsibility of all the decisions concerning all aspects of this learning" (p. 3). The concept of learner autonomy is multidimensional, and difficult to define comprehensively (Little, 2015). As learning is a cultural endeavour, Littlewood (1999) identified two different types of autonomy based on the educational context. He segregated Asian learners as having reactive autonomy and Western learners as possessing proactive autonomy. Learners with proactive autonomy see it as an innate ability, whereas learners with reactive autonomy require some guidance as a prerequisite before they can take responsibility for their learning. As such, Asian teachers planning to implement learner autonomy strategies are faced with more significant challenges (Pham & Renshaw, 2013).

Many Asian countries are reforming their educational assessment system to incorporate the principles of Assessment for Learning (AfL), and the heart of AfL is learner autonomy (Klenowski, 2009; Sathasivam, Samuel, Norjarudden, Tee & Leong, 2019; Swaffield, 2011). Having teachers implement AfL to promote learner autonomy is difficult (Marshall & Drummond, 2006). Reeves (2009) had conceived three levels of pressure that may prevent teachers from implementing learner autonomy. They are 'pressure from above' (e.g. policies, school administrators, parents); 'pressure from below' (e.g. students' listless reaction to activities) and 'pressure from within' (e.g. teacher's beliefs or personal dispositions).

Policies are conceived and delivered as top-down models, but the responsibility for translating these policies into practices lies solely on teachers. Moreover, teachers are still required to adhere to fixed curriculums and prescribed texts. Additionally, external agents like school principals or parents often burden teachers with the responsibility and accountability for students' behaviour and outcomes, thus preventing teachers from implementing learner autonomy. Autonomy-supportive strategies such as providing students with choices and taking in their ideas when making decisions may look simple, but it is too time-consuming, and so the concept of learner autonomy is not valued (Deci & Ryan, 1985).

Teachers also face pressure from below as their students expect them to initiate the learning agenda (Taylor & Parsons, 2011; Satya & Kuraesin 2016). Asian students react passively to

their teachers' invitation to participate in activities such as presentations or providing feedback to their peers, as they perceive voicing their views, especially those that are contradictory to teacher's view, as an impolite behaviour and as unacceptable (Sierens, Vansteenkiste, Goossens, Soenens & Dochy, 2009). Thus, students' disengagement from these activities demotivates teachers and many may revert to traditional practices. Teachers' personality may also prevent teachers from implementing learner autonomy. Teachers feel that students are not capable of taking responsibility for their learning (Tran, 2013). This belief could have stemmed from their experiences as students where their teachers constantly exposed them to control-orientated activities. As such, teachers do not feel confident to try these autonomy-supportive strategies in their classroom. Many teachers who operate in high-stakes examination contexts believe that they should be the expert who transmits accurate and relevant knowledge for their students' academic success (Klenowski, 2009).

Therefore, for teachers to implement learner autonomy, they must be allowed to participate in professional development programmes. However, such programmes tend to follow the cascading model (Hayes, 2000). A few teachers are selected and trained at off-site venues, and these teachers return to their workplace and teach their colleagues. These professional development models were not able to sustain desirable practices, for several reasons. For example, the cascading approach often diluted information (Norzila, 2013). This is due to only selected teachers receiving first-hand exposure; hence, the other teachers would only have limited knowledge of how to implement the desired practices (Nor Hasnida, 2016; Sedhu, Ali & Harun 2017).

To counter these inadequacies, more interactive and long term professional development programmes need to be introduced. Professional development programmes should move to more adaptive expertise models that accustom teachers to their environmental constraints (Darling-Hammond & Bransford, 2005). To ensure teachers' uptake of knowledge and skills, professional development programmes should establish what policy goals need to be addressed by the programme, to take into account teachers' diverse needs, and they need to demonstrate to the teachers their relevance and pay attention to teachers' existing practices (Luke & McArdle, 2009). Moreover, programmes should provide timely feedback and find venues for teachers to translate and sustain their practices (Pitsoe & Maila, 2012; Sehic, 2017). Luke and McArdle (2009) require an evaluation of the professional development outcomes. This is to ensure their achievement. By gaining feedback from teachers about how they perceive the programme, programme developers can decide which aspects of the programme work and which did not. By gaining this information, some modification can be done to improve the programme so that teachers' desired practices are sustainable.

