

Action research as professional development: Its role in education reform in the United Arab Emirates

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This paper is concerned with exploring the microsystem of teachers' experiences with education reform within the action research (AR) model for professional development (PD). Within the macrosystem of current major education reform in the UAE, it is timely to explore teachers' experiences of AR as PD to improve pedagogy. The process of engaging in AR for PD is explored through a pragmatic lens, insisting on treating research as a human experience based on the beliefs and actions of practitioners. The paradigm of critical pragmatism acknowledges the interpretive cycle but at the same time does not limit the research methods which may be used. In this study, a survey has been used to gather data. The study found that more individual support should be given to teachers during the AR process, that teachers should be allocated more in-school time to work on classroom-based research and that, where applicable, more academic research materials need to be made available in languages other than English.

Introduction

In the United Arab Emirates (UAE), professional development for educators has become a cornerstone of education reform initiatives. Scholars have explored the improvement of teacher quality as a core tenet of education reform (Darling-Hammond, 2000; Buckner, Chedda & Kindreich, 2016). Education policy makers have been developing curricula with specific learning outcomes aligned with international standards, as well as a rigorous teacher licensing system. With reference to Bronfenbrenner's ecological systems model (1979), education reform takes place within all domains – the exosystem, macrosystem, mesosystem and microsystem. This paper is concerned with exploring the microsystem of teachers' experiences with education reform within an action research (AR) model for professional development (PD). We also argue for recognition of AR as a way of promoting teacher autonomy by recognising that it is beneficial to teachers, because teachers are best suited for defining problems in the classroom and developing solutions (Dana, 2013). PD can effect great changes in pedagogy (Garet, Porter, Desimone, Birman & Yoon, 2001) in the microsystem of the classroom. Therefore, within the macrosystem of current major education reform, it is timely to explore teachers' experiences of AR as PD to improve pedagogy.

PD should not be limited to training sessions or limited contact such as departmental meetings (Garcés & Granada, 2016). Successful PD should be aligned with school goals in order to drive teacher and student improvement (Archibald et al., 2011). The process of teachers sharing what works, using the latest research, and reflecting on their practice, lead to positive gains in teacher's development (Garcés & Granada, 2016). High quality PD for teachers should not only be focused on reflection and inquiry, but also PD should be

contextually specific (Kedzior, 2004). Quality PD should provide teachers with an opportunity to collaborate, research the latest innovations in improving student achievement, and provide opportunities for teachers to share best practices with each other (Kedzior, 2004). AR provides a solution for engaging in such PD.

AR is research that is conducted by teachers in the classroom (O'Connor, Greene & Anderson, 2006). It is a scholarly paradigm grounded in both critical theory and constructivism, which call for authentic learning that is supported by applications to real life issues and critical reflection (Mthethwa-Sommers, 2010; Young, Rapp & Murphy, 2008). Teachers 'taking a self-reflective, critical and systematic approach to exploring own teaching practices' (Burns, 2010, p. 2) by using AR have the potential for engaging deeply in education reform within the microsystem of a school.

Exploring the affordances and challenges of implementing AR as PD is central to this paper. Lave and Wenger's theory of *community of practice* also has relevance to this study as parts of the AR were conducted collaboratively. The term was originally coined with reference to the community that 'acts as a living curriculum for the apprentice' (Wenger & Trayner, 2015). In the school situation, teachers as lifelong learners can be seen as the apprentices who are learning from the living curriculum of the classes they are dealing with, in a reflective cycle.

Literature review

Action research as professional development

PD may encompass education, training and technical assistance (NAEYC & NACCRRA, 2011). As many countries have increased their focus on quality improvement activities, the terminology around PD and training has become a critical issue. The mode of delivery of PD is considered to include not only lectures and workshops but also mentoring, coaching, consulting, advising and peer-to-peer technical assistance (NAEYC & NACCRRA, 2011, p. 4).

PD becomes more meaningful and effective when teachers become active in their professional learning (Archibald et al., 2011) by connecting current educational best practice to classroom application (Garet et al., 2000). The most common PD models tend to take a 'top down, one size fits all' perspective, providing little room for critical reflection and action (Martell, 2014). AR provides opportunities for, and indeed demands, a level of critical reflection and action which supports education reform. AR is a very powerful PD process because its goal is to develop practical knowledge alongside action and reflection (Steele, 2012).

AR can be seen as a more applied model of PD where teachers have more confidence in finding solutions to problems faced in their classrooms (O'Connor et al., 2006). O'Connor et al. (2006) found a range of benefits including the following: it challenges teachers to focus on analysing students' work; it heightens teacher awareness of student

needs; it helps teachers to be more critically reflective in their practice; it positively effects pedagogy because the process constantly pushes teachers out of their 'comfort zone'.

