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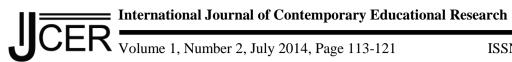
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Investigating the Leadership Practices among Mathematics Teachers: The Immersion Programme

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Abstract

This study examines the leadership practices, through its peer-mentoring programme called the 'Immersion Programme', specifically in a mathematics department in one of the colleges in Brunei Darussalam. The main aim of the programme was to prepare mathematics teachers to teach mathematics lessons effectively in any secondary year levels and at the pre-university levels. Data were collected through open-ended online surveys. This study involved the participation of one organiser, six mentors and three mentees. The qualitative reports indicated that teachers could have interchangeable roles that exhibit leadership qualities in multiple or overlapping ways, such as simultaneously being a mentor as well as a mentee at the same time. This programme helps to provide the mentors and mentees with the opportunity to learn from each other and share ideas and knowledge which are relevant to improving student learning in mathematics. Mentees were receptive to ideas as their main priority was to teach mathematics lessons effectively and in turn, to improve their students' learning outcomes and success. Indirectly, these were their motivation in doing and continuing with the immersion programme. The leadership portrayed in this study strategises the professional learning experience within the context of the college.

Key words: Leadership, Peer-mentoring, Mathematics teachers, Leadership roles

Introduction

In 2009, Brunei Darussalam underwent major changes in the country's general education structure known as the National Education System for the 21st Century or Sistem Pendidikan Negara Abad ke-21 in the Malay Language and better known as the SPN21 (Ministry of Education, 2013). According to the Ministry of Education (2013), one of the rationales for the change is to improve students' achievement primarily on one the core subjects namely English Language, Mathematics and Science. In Brunei, Mathematics has always been one of the subjects that challenge school students at all levels from the primary, secondary and post-secondary levels (Ang & Shahrill, 2014; Daud & Shahrill, 2014; Hamid et al., 2013; Mahadi & Shahrill, 2014; Matzin et al., 2013; Mundia, 2010a, 2010b, 2012; Nor & Shahrill, 2014; Pungut & Shahrill, 2014; Salam & Shahrill, 2014; Sarwadi & Shahrill, 2014; Shahrill, 2009; Shahrill et al., 2013; Shahrill et al., 2014; Wahid & Shahrill, 2014; Yatab & Shahrill, 2014). Therefore, in order to help raise students' students' learning outcomes and success in Mathematics, schools need to have quality Mathematics teachers that are equipped with strong Mathematics subject matter knowledge, especially on the levels that they are teaching (Shahrill, 2009; Shahrill & Clarke, 2014).

In a local news article reported in the Brunei Times during the launch of the book Ministry of Education: The Strategic Plan 2007-2011 by the former Minister of Education, Khairunnisa Ibrahim reported that the Minister highlighted the educational system will be deficient in achieving the objectives outlined in the strategic plan without quality, efficient and effective officers, teachers and staff roles (Ibrahim, 2007). These objectives included improving the teaching and learning effectiveness and to produce effective leaders. Leadership has been defined in many different ways. Yukl (1998) stated "most definitions of leadership reflect the assumption

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that it involves a process whereby intentional influence is exerted by one person over other people to guide, structure and facilitate activities and relationships in a group or organization" (p. 3). According to Shahrill (2014), within the school contexts, the principals and the teachers are responsible in shaping the students' future, and importantly, the school culture and values. As for teachers, an effective leadership is critical for the success of educational organisation.

Meanwhile, Low Leng Mey of the Brunei Times reported that Mr P. Rajoo, a consultant from the PR Quality Management Dynamics, Kuala Lumpur facilitated the Cascading Workshop on the Ministry of Education's 2012-2017 Strategic Plan. Mr Rajoo believed that the plan should be focused on three strategic areas of education: teaching and learning excellence, teachers' professionalism and accountability, and institutional efficiency and innovativeness (Low, 2012). From this workshop, mentoring programmes had been identified as one of the strategies to achieve these objectives.