Context of the Study

Malaysia, just like her neighbouring countries, is moving away from high-stakes external examinations, to the more holistic Assessment for Learning (AfL). In 2012, school-based assessment underpinned by AfL principles was introduced in primary schools; a top-down policy. Therefore, it became necessary to train the majority of the teachers. Due to the volume of teachers that needed to be trained, the cascading model of professional development was introduced. The traditional model of professional development that involved dormant formats (i.e. seminars), was short-term, took place away from school, and dealt with prescribed content, was found to be ineffective. These programmes ultimately put the responsibility on the teachers to translate the new knowledge into classroom practices. Suggestions for more contemporary professional development were put forward. It was shown that teachers are more successful in adopting practices, if they are actively engaged in professional development programmes.

That was why the Collaborative Professional Development Programme (CPDP) was introduced. Experts and teachers collaborated. The framework was influenced by Knowles' Four Principles of Andragogy (1984). These principles state that teachers need to be involved in the process, and experiences are the basis for active learning. Also, teachers must be interested in the learning objective because it has immediate relevance and impacts their professional being. Last, the programme should have problem-based content. Thus, from the very beginning, the CPDP did emphasize the active involvement of teachers in planning and evaluating their lessons when implementing learner autonomy. Learner autonomy was chosen as the central concept of the CPDP, because the Malaysian educational system introduced the AfL principles in schools and learner autonomy was the heart of AfL (Swaffield, 2011). According to Marshall and Drummond (2006), learner autonomy is the most difficult AfL principle to implement in the classroom. Thus, the researchers were confident that the CPDP was relevant to science teachers, as many of them were still upgrading their knowledge and skills on AfL. The CPDP supported teachers as they implemented autonomy-supportive strategies, such as asking students to assess their peers' work or to decide how they would present certain science content so that all could learn.

The CPDP began with the expert observing the teacher. Based on that observation the expert and teacher discussed, and the expert suggested how specific autonomy-supportive strategies could be added or done differently, so students could take responsibility for their learning. The teacher prepared her next lesson and together with the expert decided on one learner autonomy strategy that would best fit that lesson. If there were any additional teaching aids or materials, the expert would suggest how to develop or obtain those materials. In the end, the teacher decided how she would conduct the lesson. On the day of the lesson, the expert observes. Another round of discussion would take place where the teacher provides her views

about the completed lesson, mainly talking about her experiences with the learner autonomy strategies that were implemented. The expert provides feedback based on the teachers' comments and guides the teacher on how to improve the strategy in future lessons. This collaborative aspect of CPDP would continue until teachers have tried at least three learner autonomy strategies.

Thus in CPDP, the learning was personalised, and it allowed teachers to make mistakes, but they were supported and guided throughout. Once the teachers were observed for a least four lessons, a post-programme interview was held with the teachers. The semi-structured interview protocol elicited the factors that hindered them from fully implementing learner autonomy.

Data Collection Method

The research project took place between April 2017 and December 2018, with the aspects reported here constituting a sub-project, which occurred between March and July 2018. Three teachers participated in this sub-project. Zee, Sue and Melina taught at the same semi-urban national primary school. These teachers were selected based on their willingness to participate in this study, and all three were teaching science at Year 4 and Year 5. All three had at least a bachelor's degree in education, and they had not gone for any training on assessment for the last three years before the study. Their consent was obtained after a two-hour introduction to the concept of learner autonomy and the benefits of implementing these strategies in their science classrooms. They were given room to ask any questions or doubts about the projects. However, all three teachers did not agree with the use of video-recording; only audio taping was used instead. At the end of the programme, the teachers were interviewed to gain their views about CPDP. The post-programme interview is the primary source of data for this sub-project.