Professional development in the UAE

Models of PD vary across the seven emirates of the UAE as different bodies have responsibilities for its implementation. The Ministry of Education (MoE) has overall responsibility for education, particularly in the emirates of Ras al Khaimah, Umm al Quwain, Ajman, Sharjah and Fujairah, while both MoE and the Knowledge Health and Development Authority (KHDA) have responsibility for the emirate of Dubai. The Abu Dhabi Education Council (ADEC) had responsibility for PD in the emirate of Abu Dhabi until 2017. ADEC has been heavily involved in education reform since 2009 and has stipulated that teachers must spend 90 minutes per week on mandated PD. Between 2009 and 2015, different education companies were contracted to work with ADEC's PD department and facilitate training in schools in a program called 'Tamkeen'. They worked in individual schools, for the most part, on a weekly basis to help with the education reform process. 'Tanmia' was an initiative led by the same training companies in collaboration with ADEC's PD department in the year 2014-2015. This initiative required teachers to attend week-long sessions of PD in a central location. As teachers in the UAE come from various national backgrounds, their education backgrounds vary widely (Buckner et al., 2016). Incoming policies regarding teacher licensure are sure to have an impact on parity of qualifications required and therefore it is of relevance to explore the avenue of collaborative AR as PD in the emirate of Abu Dhabi. Recent policy changes (September 2017) mean that ADEC has now been renamed as the Department of Education and Knowledge (ADEK).

Collaborative AR within education reform

PD in the context of the UAE has been utilised to help educators engage with education reform. The AR movement in the UK stemmed from attempts to change the education curriculum (Elliott & Tsai, 2008). Education reform occurs within specific contexts around the world (Elliott & Tsai, 2008). Within the UAE, there are opportunities for mutual learning between local and expatriate teachers (Dillon, Salazar & Al Otaibi, 2015). This cultural exchange should be considered a form of PD within the context of education reform.

PD is an activity that should be job embedded and promote the use of mentoring (Demonte, 2013). With successful PD it is critical that teachers construct their own knowledge while learning from and with their colleagues (Martell, 2014). AR can accelerate collegiality and rapport among teachers (Steele, 2011; Martell, 2014). AR is effective because it requires teachers and researchers to work as collaborative groups by developing and following a set of goals and objectives that necessitate critical reflection, testing of ideas in practice and ultimately, developing strategies that improve pedagogy (Capobianco & Feldman, 2006; Hine, 2013). Working collaboratively in this manner can collectively increase teachers' agency in enhancing pedagogy and improving practice. For Lewin, one of the foremost thinkers in the field of AR, it is exemplified by 'the discussion

of problems followed by group discussions on how to proceed' (Adelman, 1993, p. 9). This should be followed by collaboratively monitoring and keeping notes about any interventions, following a cycle similar to Kolb's reflective cycle.

The Confucian concept of harmony can maximise the possibilities of all participants without sacrificing any of their individual qualities (Elliott & Tsai, 2008). Cooperative learning as a type of professional engagement could involve 'discussion and conversation in order for each individual to articulate and determine appropriate and meaningful actions in their lives' (ibid., p. 528). These actions, when applied to work in schools and classrooms, can lead to meaningful reforms in pedagogy.

Lewin had 'developed the methods and principles to enable the school to act as the agency of democratic change within its community' (Adelman, 1993, p. 11) in accordance with the progressive education movement being explored by Dewey at the time. The concept of a 'pedagogy of possibility' (Darder, 2012) holds resonance in any discussion of AR, particularly in an education reform context. AR helps to affirm the scholarly significance of the teaching profession (O'Connor et al., 2006).

Teaching is a 'practice profession' (Gurm, 2013, p. 1). It is 'transformation through critical analysis' (ibid.). Indeed, we can describe knowing as emancipatory once 'knowing' is critically examined within the context (Gurm, 2013, p. 4). If emancipatory knowing is 'developed through action in and on reflection or praxis' (ibid.) then AR can be seen as a form of emancipation. This is particularly relevant within a context of education reform where teachers found that AR not only invoked a new excitement in teaching, but also developed self-efficacy and teacher self-confidence (Martell, 2014).

Challenges to PD and AR

There can be barriers to teachers willingly participating in PD. These include a lack of time, a lack of administrative support, a sense that it is not meeting their needs, and a feeling that it is a waste of time (Buckner et al., 2016). Other critical challenges that are inherent to AR are that it is time-consuming and can be messy, and it is personally demanding (Simonsen, 2009). Teachers can find it difficult to find time to promote collegial conversations, which is a corner-stone of AR (Park & So, 2014). Day-to-day responsibilities, and attending workshops and staff meetings, can kidnap the true meaning of AR (Park & So, 2014). Teacher-researchers may find it difficult to maintain an objective viewpoint (Brown, 2002). Teachers also tend to question the validity of the data they collect while teaching (Hine & Lavery, 2014).

Research questions

The model of AR in PD explored in this study (Dana, 2013) was implemented by GEMS Education as an approved provider of mandated PD in the Emirate of Abu Dhabi. Two research questions were adapted from O'Connor et. al.'s 2006 study, and one was added to suit the particular context of this study. The research questions are:

1. What do teachers report as the most effective parts of the AR process? (O'Connor et al., 2006)
2. How has participation in AR impacted teachers' current and future instructional practices?
3. Are there differences in teachers' perceptions of the most effective parts of the AR and the impact of AR, depending on the model of PD offered (withdrawal off campus vs. whole school approach on campus)?

