Action Research

in Abu Dhabi III

CFBT Action Research Team

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Welcome to CfBT Education Trust

CfBT Education Trust is a top 50 charity providing education services for public benefit in the UK and internationally. Established over 40 years ago, CfBT Education Trust now has an annual turnover exceeding £100 million and employs 2,000 staff worldwide who support educational reform, teach, advise, research and train.

Since we were founded, we have worked in more than 40 countries around the world. Our work involves teacher and leadership training, curriculum design and school improvement services. The majority of staff provide services direct to learners: in nurseries, schools and academies; in advice and guidance centres for young people; through projects for excluded pupils; and in young offender institutions.

We have worked successfully to implement reform programmes for governments throughout the world. Government clients in the UK include the Department for Education, the Office for Standards in Education (Ofsted), and local authorities. Internationally, we work with education ministries and their equivalents in Dubai, Abu Dhabi and Singapore among many others.

Surpluses generated by our operations are reinvested in educational research and development. Our research programme – Evidence for Education – aims to improve educational practice on the ground and widen access to research in the UK and overseas.

Acknowledgments

This book is a compilation of snapshots of all the Action Research projects that were completed through the CfBT PPP projects in Abu Dhabi in the Cycle 2 and Cycle 3 schools in the 2011-12 academic year. Each research project is sizable and includes data, images and additional information. Due to the volume of each project, projects have been compressed to create the following snapshots.

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Foreword from CfBT Education Trust

Tony McAleavy, Education Director, CfBT Education Trust

Tony McAleavy,
Education Director,
CfBT Education Trust

I am delighted to introduce this third volume of action research case studies, developed by CfBT Education Trust in partnership with ADEC, and undertaken in Abu Dhabi public schools. The word 'partnership' is especially relevant in this context, because the authorship of these reports is shared between teachers in Abu Dhabi schools and the CfBT staff who have been working alongside them as coaches and mentors. The teachers and other staff who have produced these action research case studies deserve great praise for the quality of their research and they provide an excellent example of high order professionalism. The authors have created practical knowledge that has been tried and tested in the classroom that can now be shared in order to improve the practice of others.

A focus on improved professionalism through action research has been an important part of our work in Abu Dhabi in recent years. In education, as in so many other fields, Abu Dhabi has embarked on a remarkable, transformational journey. Through our partnership with ADEC, CfBT Education Trust has had the privilege of contributing to government school improvement, since 2006. One important feature of our approach has been to emphasise the importance of evidence and research engagement. Across the world, the key to better learning outcomes is better teaching. The mark of a respected profession is that professional practice is evidence-based and reflective. It is inconceivable, for example, to imagine good practice in medicine, law, engineering or architecture that was not based on the best science and the best research. And yet teaching is not always seen in the same way. The challenge in many government school systems worldwide is to make teaching an equally respected profession, with practitioners who take seriously their craft and are constantly seeking to find ways of improving their teaching. These case studies show how it can be done. Although the case studies are extremely varied, all are linked by a focus on the measurement of impact and the improvement of learning outcomes for young people. I hope that teachers who read this volume will not only learn from the action research findings but also be inspired to improve their own teaching through action research.

Masood Abdulla Badri, Professor and Head of Research, Planning and Performance Management, Abu Dhabi Education Council

Foreword from Abu Dhabi Education Council

Masood Abdulla Badri, Professor and Head of Research, Planning and Performance Management, Abu Dhabi Education Council

I am delighted that CfBT has continued to drive educators as action researchers which has resulted in this, the publication Action Research in Abu Dhabi 111. I use the term educators to include all involved in the process of supporting our young people learn. I trust that readers will find these research accounts both inspiring and valuable. Each is the result of both practical and purposeful levels of collaboration amongst Principals, school teachers, students and their parents, all with a shared intent to improve the quality of provision in lessons and schools towards the ADEC Education Strategic Plan.

At the Bedeya Forum, the ADEC 's launch of academic year 2011/12, in the presence of HE Humid Al Qatami, Minister of Education, HE Dr. Mugheer Khamis Al Khaili, the Director General urged all 'within education to work together to address the challenges and improve the Education system in the Emirate to reach international levels.'. To this end, I draw the reader's attention to the professional curiosity of action researchers and the range and relevance of topics each has elected to explore.

The selection covers topics mirrored closely to the ADEC New School Model (NSM) agenda, on issues surrounding developing literacy skills in Arabic and English as well as the major topic around inclusion.

In all cases, it is evident that this year's NSM focus on the development of continuous assessment of seven key learning skills has influenced the action researchers in English Ecart and Mathematics – open-ended Science and Process Orientated Guided Inquiry Learning (POGIL).

Readers interested in IT and effective application in the classroom will be able to look at the influence of plenaries in IT lessons, how audio technology support speaking and listening and the positive impacts of the use of ICT-based simulation and modelling software.

I would like to thank CfBT and the Principals who have sponsored and fostered a spirit of enquiry in their schools. I underscore that this method involves all stakeholders and in particular, students and is something we would encourage all educators to participate if they wish to deepen their professional practice. This approach aligns with our aspiration to continue to grow a reflective knowledge sharing profession in our journey to develop a world-class education

to the students of the Abu Dhabi Emirate.