Shillingstad and colleagues (2014) highlighted the contributions mentor teachers, also known as teacher leaders, have made in the development of beginning teachers' leadership skills. These mentor teachers were seen to have exemplary leadership qualities to their mentees and colleagues. Gallacher (1997) defined mentoring as "a caring and supportive interpersonal relationship between an experienced, more knowledgeable practitioner (mentor) and a less experienced, less knowledgeable individual (protégé or mentee) in which the protégé receives career-related and personal benefits" (pp. 196-197). Typically, mentoring is seen as a senior colleague, categorised as the more experienced, guiding and supporting the junior colleague, the less experienced, as they progressed in their early career teaching profession (Eby & Allen, 1997; Heeralal, 2014).

What Constitutes Good Mentoring?

There are many benefits with having mentoring programmes among the teachers in schools. This includes giving support and guidance to beginner teachers to increase their confidence in the content knowledge and instructional practice (Bodie, 2009), and also to help in their transition to the culture of a new school and environment (Tillman, 2005). Stanulis and Floden (2009) stated that novice teachers without adequate support takes 3 to 7 years of teaching experience in order to reach their maximum impact on student learning. So induction programmes like mentoring are aimed to accelerate this process and minimise the amount of time it takes for a novice teacher to be most effective in promoting student learning.

The significance of conducting mentoring programmes in schools is often associated with improving beginning teachers' personal and professional development, which has significant contribution to students' learning outcomes. However, it was highlighted by Ingersoll and Smith (2004) that induction programmes in schools are designed more "as a bridge from student of teaching to teacher of students" (p. 24), and not as replacements for pre-service or in-service teacher training programmes. However these studies mainly discussed about the mentoring from the perspectives of novice or beginning or early career teachers. Yet, none mentioned what happens to those who are already at the mid-stage or prime stage of their teaching careers. Apart from the many on-going professional development courses or workshops offered by the ministry or educational organisations, where and who they turn to, in their own school settings, when they need support in teaching a new Mathematics topic or topics that they have not taught for a period of time?

Tillman (2005) discussed how mentoring can act as a catalyst for transformative leadership; however she only focused on the leadership role of the principal of the school. Although the mentors and mentees hold more informal leadership roles than the principal, it is worth mentioning that they are also responsible in making the programme a success. Communications between the mentee and the principal, and providing a set of specific strategies for mentoring new teachers were among the few problems being discussed by the mentees in this study. So the importance of having strong leadership in conducting such programmes successfully cannot be understated. Depending on the needs, backgrounds and the experiences of the mentees, there are several mentoring models that may be considered. It takes considerable insight and skill for a leader in an organisation to understand the current culture and implement changes successfully (Yukl, 1998). Orland-Barak and Hasin (2010) investigated five case studies of 'star' or exemplary mentor practices in the contexts of the Israeli school system. These exemplary mentors exhibited characteristics of good mentoring traits such as good organisational skills, establishing and sustaining good interpersonal relationships with colleagues, and their abilities to think, behave and act as leaders.

The investigation in this study examined the leadership practices in the Mathematics department of a college through its mentoring programme called the 'Immersion Programme'. This study aims to investigate the

leadership practices among the Mathematics teachers in the college and their experiences while being involved in the Immersion Programme. The leadership practices will be discussed in the context of the organiser, the mentors and the mentees. Hereafter, we will refer a mentee as the teacher with less experience specifically in a particular Mathematics subject or level, while the more experienced teacher is identified as the mentor. One of the main uniqueness of this programme lies in the fact that the number of years the mentor or the mentee had in their teaching career is not the driving factor how they are chosen in the first place. In fact, mentors are chosen on the basis of their competency in teaching a particular Mathematics topic or area. In other words, even those who are categorised as beginning teachers but competent in teaching, for example, Mechanics, can be a mentor to a more experienced individual but inexperienced in teaching Mechanics.

The Immersion Programme

The Immersion Programme is a peer-mentoring programme that has been carried out for the past three years in one particular college in Brunei. The main aim was to produce competent teachers for any Mathematics levels from Year 7 to pre-University when needed by providing practical initial training for teachers who have just begun teaching a new level, new to a particular branch of Mathematics (such as Pure Mathematics, Statistics or Mechanics) or those who have not been teaching that level or branch of Mathematics for a while.