Method

Morgan held that 'pragmatism insists on treating research as a human experience that is based on the beliefs and actions of actual researchers' (2014, p. 1051). The paradigm of critical pragmatism acknowledges the interpretive cycle, but at the same time does not limit the research methods which may be used (Kadlec, 2006). It is with this lens that the process of AR as PD is explored in this paper in a primarily quantitative manner seeking no definitive answers but rather mean scores seeking to stimulate deeper exploration. A small number of text responses were analysed qualitatively.

This study took place over the course of a two-year period. During Year 1, a group of six teachers from different schools within Abu Dhabi Education Council (ADEC) were given the option of pursuing AR (referred to as 'Teacher Inquiry') as a strand for mandated PD. They were withdrawn from school to a central location and completed the 14 Facilitated Teacher Training (FTT) sessions over 4 days spaced across the year (see Appendix A). After each FTT, they worked on their AR on their own time. These teachers chose topics that they were interested in researching, such as reading strategies, character education and behaviour management.

During Year 2, one ADEC public kindergarten school chose the option of taking 'Teacher Inquiry' as a whole school strand for PD. Thirty-three ADEC teachers in the school worked on six AR projects. Fourteen FTTs (a replica of the FTTs offered to the Year 1 cohort) were conducted after school over a one-year period to support this process. The teachers were also mentored in large group and small group settings. The Senior Leadership Team (SLT) chose AR as a method of implementing School Improvement Planning (SIP) goals of improving speaking and listening skills, and critical thinking skills. The SIP goals were written collaboratively by the SLT and the teaching staff.

A 14-item survey was administered to participants. Permission to use this instrument was obtained from the authors (O'Connor et al., 2006). It was administered on paper in English to all six participants in the Year 1 cohort. All six were completed for a 100% return rate. For the Year 2 cohort, 33 bilingual (English and Arabic) surveys were sent electronically through *Survey Monkey* (<http://www.surveymonkey.com>). There were 22 surveys completed for a 67% return. 15 were completed in English and 7 were completed in Arabic. All teachers were bilingual to some extent, but were invited to complete the survey in the language in which they felt most comfortable.

The 14-item survey was divided into three sections of questions. Part 1 asked respondents to rate the difficulty they experienced with 5 components of action research; defining the research question, writing the literature review, developing and writing the method, analysing the data, and organising and writing the findings. A 5-point Likert-type scale representing a descending level of difficulty ranging between 5 (extreme level of difficulty) and 1 (no difficulty) was used. A mean score was calculated in order to get an average score of perceived difficulty or ease in each area.

Part 2 of the instrument consisted of 5 statements regarding the value of their own research experience. It dealt specifically with the impact AR had on the teacher's learning and on student achievement. In this section, a 3-point scale was used ranging from 3 (disagreement with the statement) to 1 (agreement with the statement). Each question in Part 1 and Part 2 included a comment box for respondents to indicate any other information. Part 3 consisted of open-ended questions which asked the teachers questions regarding the value of their AR experience (O'Connor et al., 2006). There were not enough text responses given to analyse them under categories. Instead, salient text responses are presented as they help to elucidate a point. Respondents have been denoted by a code such as 'Y1A' (Year 1 Teacher A) or 'Y2F' (Year 2 Teacher F). Year 1 respondents range from Y1A to Y1F (6 respondents) and Y2A to Y2R (18 respondents who responded with a comment).

Findings part 1: Mean score for perceived level of difficulty of teacher inquiry

Here follows an analysis of the findings related to the perceived level of difficulty experienced by participants in terms of mean score (Appendix B, Table 1). The standard deviation (SD) is reported for the Year 2 cohort while it is not reported for the Year 1 cohort due to the low number of participants.

Defining the research questions

Year 1 cohort

Defining the research question had a moderate difficulty average (2.83). Three teachers indicated a low level of difficulty, one teacher indicated a moderate level of difficulty, and 2 teachers indicated a high level of difficulty. The following comments were made:

- Y1A: the issue of student disruptions in my class was of paramount importance to me, so deciding on a research question was an easy decision to make.
- Y1B: because of inexperience with research, it was difficult to define the goal and research question clearly.
- Y1C: I thought I had written a good question but when peer reviewed, it required help to change and modify it.

Year 2 cohort

Defining the research question had a low-moderate difficulty average (2.23; SD 1.00). 45% of the teachers indicated a low level of difficulty, while only 2 teachers indicated a high or

extreme level of difficulty. Three teachers (Y2D, Y2F, Y2R) commented that it was already decided by SIP goals while Y2H commented that ‘The topic is so broad it was difficult to pinpoint exactly what our team wanted to focus on’. Y2N highlighted the issue of working as a bilingual group: ‘we had to translate the question into Arabic and sometimes it made no sense in Arabic, so we had to revise a couple of times’.