Using the post-interview data, inhibiting factors that prevent teachers from implementing learner autonomy was elicited using constant comparative methods. These inhibitors are categorised according to Reeves (2009) – three levels of pressure that prevent teachers from implementing learner autonomy: Pressure from above (i.e. examination demands and time); pressure from below (i.e. students not cooperating when asked to bring materials) and pressure from within (i.e. teachers not believing that students can acquire learner autonomy).

Findings

The findings of the study suggested that despite the collaborative nature of the CPDP, Zee, Sue and Melina still verbalised constraints that inhibited them from implementing learner autonomy strategies.

Pressure from above

All teachers felt that implementing learner autonomy did prevent them from using valuable time to prepare their students for examinations. Melina felt that the additional time needed to implement learner autonomy could be used more productively, for reinforcement practices to help students to get a clearer understanding of the content.

> *... if I had that time, I might continue with the extra questions with them. After hands-on activity, maybe extra question on that particular activity, maybe they can get a clear version ...*"
>
> (Post Interview, Melina)

Zee claimed that even though the activities that supported learner autonomy were good, she felt that she was only willing to try these activities after their final examinations.

> *"…..so I think this pairing is good, so I will try for Year 6 also later … after UPSR is over, …."*
>
> (Post Interview, Zee)

Despite efforts by the CDPD to help teachers integrate learner autonomy in their daily lessons, these teachers continued to treat learner autonomy practices as isolated tasks. They were unable to conceptualise learner autonomy activities as integral to their pedagogy. They still believed that learner autonomy is an "add-on" to their daily teaching and learning activities, and they were only willing to practice learner autonomy after the examination. Therefore, they were unable to embed learner autonomy strategies in their daily lessons.

> "*for example, after exam or during end of the year, when there's nothing on, I will give activity like this to refresh again their memory on the topics they have studied. ... for teachers who are quite busy like me, so there's like time constraints because it clashes with our work."*
>
> (Post Interview, Sue)

In one discussion with Sue, the expert suggested that she ask her students to prepare questions to ask their peers, and she could then create an off-line Kahoot! game where students with the answers could run to the front of the classroom and deposit their answers in a box. Even though CPDP encouraged teachers to use whatever resources were available to them and their students for the activities, the teachers felt that the implementation of learner autonomy was due to the lack of resources, especially technology.

> *'Yes, technology is lacking. Actually, I prefer to do presentations using LCD'*

(Post Interview, Sue)

'...they don't have really lot of technology here, even LCD .... also we need to borrow from teacher and only one LCD for thousand pupils in this school...'

(Post Interview, Melina)

Zee claimed that the unsuitability of basic classroom amenities such as tables and chairs hindered her implementation of learner autonomy. Making students work in groups or interact among groups was more difficult with the existing physical resources.

Ok, for me, ..., disadvantage is that we don't have space to move because the volume of the student is high in our school."

(Post Interview, Zee)

These teachers felt that resources such as technology would ease their efforts in implementing learner autonomy; even though the expert had shown ways to give students autonomy without technology.

Pressure from below

In contrast, Sue claimed that learner autonomy activities required various materials, and in a larger quantity that leads her to opt for bigger group activities instead of pair-work.

"*Because I seldom used pair work. I mainly used group work because err, one major problem's lack of material, right? So, pair work, I need a lot of materials..."*

(Post Interview, Sue)

When teachers move from 'chalk-and-talk' pedagogy to active participation from their students, the activities become plentiful, and this requires more materials. The teachers claimed that they overcome the lack of resources by asking their students to bring materials from home. The teachers claimed that students were not cooperative, and they tend to forget to bring necessary items from home that are vital for the implementation of learner autonomy. Thus, teachers need to re-plan their lesson, and thus the learning outcomes were compromised. For example, Sue lamented that her students forgot to bring the required materials for pair-work and thus, she had to re-assign students into larger groups that proved ineffective.

"*Challenges is that first of all, students forgot to bring the things. So, it makes me to rearrange everyone. So, my concern was want to mix student so that there are pairing with the poor and the better one. But, at last I have to mix them due to lack of materials."*

(Post Interview, Sue)

Pressure from within

One of the predominant inhibitors of teachers implementing learner autonomy, was their belief that students were unable to take responsibility for learning. Evidently the teachers were quite apprehensive about delegating the responsibility for acquiring knowledge, to their students. When Sue was asked if she felt that her students were able to be autonomous, she was quick to respond in the negative. Melina said that she believed that spoon-feeding was a necessity, without which, the students would be rendered helpless in learning. Only with step-by-step guidance could her students conduct a given activity.