The idea was that the mentees will not only observe how a more experienced teacher (mentor) conducts their lessons, but the mentor will also be observing how the mentee conducts his or her lessons as well. In the Immersion Programme, the mentees are also involved in the learning experience of the material just like the students in the college, which included having to do all the work being given. Then, the mentor and mentee can set formal or informal sharing sessions, discussions and feedbacks regarding their personal and professional practices and experiences. Specifically, the programme focuses mainly on helping mentees in familiarising themselves with the structure of the curriculum, and increase their confidence in regards to their content knowledge. However, due to the heavy timetable scheduling, only the teachers teaching the pre-University levels were able to participate in the Immersion Programme and some of the mentors were not able to observe the mentees' classes. This was a serious setback in accomplishing their goals and had limited the full effectiveness of the programme.

Methods

Design

The research approach we adopted for this study was a qualitative field survey approach. A qualitative approach was used because we needed to investigate the leadership practices of the Mathematics teachers in the college. Furthermore, our goal also was to learn about the experiences of the organiser, the mentors and the mentees in relation to enhancing the teaching and learning of Mathematics.

Setting

The college is located in the Brunei-Muara district in Brunei. Although the Brunei-Muara district is the smallest district, approximately 570 square kilometres, it is also the most populated amongst the four districts in Brunei. The population of Brunei is less than half a million. With the capital city Bandar Seri Begawan located in the Brunei-Muara district, this is where the largest concentration of primary and secondary schools, colleges and higher institutions in the nation can be found. The college, on the other hand, is a co-educational government institution located about 10 km from the city. This college caters to Year 7 to Year 10, and two years of pre-University levels of secondary schooling.

Participants

As mentioned earlier, only teachers teaching the pre-University levels were able to participate in the Immersion Programme. Thus, this study involved the participation of 1 organiser, 6 mentors and 3 mentees. All participants are female except for one male teacher. The collective range of years these teachers had been teaching Mathematics was between 7 to 27 years. And, their educational qualifications ranged from those with bachelors to master degrees.

Survey Instruments and Data Collection

All the participants who were involved in this study were asked to complete an online survey. Consent forms were also distributed informing them that participation was voluntary and we will not reveal their names in our reports. In reporting our findings, only pseudonyms will be used.

For the survey instruments, three sets of questionnaires were developed specifically targeted to three sampled categories, the organiser, the mentors and the mentees who had participated or are currently participating in the programme, at the time of the study. It is also important to note that we built our survey questions based on the six open-ended survey questions used by Stanulis and Floden (2009) in their study. Provided in Appendix 1 are the questions given to the respondents in our study. We developed the questions in order to extract as much information as we can from the participants in order to help us analyse the collected data qualitatively.

Qualitative Analysis and Results

In total, 10 responses to the online survey were collected. The procedures for analysis of the collected surveys involved reading all the comments of the open-ended questions. We then looked for overall patterns and completed an overall summary of the comments from the participants. During the analysis, we found several findings worth highlighting (note that all names used here are pseudonyms).

Firstly, the programme allowed the participants to have interchangeable roles that exhibited leadership in multiple or overlapping ways. For example, the organiser of the programme is also the head of the Mathematics department. Being the head, Siti had many administrative tasks assigned by the college, but that did not deter her from volunteering in being a mentor. Surprisingly, Siti, who had 11 years of teaching experience, was mentoring a senior colleague (Riaz) who had 27 years of teaching experience. When asked about her expectations prior to entering the programme, Siti wrote, "I was nervous and uncomfortable being observed everyday." However, as time progressed, she reflected on the benefits and wrote, "I'm more used to being observed in class as I have been observed everyday, and I get to share with my colleague strategies and knowledge".