Writing the literature review

Year 1 cohort

Writing the literature review had a moderate difficulty average (3.00). Y1E commented that ‘writing the literature was an arduous task’. Y1C commented that ‘most of the difficulties in writing the literature review originated from sequencing the literature review and finding sources’. Y1D’s difficulties stemmed from having difficulty finding up-to-date references. Y1F commented that ‘there are very few references in Arabic’ and also highlighted the lack of modern references on the topic.

Year 2 cohort

Writing the literature review had a low-moderate difficulty average (2.55; SD 1.23). Two teachers (Y2J, Y2K) stated that most of the references were in English and not in Arabic and therefore they didn’t have enough resources available.

Developing and writing the method

Year 1 cohort

Developing and writing the method had a moderate difficulty average (2.8). Y1A commented that ‘developing and writing the method was difficult because I am just an ordinary teacher who is carrying out action research in my class’. Two teachers (Y1E, Y1F) agreed that the school day activities and teaching responsibilities were instrumental in perpetuating difficulties in developing and writing the method.

Year 2 cohort

The participants experienced a low-moderate difficulty average (2.59; SD 1.15). Two teachers did report an extreme level of difficulty. One teacher (Y2M) commented that time in school was limited while two mentioned the issue of sharing the workload with colleagues in a negative light (Y2F, Y2O). Another teacher stated that not enough training was given (Y2E). Two teachers (Y2J, Y2K) highlighted the challenge of finding references in Arabic and stated that she had to frequently seek help from her English-speaking colleagues.

Analysing the data

Year 1 cohort

Analysing the data showed a low difficulty average (2.5). Y1D had difficulty in analysing the data because it was difficult to be objective. Y1B had difficulty with data because ‘data differs from one step to another and sometimes it is difficult to decide on the data you will need’.

Year 2 cohort

Analysing the data had a low difficulty average (2.33; SD 1.08). One teacher commented that they had a lack of training in the area (Y2E). One participant said that it was useful to make graphs to analyse the data. One teacher said that there were too many people on a team and the responsibility fell on the same staff members again and again (Y2O). Another highlighted that it was difficult to choose exactly how to use the data (Y2L).

Organising and writing the findings*Year 1 cohort*

Organising and writing the findings carried a moderate difficulty average (2.8). Y1C commented that 'once a process was developed, it was obvious where the data belonged'. Y1A reported that 'because of my inexperience of using data in my classes, organising and interpreting the data posed difficult'.

Year 2 cohort

This question carried a low difficulty average (2.32; SD1.22). 8 teachers stated that this carried no difficulty while 4 teachers said it carried a low level of difficulty. Eight teachers reported that this aspect of the research process carried a moderate level of difficulty, while two teachers felt that is carried a high level of difficulty.

Findings part 2: Impact of teacher inquiry

Here follows an analysis of the findings related to the impact of teacher inquiry experienced by participants in terms of mean score (Appendix B, Table 2)

Statement: 'Teacher inquiry adds value to the teaching and learning process for me as a teacher'*Year 1 cohort*

This issue had a mean score of 3.00 which indicated that the teachers were all in agreement that action research was valuable to the teaching and learning process. Y1B commented that 'action research allows teachers to become agents of change in their schools'. Y1D commented that 'Action research has refocused my teaching on best practices and action research has challenged us to be reflective in our teaching practices', while Y1E stated that 'Action research is a valuable process because it improves our teaching'. Y1A agreed that 'action research has piqued my interest in research and through research, it has allowed me to develop a stronger pedagogy in my daily teaching practice'.

Year 2 cohort

This issue held a mean score of 2.35 (SD 0.76) which indicates that over 50% of respondents agree that teacher inquiry adds value to the teaching and learning process for a teacher. 17.65% (n=3) of the cohort did not agree that this is the case. Y2G stated that she did not enjoy the process but that she is happy to implement it for another researcher. Y2Q said that the 'research makes you implement the strategy continuously which forces

you to see results'. Y2O said that 'it would be better to do it individually rather than in a group but that it was helpful to have others to help'.

Statement: 'Teacher inquiry adds value to teaching and learning for students'

Year 1 cohort

This issue held an average of 3.00 which indicated that the teachers believed that inquiry is valuable to teaching and learning for students. Y1B commented 'that action has challenged me to find solutions to resolve any important issue in my teaching practice'. All of the teachers agreed that action research is valuable to the teaching and learning process for students and Y1D noted that 'it has challenged me to find differentiate strategies to make lessons interesting and to make my students successful'.

Year 2 cohort

This issue held a mean score of 2.53 (SD 0.61), indicating overall agreement with this statement. One teacher disagreed with the statement and 35.29% (n=6) did not feel strongly either way. Y2G stated that the strategy she implemented 'helped the shy children to share their ideas'. Y2P said that 'if the strategies were not introduced correctly it could take away from valuable teaching time'.

Statement: 'The action research positively impacted my students' learning'

Year 1 cohort

The teachers' average score of 2.33 indicated that they did not feel strongly either way about the impact the research had on student learning. However, overall the teachers' comments indicated that their particular study gave them valuable tools to help their students to be successful. Y1A commented that 'the process gave my students a valuable tool to use to resolve conflicts'. Y1D commented that 'teacher inquiry challenged me to learn more about the levels of my students and the most suitable ways for each step'. Y1E commented that 'teacher inquiry tailors our teaching to our student's learning'.