> *"Ok, they can do activity, but what I saw is that they can actually listen to orders. Listen to orders means we have to tell them step by step, then only they will do."*
> (Post Interview, Melina)

Similarly, Zee believed that students' inability to cope necessitates her providing them with all the information, instead of eliciting answers through their own discovery.

> *"...I have to tell them. If I don't, then it's ...difficult...they can't do it.*
> (Post Interview, Zee)

Thus, all teachers in this study believed that their students were incapable of being autonomous learners and that teachers were still the primary knowledge providers.

Discussion and Conclusion

Despite undergoing CPDP where each teacher was supported by an external expert to implement autonomy-supportive strategies, they still disclosed some inhibiting factors preventing the successful implementation of learner autonomy. The data from this study showed the inhibitors were aligned with Reeves' (2009) framework of three levels of pressure (i.e. from above, below and within). Pressure from above included time constraints and the extra workload. These teachers claimed that they were only willing to implement learner autonomy after the examinations. In Malaysia, school examinations are centralised, and teachers are required to follow a schedule for the academic year. As such, these teachers must ensure that their teaching and learning schedule is aligned with their colleagues.

However, implementing learner autonomy takes time, and the participating teachers felt that they needed to play 'catch-up' if they were to implement learner autonomy and simultaneously prepare their students for the examinations. Thus, external demands and accountability prevented teachers from implementing these strategies that could have a positive impact on student outcomes (Sierens et al., 2009; Tran, 2013). Therefore, to improve

the uptake of CPDP is to ensure more teachers are involved in the schools, so that it would become a school culture, and teachers may re-negotiate the present schedule to accommodate strategies that encourage learner autonomy. The CPDP would be more successful were there a community of practice, rather than isolated teachers implementing learner autonomy (Goddard & Goddard, 2007). The implementation of school-based assessment encourages learner autonomy, but there are little changes to the prescribed text and curriculum. Thus, teachers are torn between taking up the expert's suggestions and guidance, and accountability. Thus, collegial collaboration may impact more significantly on teachers, to introduce autonomy-supportive strategies in classrooms.

One of the pressures from below, according to these teachers, were students not being cooperative. When asked to bring required materials, many did not do so. This prevented teachers from carrying out the scheduled tasks. This could be due to the CPDP focusing only on teachers, and neglecting the other relevant entity, the students. Therefore, CPDP needs to introduce the concept of learner autonomy to the students. Only then are teachers and students able to negotiate a 'comfortable degree of autonomy' (Kumaravadivelu, 2003; p. 143). The CPDP had failed to take into account this symbiosis, and so students are in the dark about the importance of their involvement and ideas in this process. CPDP needs to highlight these student-teacher interactions in the educational process.

Teachers believed their students to not be capable of taking responsibility for their learning. Studies have shown that changes in teachers' beliefs, even after training, were difficult or somewhat hard to change (Johnson, 1994; Mathioudakis, 2007). Kennedy (1997) suggested that for teachers to change their beliefs would require their reflecting on their own identity. They must be given opportunities to confront their beliefs in light of the introduced concept. The CPDP, due to time constraints, had only discussed the conceptualisation of the learner autonomy with the teachers. Even though teachers were given a chance to voice their concerns and doubts, the focus of teachers' reflections was not prioritised in the CPDP. Including this component in the CPDP, and more explicit guidelines on how teachers should do these reflections, would allow teachers to better voice their concerns and doubts.

Even though CPDP was conceptualised as flexible and long term, with teachers' active participation, and expert support and guidance as teachers attempted autonomy-supporting strategies, there were still inhibiting factors that prevented the CPDP from being successful. It is crucial to elicit these factors so that constructive and forward-looking actions can mitigate these inhibiting factors. Only then there can be a systemic change that would allow a holistic implementation of learner autonomy.

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