Riaz, whose involvement in the programme as the mentee was voluntary, stated that he chose Siti as her mentor because "she has been teaching Mechanics for quite some time and Mechanics is her field of specialisation". In addition, Riaz planned to teach Mechanics the year after and he needed to "refresh my knowledge in Mechanics because the last time I studied Mechanics was in 1978". Siti (the mentor) and Riaz (the mentee) attended meetings twice a week throughout the academic year. Siti also described her role during the meetings with her mentee as "to guide my mentee throughout the programme, in and outside class, to answer my uncertainties from my mentee, and to treat my mentee just like I treat any student in class". Riaz also volunteered to be a mentor to another Mathematics colleague. He was not the only teacher who did so. There were two other Mathematics teachers, Yuli and Yasmin, who also have interchangeable roles in being a mentor as well as a mentee at the same time.

The second finding worth highlighting was that not all participation in the programme was voluntary. Yuli's participation as a mentor and a mentee was not voluntary. She also stated that when she was a mentee, her mentor was chosen for her. However, she wrote several benefits in her participation such as learning new methods of teaching and observing how her mentor communicated with the students. Yuli added that the drawback in participating in the programme as a mentee, "not every teacher is willing to let you observe their lessons".

The third finding is on the level of confidence that Yasmin and Riaz reported from the perspective of their involvement in being mentees. Yasmin wrote, "It would help me gain confidence in the delivering the appropriate content," whereas Riaz saw the benefit in having "more confidence in teaching the subject matter". To possess confidence was anticipated by Siti when she was asked to describe the benefits of participating in the Immersion Programme,

Mentors get to be more confident as they are being observed everyday. Mentors also get to be more conscientious when teaching. For mentee, it helps them to prepare for their own class and anticipate problems that they themselves may face in during the same lesson.

Furthermore, Siti, who should be acknowledged in initiating this programme, also added the improvements she expected to see in the school after introducing the programme, "I expect teachers to be more confident in teaching, be more knowledgeable and be more aware of what they teach in their classroom."

Discussion

The discussions presented below will be based on the leadership roles of the respective sampled categories involved in the Immersion Programme.

Leadership Role of the Organiser

Siti, who was the head of the Mathematics department, realised the need to produce Mathematics teachers who are competent in teaching any year level, from Year 7 to pre-University, when needed. She felt that simple observations of lessons without any proper interventions from a more experienced teacher would not provide sufficient help for the mentee teachers to improve their professional and personal competence, so she articulated a clear plan to achieve this objective by introducing the Immersion Programme. Here, Siti had the chance to lead the Mathematics department in transformative ways where she offered support and guidance for the teachers to increase the efficacy of the department. Also, she attempted to develop a relation-oriented leadership style in conducting this programme, where she considered the skill levels, experience and level of confidence in a particular subject when choosing the mentors.

Her role in this programme focuses on a collaborative style of leadership, as she also participated in being a mentor and also monitors the progress of the mentees through discussions regarding their personal and professional development. She uses this as a platform to show her colleagues what is expected from a mentormentee relationship in order to maximise the teachers' learning experience in this programme. In this way, she also helped other teachers to develop their own leadership skills that are relevant in improving the teaching and learning of Mathematics in the college. Hence this programme provided the head of the Mathematics department an opportunity to go beyond being an instructional leader as the organiser to a more transformative and collaborative leader.

Siti also mentioned her intention to share this programme with the whole school so that other departments may benefit from the mentoring programme as well. This shows her vision as a teacher leader to help transform the whole school in improving the teaching quality and students' learning outcomes in all of the subjects.

Leadership Role of the Mentors

Leadership practiced by the mentors of this programme focuses on being the role model for the mentees to inspire and motivate the mentees who are faced with the challenges of teaching the Mathematics subject in their year level. Mentors who volunteered in this programme realised their responsibility to provide support and guidance in helping other teachers in any way they can. Mentors who participated in this study reported mostly on helping mentees on familiarising themselves with the content of the subject by informing certain components that needs highlighting and emphasising, and also the areas where students mostly have difficulties in. In doing so, mentors are able to ensure consistency in the curriculum implemented in the school by helping mentees to understand the curriculum and use it to plan instruction and assessment in their own classroom.

This programme helped to provide the mentor and mentees with the opportunity to learn from each other and share ideas and knowledge, which are relevant to improving student learning in mathematics. Mentors advised beginning teachers with different ways of approaching a particular concept to help in exploring and implementing effective teaching strategies. Although some of the mentors participating in this study admitted that having their peers to observe their teaching had made them nervous and uncomfortable, they also realised that this has helped them to be more confident and conscientious when teaching.