Year 2 cohort

No teachers disagreed with this statement and the mean score of 2.53 (SD 0.50) indicates that the kindergarten teachers overall agreed that action research has an impact on student learning. Two teachers (Y2J, Y2K) said that they would need more time to see the impact. Y2A said that the strategies implemented in the classroom as part of the research was facilitating deeper thinking and 'thinking outside the box' among students.

Statement: 'This action research project positively impacted my learning'

Year 1 cohort

The mean score of 2.83 indicates that teachers agreed that action research positively impacted their own learning. Y1A commented that 'the process allowed me to become reflective about my teaching practice'. Most teachers agreed that research had improved their teaching practices and how they plan their lessons.

Year 2 cohort

The mean score 2.71 (SD 0.46) indicates overall agreement that teacher inquiry has a positive impact on teacher learning. Y2M stated that 'I learned what I like and don't like. Also what I'll do differently in the future'. Similar comments were made by two other teachers (Y2E, Y2F) in relation to the change in routine and encouragement to take risks in teaching practices. Y2O said that 'I was able to see first-hand how well it worked in another colleague's class and definitely saw how beneficial it could be in my own

Statement: 'I view myself as a teacher researcher'*Year 1 cohort*

This component had a mean score of 2.00 which indicated the teachers did not feel strongly either way about this issue. Y1C commented that 'this process allowed me to become an action researcher; someone who is capable of finding answers to prevailing issues in the classroom'. Some of the teachers indicated that they are changing their teaching practices (Y1A, Y1B) and Y1E commented that as a result of doing teacher inquiry, she is able to select and analyse the areas that she needs to improve.

Year 2 cohort

This component had a mean score of 2.21 (SD 0.99), indicating that the teachers did not feel strongly about themselves as teacher-researchers. A number of teachers did not understand the question (Y2J, Y2K, Y2P), and Y2Q said that it was not a comfortable role for her.

Findings part 3: Open-ended questions

Part three contained open-ended questions that asked the action researchers to respond to questions that focus on the impact of action research on instructional practices, professional careers and issues that surfaced while engaging in action research.

Long-lasting effects of action research

Question: 'Describe the long-lasting effects, if any, that you believe the action research project will have on your professional career'.

Year 1 cohort

According to Y1A, 'One of the lasting effects of this action research is knowing that I can find viable solutions to the problems and issues in my classroom'. Y1C revealed that teacher inquiry has motivated her to create new successful methods to teach her students reading. Y1B and Y1F made comments to the effect that they were more motivated to discover their students' interests.

Year 2 cohort

Y2P said that the research has helped to develop her working relationship with her co-teacher which will benefit future co-teaching relationships and therefore benefit children's learning. Y2E said that she had learned to not accept a student's first answer and to take

time to encourage new ideas and new thinking among the children. Y2G stated that 'It made me realise that there is always another way of doing things - how I may be able to cater to those different learning styles', while Y2D said that 'My planning is now shifted to a more creativity-based learning'. A number of respondents (Y2I, Y2Q, Y2F) made comments about how the project made them realise that they should reflect on their teaching more.

Confidence and empowerment

Question: 'In what ways has the action research experience empowered you and/ or your teaching?'

Year 1 cohort

Y1D made the following statement: 'Teacher inquiry has empowered me to become an agent of change. It has motivated me and gave me courage to try new teaching methods in the classroom and to take risks to enhance student learning'.

Year 2 cohort

Three teachers (Y2A, Y2L, Y2G) made comments about how reflective practice can enhance the teaching and learning process. Y2M said that the research process makes the teacher more active and more in tune with the needs of the children. Y2N said that 'It keeps you on your toes, there is always something new to learn, new discoveries which makes classroom teaching exciting'. Y2H stated that 'Opportunities were provided to students in order to enhance learning'. Y2C stated that she 'felt it was time consuming and was a distraction to my overall teaching'.

Daily instructional practice

Question: 'Has your research informed your instructional practice?'

Year 1 cohort

Teacher inquiry has positively impacted the teaching practices of most teachers. Y1B commented that 'the inquiry method has encouraged us to learn more deeply about our students'. Additionally, teachers revealed that they have been able to learn more about their students' skills in the teaching and learning process (Y1F, Y1E). Y1A reported that teacher inquiry has 'motivated us to define the right and wrong ways and the best adjustments to be done to improve the teaching and learning process'. Y1C stated that 'Teacher inquiry has impacted my teaching practice by limiting the amount of time in teacher instructions and enabling students to focus and retain concentration during classrooms activities' while Y1D said that 'Teacher inquiry has also positively impacted my daily instructional practices because I have incorporated new methodologies from the research findings'.

Year 2 cohort

Y2G said 'Yes, I can see my class being more student based/focused'. Y2M made a comment relating to organisation when stating that 'Yes, needing to be a better organiser

for classroom instruction and research'. Y2E said that she would continue to implement the strategy in the future. Y2I commented that she became aware that children learn in a different way to adults and has more confidence in catering for different learning styles.

Issues in action research

Question: 'What issues arose while engaging in teacher inquiry and how did you resolve them?'

Year 1 cohort

Y1F revealed that the language barrier had a negative impact on her ability to carry out the action research and that the different ability levels of the students became problematic when conducting her tests. Y1A stated the following 'Our inquiry workshops provided sufficient support when difficulties arose while doing my research. This support organised our ideas and our advisors and peers challenged the teachers to reflect and re-think'.

Other difficulties experienced by some of the teachers consisted of compiling the large amount of data and placing it into themes or categories. Y1B made a comment relating to time management when saying that 'the time I needed to do the research was a significant issue and this problem was managed through support and cooperation of our administrative and teaching staff'.

Year 2 cohort

Three comments made by teachers related to wanting more time to do the research. Y2G commented that because time was an issue 'PD weeks given by ADEC should be 100% allocated to the action research since that was our chosen PD method this year'. The Arabic medium teachers commented that they needed more Arabic-language references (Y2J, Y2K, Y2N). This issue was reinforced by the following comment by Y2C: 'too many people on a team - language barrier amount team members - main responsibilities fell on English staff'. Another two teachers (Y2L, Y2E) said that organising the classroom was difficult in the early stages but relationship with co-teachers helped to resolve the issue.

Discussion

This section will address each of the research questions in turn with reference to the literature. Standard deviations for the Year 2 cohort for Part 2 of the survey were considerably lower than for Part 1 of the survey, which indicates more clustering of responses around the mean for Part 2.

1. What do teachers report as the most effective parts of the AR process?

Teachers in this study reported that AR enabled them to find viable solutions to problems that surface in their classrooms and to be more reflective in their daily teaching. Engaging in reflective practice appeared time and time again in teachers' comments in terms of increased capacity for selecting and analysing areas for improvement. Some teachers noted that their teaching improved while they were engaged in AR as they were more focused on effecting change. Furthermore, it was noted that the continuous implementation of a

specific pedagogy forces one to see results. Hewitt and Little (2005) and Steele (2012) concurred that AR is powerful for teacher development because classrooms become laboratories for learning. As one teacher reported in Steele's study, 'action research is more effective than PD because unlike the workshop model of listening to a presentation, action research allows the participants to collaborate over a long period of time' (2012, p. 26). Additionally, O'Connor et al. (2006) described AR as an avenue for continuous learning because it is authentic and meaningful to the teachers. Teachers in this study reported more of a willingness to take risks in trying out different things, similarly to Steele (2012). Some teachers also reported that the process has piqued their interest in AR.

2. How has participation in AR impacted teachers' current and future instructional practices?

Teachers in this study reported that AR allowed them to become agents of change within the instructional practices of the school, similarly to findings by Steele (2012) and Dana (2013). It also challenged them to find solutions to problems, implement best practices in teaching, as well as improve their lesson planning process. Quality teacher professional development begins with education that connects current educational best practice with what is practical in the classroom (Garet et al., 2000; Archibald et al., 2011). Teachers reported that through peer observations of other inquiries, they were able to see firsthand how a strategy was implemented and how well it worked. They were then able to build on the opportunities presented by those strategies in their own classrooms. This is consistent with other research (Park & So, 2014; Shanks et al., 2012). This enhanced collegiality helped teachers to develop a stronger understanding of different teaching methods.

Teachers also reported that engaging in the process of AR positively affected their teaching efficacy because they developed a more caring attitude towards their students, interested in their interests and learning styles. The process has impacted their teaching by limiting the amount of didactic instruction time, leading to students being able to independently focus and retain concentration during classroom activities. Teachers learned to encourage students to be deep thinkers and not just accept the first answer a student gives. It enhanced their awareness of being more active and more creative in their approach to teaching and learning. These findings are consistent with other research (Shanks, Miller & Rosendale, 2012; Park & So, 2014).

3. Are there differences in teachers' perceptions of the most effective parts of the AR and the impact of AR, depending on the model of PD offered (withdrawal off campus vs. whole school approach on campus)?

Some differences emerged between the experiences of teachers involved, depending on the model of PD offered, i.e. withdrawing teachers from campus to do an individual AR inquiry versus collaborative school-based AR. The major differences seen in these two were in support for the teachers regarding defining a research question, developing a method, writing a literature review, sharing of workload and commitment to the process. The Year 2 cohort had a mentor on campus at all times throughout the AR process coupled with regular time allocated to reading groups with the training specialist. For the Year 1 cohort, their support was sporadic and limited, albeit more intensive when it did take place.

It appears that the Year 1 cohort had a more difficult task than the Year 2 cohort in defining their research question. There are two possible reasons for this. In the Year 1 cohort, defining the research question became a more arduous process because the research question was constantly being refined and changed through peer review. However, for the Year 2 cohort, research questions had been outlined by the School Improvement Plan Committee and more intensive individual advice was given to the teachers because there was weekly and, where necessary, daily support available from the training specialist and the Head of Faculty, who worked full time on the campus. In both cohorts, a language barrier and translation became an issue when trying to understand the true meaning of the research question.