Leadership Role of the Mentees

From the results of the study, the mentees were responsible for realising and acknowledging their roles as a teacher and a leader for their students. Their involvement in the Immersion Programme was voluntary because they felt the need to be confident in teaching new levels or branches of Mathematics, improve on their content knowledge and to be able to deliver the appropriate curriculum. They were sincere and had a sense of selfawareness of what they were lacking whereby they wanted to change and improve on themselves first (personal professionalism) before they wanted to improve the students. They were also very committed in attending their mentor's classes throughout the academic school year.

Mentees have a big role in the Immersion Programme because they are the ones needed to be proactive. They were expected to not only initiate discussions and ask for feedback from the mentor but to also be respectful and open-minded in accepting and considering all the criticisms, advices and suggestions given to them. It is worthwhile to highlight the mentees' willingness to learn from their mentor regardless of their years of teaching experience or age differences. They were humble as their main priority was to improve the students' learning outcomes and achievements. Indirectly, this was their motivation in participating and continuing with the Immersion Programme.

Mentees have the experience of learning the materials similar to students when observing their mentor's class, so they were expected to be punctual, disciplined and professional in terms of completing their work and their performance in tests. Furthermore, since they became students themselves, it eliminated the feeling of being disconnected with their own students and had more understanding to the class environment. Being able to observe a more experienced teacher had helped the mentees to be more confident, understand the subject matter better and have a more organised and structured curriculum for teaching their students. To be a great leader, you must first become a great follower. Mentees must possess the characters of being a great follower of the mentor in order to be able to be the great teacher leader of their own classrooms.

Conclusions

The qualitative reports indicated that teachers can have interchangeable roles that exhibit leadership qualities in multiple or overlapping ways, such as being a leader to their own students and colleagues, and at the same time, handling the many administrative roles tasked by the college. This programme helped to provide the mentors and mentees with the opportunity to learn from each other and share ideas and knowledge, which are relevant to improving student learning in mathematics. It is worthwhile to highlight the mentees' willingness to learn from their mentors regardless of the number of years of teaching experience possessed by the mentors or in terms of their age differences. Mentees were receptive to ideas as their main priority was to teach mathematics lessons effectively and in turn, to improve their students' learning outcomes and achievements. Indirectly, these were their motivation in doing and continuing with the immersion program. The leadership portrayed in this study strategises the professional learning experience within the context of the college.

The findings regarding the organiser and the mentors exhibiting leadership characteristic traits that we have reported here resonates to some extent to the cases of exemplary mentoring practices reported by Orland-Barak and Hasin (2010). Regardless of the roles they assume, teacher leaders will shape the schools or colleges in terms of improving the students' learning, and influencing practice among their peers (Shahrill, 2014). Mentioned earlier are just some of the uniqueness or the distinctive features that we can summarise from the Immersion Programme; a mathematics teacher can be a mentee despite the teachers' age or seniority, and the mentee experience life as a 'student', to sit in the class with the actual students, doing the same classwork and homework exercises; and it is the only department in the college conducting this type of mentoring programme.

The Immersion Programme is an innovative approach to provide teaching and learning excellence. As was mentioned earlier regarding the article reported by Low Leng Mey of the Brunei Times (Low, 2012), we may have identified a mentoring programme that is in line with the 2012-2017 strategic plan of the Ministry of Education in Brunei. Other departments in the college, and other schools and colleges in the nation should also implement mentoring programmes such as this. It should be inclusive of teachers from all backgrounds and levels of experience, and not only limited to teachers who are new to teaching a particular level. Teachers have various styles of teaching and there is always something that can be learnt from one another. In the speech prepared by John F. Kennedy, he stated, "leadership and learning are indispensable to each other". This intrinsic relationship between leadership and learning is vital to not just for student learning but also for developing the skills and abilities of future generations of leaders.