With regard to developing the method, the Year 2 cohort seemed to have an easier task. The Year 1 cohort faced a moderate level of difficulty with this task due to their own individual time management. The teachers reported that it was difficult to divide the time between teaching/school duties and conducting the research. These findings are consistent with Martell's 2014 study where his teachers faced similar difficulties. The Year 2 cohort had a less difficult time with this because more time was provided for them to work in their groups during the allotted PD time during the day. The Year 2 cohort experienced a low to moderate level of difficulty in writing the method. However, the difficulties experienced by this group stemmed from the fact that some participants felt that the work load was not equally shared in the group. One possible reason for this was that the groups were heterogeneous with both English and Arabic speakers. Translations had to be provided by group members so therefore, the workload could have been unevenly distributed.

In developing the literature review, it seems that the Year 2 cohort also faced an easier task. 80% of the teachers in the Year 1 cohort had a moderate to high level of difficulty in writing the literature review. One of the major problems that surfaced was finding relevant literature, especially with the Arabic speakers. While finding relevant literature in Arabic was a difficulty for both cohorts, as was sequencing the literature, the Year 2 cohort had more support in this area than the Year 1 cohort. This group had daily support from an experienced researcher, which may be one reason why fewer teachers reported a low level or no difficulty in writing the literature review. The Year 1 cohort also had a more difficult time in sequencing the literature.

One issue that the Year 2 cohort faced that the Year 1 cohort did not face was sharing the load of work and a commitment to the inquiry. The two main issues that surfaced in this area were that all of the teachers were directed to complete the inquiry, and complaints were raised that some of the teachers did not do their part of the work. This is consistent with Garcés and Granada (2016), who reported that working together on tasks of making decisions about carrying out the research and collecting data became problematic. All participants in the Year 1 cohort chose a topic that they were interested in and the inquiry was individually completed. More consideration must be given to whole-school group inquiries where there may be less buy-in than individual research.

Based on the teachers' responses, we offer three recommendations for implementing successful AR as PD in schools.

1. More individual support should be given to the teachers during the AR process. Teachers in this study indicated that completing this project was challenging and somewhat difficult at times. Additionally, the teachers in this study indicated that the three main areas that they had difficulties with are, defining the research question, developing the method and analysing the data.
2. Teachers should be allocated more in-school time to work on classroom-based research. Because of classroom responsibilities and classroom issues faced on a day-to-day basis, many teachers felt that they did not have enough time to work on the study.
3. More research written in Arabic will have to be made available. Arabic speakers indicated that finding research in Arabic that is applicable to their topics was a major obstacle for them in completing their research project.

Limitations

Limitations can be seen as 'an aspect of a study which the researcher knows may negatively affect the results or generalizability of the results, but over which he or she has not control' (Gay & Airasian, 2000, p. 625). One limitation of this study was that seven of the survey responses had to be translated from Arabic to English. The bilingual nature of the responses led us to consider the nuances of language and the importance of appropriate translation for research purposes (Jagosh & Boudreau, 2009). Therefore, some of the respondents' true meanings could have been lost in the translation. Furthermore, the number of participants in and the return rate for each of the two cohorts varied widely and therefore results are not easily comparable. The sample size is also quite small. The nature of the instrument, which was based on self-report, also limits the generalisability of the study's results. The simple statistical analysis also limits interpretation of the results as there is no statistical significance derived from survey responses.

Conclusion

Grundy pointed to debates which place teachers, who function primarily in the microsystem, at the heart of the educational process, and saw this as an 'ideology of individualism which regards the whole as simply the sum of its parts' (1994, p. 24). She referred to the terms 'responsibility' and 'autonomy' and highlighted that while teachers are being held responsible for the success or failure of education reform, for example, autonomy does not seem to be held in such high regard. It is interesting that she pointed to Stenhouse's 1976 research where he highlighted the difficulty of maintaining teacher autonomy in the circumstances of the time, by arguing that two decades later this difficulty is accentuated. Two decades on from Grundy's (1994) article the difficulty may be further accentuated, but in a burgeoning education reform site there may be room to enhance teacher autonomy through appropriate professional development.

Quality educational reform is not dependent upon a particular methodology. Rather, what AR provides is a set of principles for procedure (Grundy, 2004, p. 35). AR is an important core tool that teachers use when making educated and logical decisions. Many of our participants reported that because teachers review professional resources and research findings to develop their own solutions, action researchers become part of the body of research and literature that is vital for student achievement and success. Through the decisions that teachers make through AR, they can become activists for children regarding changes in curriculum and teaching methods.

This study concurs with O'Connor et al.'s findings that action research helps to recognise the significance of the teaching profession (2006). Positive changes can be detected in the language, actions, attitude and classroom management of participants in this study. As members of a community of practice engaged in AR, the interactions of these teachers both with the process and with each other has led to them learning how to engage critically with pedagogy and enhance their practice.

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Appendix A: Overview of inquiry strand 2013-2015

The learning objectives of each individual inquiry (University of Florida, 2012)

| | |
|----------------|---|
| Inquiry One | <ul style="list-style-type: none"> • Understand and begin to develop an inquiry approach teaching practice: learning to teach and teaching to learn. • Analyse the cycle of inquiry and the movement between and within the cycle. • Engage in structured conversations and exercises to come up with reflective questions concerning their teaching practice that are open-ended, personal and within their locus of control. |
| Inquiry Two | <ul style="list-style-type: none"> • Understand and begin to develop an inquiry approach teaching practice: learning to teach and teaching to lead. • Identify the interest that motivated them to become an educator and begin to consider questions regarding that interest. • Engage in structured conversations and exercises to come up with reflective questions concerning their teaching practice that are open-ended, personal and within their locus of control. |
| Inquiry Three | <ul style="list-style-type: none"> • Understand and begin to develop an inquiry approach teaching practice: learning to teach and teaching to learn. • Begin to differentiate between a strong reflective questions and a weak one. • Develop an inquiry question based on individual context. |
| Inquiry Four | <ul style="list-style-type: none"> • Develop an inquiry question (reflective question) based on their own contexts and personal education interest. • Begin to differentiate between a strong reflective question and a weak one. |
| Inquiry Five | <ul style="list-style-type: none"> • Work both individually and in small groups to finalise an inquiry question. • Use the inquiry question guidelines to self-assess the strength of the inquiry question. • Complete the first two sections (“purpose” and “question”) of the inquiry brief. |
| Inquiry Six | <ul style="list-style-type: none"> • Define what is mean by data. • Create the beginnings of a research plan by thinking about the types of information that would be helpful in addressing the inquiry question. • Explore sources of quantitative and qualitative data. |
| Inquiry Seven | <ul style="list-style-type: none"> • Continue with research plan |
| Inquiry Eight | <ul style="list-style-type: none"> • Create an individual timeline of data collection activities. • Define what is meant by data analysis. • Go through the four step data analysis process with a photograph. |
| Inquiry Nine | <ul style="list-style-type: none"> • Articulate the purpose of using protocols to structure discussion. • Use a protocol to examine a student work sample. |
| Inquiry Ten | <ul style="list-style-type: none"> • Address individual tasks involving data collection, planning, and reflection. • Assess and reflect on current levels progress through the inquiry process at the midpoint of the cycle. |
| Inquiry Eleven | <ul style="list-style-type: none"> • Review the four step process of data analysis. • Differentiate strategies for qualitative and quantitative data analysis. • Reflect on individual inquiry project data and prepare for data analysis protocol in Session 12. |

| | |
|------------------|---|
| Inquiry Twelve | <ul style="list-style-type: none"> Participate in data analysis meetings in small groups, in which they will give and receive feedback about the data collected. Reflect on the inquiry process thus far and begin to think about planning for sharing projects. |
| Inquiry Thirteen | <ul style="list-style-type: none"> Reflect on the question, "Why share your inquiry project with others?" Begin the process of compiling a written report based on their inquiry projects. |
| Inquiry Fourteen | <ul style="list-style-type: none"> Use their inquiry brief documents and written reports to prepare to present their projects at the learning showcase. Create a presentation outline and plan <i>PowerPoint</i> slides or other visuals for use during presentation. Begin to practise presentations, either individually or with partners. |
| Symposium | <ul style="list-style-type: none"> Teachers present findings of inquiries. |

Appendix B

Table 1: Perceived level of difficulty: Mean scores for teacher inquiry components

| Inquiry research process stage | Year 1 no. respondents | Year 1 mean | Year 1 SD | Year 2 no. respondents | Year 2 mean | Year 2 SD |
|------------------------------------|------------------------|-------------|-----------|------------------------|-------------|-----------|
| Defining the research question | 6 | 2.83 | n/a | 22 | 2.23 | 1.00 |
| Writing the literature review | 6 | 3 | n/a | 22 | 2.55 | 1.23 |
| Developing and writing methodology | 6 | 2.8 | n/a | 22 | 2.59 | 1.15 |
| Analysing the data | 6 | 2.5 | n/a | 22 | 2.33 | 1.08 |
| Organising and writing findings | 6 | 2.83 | n/a | 22 | 2.32 | 1.22 |

Table 2: Impact action research has on teaching and learning:
Mean scores for teacher inquiry components

| Impact of teacher inquiry on teaching and learning | Year 1 no. respondents | Year 1 mean | Year 1 SD | Year 2 no. respondents | Year 2 mean | Year 2 SD |
|--|------------------------|-------------|-----------|------------------------|-------------|-----------|
| Action research is valuable to the teaching and learning process for me as a teacher | 6 | 3 | n/a | 16 | 2.35 | 0.76 |
| Action research is valuable to the teaching and learning process for my students | 6 | 3 | n/a | 16 | 2.53 | 0.61 |
| The action research positively impacted my student's learning | 6 | 2.33 | n/a | 16 | 2.53 | 0.50 |
| This action research project positively impacted my learning | 6 | 2.83 | n/a | 16 | 2.71 | 0.46 |
| I view myself as a teacher researcher | 6 | 2. | n/a | 16 | 2.21 | 0.99 |

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