The findings shared in this study may have implications for educational practice. In developing teacher education programmes, previous studies (such as Bodie, 2005; Ingersoll & Smith, 2004; Stanulis & Floden, 2009; Shillingstad et al., 2014) typically discussed about mentoring beginning/novice/early career teachers by more experienced teachers. However, as far as is known, not many discussed about mentoring those who are

considered to be at the mid career stage or even at the prime stage of their careers. Perhaps, the leadership and relationship approaches entailed in the Immersion Programme may be taken as one of the exemplary mentoring practice that needs to be shared. As stated by Shahrill and Clarke (2014), "It is through first recognising distinctive features of local pedagogies and then connecting these to learning outcomes that research is likely to inform teacher education and increase the effectiveness of classroom practice" (p. 13). This study has tentatively identified some of the distinctive features of mentoring practices in Brunei, particularly in relation to exhibiting leadership qualities of a teacher tasked as the organiser or the mentor. Several avenues for further research are suggested by the findings. In particular, further investigation on the contribution and impact of the mentoring practices on students' learning.

Limitations of the Study

The present study has two main limitations. Firstly, this study was limited to only one selected college in Brunei. It is not known whether other schools or colleges have similar mentoring practices as portrayed in this study because as far as is known, none has ever been reported. Moreover, caution should be taken when interpreting the findings to this particular college only. Secondly, although the results shown here are mainly positive, there is more to be learned about the quality of the Immersion Programme. The programme itself had several setbacks that limited its full effectiveness, thus further development needs to be done to monitor the progress after the initial implementation.

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Appendix 1

		participants	

Organiser	Mentor	Mentee		
• What initiated the department to introduce this programme for the staffs?	Please indicate the year level you were teaching during the Immersion Programme.	Please indicate the year level you were teaching prior to doing the Immersion Programme and the year level you were observing during the programme.		
• What is the purpose/ objective of the Immersion Programme?	• Is/ Was your involvement in the Immersion Programme as a mentor voluntary. If so, why did you choose to participate in the Immersion Programme?	• Is/ Was your involvement in this programme voluntary? If so, why did you choose to participate in the Immersion Programme?		
• Describe your role as the organiser in this programme.	• What was your expectation prior to entering the programme?	 What was your expectation of the programme prior to your involvement? 		
 Are any of the other departments in this school doing similar programme? 	• Describe your role during your meetings with your mentee?	 How and why did you choose your mentor? 		
• Is the Immersion Programme only essential to teachers teaching a new level in the mathematics department?	What did you discuss about while leading your mentee? (e.g. application of effective instructional techniques in a Mathematics topic, classroom management and discipline, and student achievement, communicating with parents, content knowledge etc.)	 How many meetings with your mentor have you attended during the programme? 		
• How are the mentors chosen?	 How many meetings with your mentee have you attended throughout the mentoring process? 	 Describe the benefits and drawbacks (if any) of participating in the Immersion Programme. 		
• What is expected from the mentormentee relationships?	 What specific activities were you involved in with your mentor during your individual meetings (e.g., observations and feedback, co-planning etc.)? 	 What specific activities were you involved in with your mentor during your meetings (e.g., observations and feedback, co- planning etc.)? 		
 How long does the mentoring process usually take? 	• Describe the benefits and drawbacks (if any) of being the mentor in this programme.	 What was/ is the main challenge that you were/ are facing while doing the Immersion Programme? 		
 How often do the mentors and mentees usually meet for discussions throughout this programme? 	 How important do you think for new Mathematics teachers to be involved in the Immersion Programme? 	Describe what you wish you could have learned from your mentor that you did not learn.		
 Describe the benefits (if any) of participating in the Immersion programme. 	 Describe whether you were able to have open and candid conversations with your mentee and why (or why not). 	 Describe whether you were able to have open and candid conversations with your mentor and why (or why not). 		
 What are the challenges and limitations of carrying out this programme? 	• What changes would you make about the programme?	• What changes would you make about the programme?		
What improvement did you expect	Optional:			
to see in the school after you	• Please indicate your year of experience as a teacher.			
introduced this programme?	Please indicate your academic background.Please indicate your current role in school.			
• Have your objectives been achieved so far?	• Flease mulcate you	i current foie in school.		