Introduction

This is the third edition of Action Research in Abu Dhabi. The quality and the quantity of the research presented in this book is testament to the increasing use of action research as a method for reflection and development amongst the teachers and schools of Abu Dhabi. As in previous editions of Action Research in Abu Dhabi, the following chapters have all been written by teachers. In total, there are six schools represented:

Palestine School (Girls)

Palestine School is a Cycle 3 girls' public school with 476 students on roll. Palestine School is one of the oldest secondary schools in Abu Dhabi and it is famous for the high marks that its students achieve, so there is a lot of pressure on teachers and students alike for the students to achieve good results. The students at Palestine School have many different nationalities and most of them plan to continue their education at university level in their home countries.

Al Thoraya School 6 -9 (Girls)

Al Thoraya 6-9 Girls School is a government maintained school that caters for 254 students. The school is situated in the Al Bateen area in Abu Dhabi. Most of the students who attend the school are Emirati nationals and live in the catchment area around the school. The Arabic department consists of six Arabic teachers. The school is in its second year of PPP development in the Abu Dhabi Educational Reform.

Khalifa Bin Zayed Secondary School (Boys)

Khalifa Bin Zayed Secondary School (KBZ) is a boys' Grade 10–12 school located in the Al-Mushrif area of Abu Dhabi. The student population comprises of 426 students both Emirati and expatriate students, with Emiratis making up 45 per cent of the total students. There are 30 teachers, of which eight teachers teach English Language, seven of whom are English Medium Teachers (EMT) from the UK, USA and Canada.

Um Ammar Secondary School (Girls)

Um Ammar (Grade 10-12) is one of the first, and therefore oldest public girls' schools in Abu Dhabi. The school had its first graduating class in 1971 with four students and this year's graduating class has 160 students with a current school role of 415. Um Ammar has a reputation for high standards and very good relationships between school staff and parents. It is held in high regard within the local community. Um Ammar has 17 different nationalities on the school role including students from the UAE, Philippines, Bulgaria, Iraq, Morocco and Sudan. Eight of the teachers were also students at Um Ammar. Um Ammar has been part of the Public Private Partnership for three years.

Al Qadisiya School (Girls)

Al Qadisiya School is a Cycle 3, Grade 10-12 girls' high school, located in Abu Dhabi city. There are 438 students on role, 49% of whom are Emirati, there are also students from other Middle Eastern countries. The school caters for grades 10, 11 and 12; all students are fluent in Arabic and have at least basic English language skills. Teaching staff at Al Qadisiya School have either Arabic or English as their first language, 40% of the teaching staff are Emirati. The school is in its fourth year as a cycle 3 PPP school in the Abu Dhabi 2030 educational reform project.

Abu Dhabi Secondary School (Boys)

Abu Dhabi Secondary School is a boy's Grade 10, 11 and 12 government school located on the main island of Abu Dhabi. The school comprises a total of 522 students of whom approximately 40 per cent are Emiratis and the remainder originates from the MENA region. The school's 45 teachers are from the MENA region plus six English Medium Teachers (EMTs) who are western expatriates and three Emirati teachers. School management is Emirati. The students are fluent in Arabic with English as their second language.

About the reports

The research this year covered four key themes – literacy; pedagogy; school organisation; and Process Oriented Guided Inquiry Learning (POGIL) and Arabic Continuous Assessment Rich Tasks (ACART[1]). Many of the research reports presented in this book document interventions that have been trialled in Abu Dhabi schools, such as the 'flash literacy' programme documented in chapter three, the introduction of interactive plenaries as described in chapter one, or the creative ways to improve student behaviour described in chapter four. By measuring a situation before and after a new intervention is introduced, teachers are able not only to prove 'what works' but to share their ideas with others and continually refine and adapt their plans. Much of the research documented this year uses changes made by the Abu Dhabi Education Council (ADEC) as a basis for investigations, in particular, the introduction of POGIL and ACART provided a rich area in which to conduct action research.

In chapter one, there are six reports looking at different aspect of pedagogy. A team from Palestine School test the impact of introducing interactive plenaries in ICT lessons and Ron Scott from Khalifa bin Zayed (KBZ) Boys' School measures the amount of teacher talk and student interactions in the classroom. A team from Al Qadisiya School look at increasing the use of open-ended tasks; and a team from KBZ evaluate the use of ICT-based simulation and modelling software in science lessons. Aisha Al Salami and Mona Al Saadi from Palestine School investigate the dynamics of group work, as does Martina Dickson, Wafa Abdulmunem, and Mona Mohammed Al Hammady, also from Palestine School.

In chapter two, there are four reports which all look at aspects of the new Process Oriented Guided Inquiry Learning (POGIL) and Arabic Continuous Assessment Rich Tasks (ACART). A team from Al Qadisiya School document the introduction of Process Orientated Guided Inquiry Learning (POGIL) in their school; as does Balqees Mohammed from Palestine School. Fatima Al Ebri, Nadia Wishah, and Mahmoud Wishah look at the introduction of ACART at two schools – Al Jalil Al Faheem and A Thoraya; and Anda Lucia and Banan Al Qawasmi investigate how changes, such as POGIL, are perceived by students and their parents.

In chapter three, there are four reports investigating literacy. Alexandra Limon and Asia Omar Naser investigate what can be done to help students who have difficulties with literacy; a team from Palestine School report the findings of a literacy intervention that they call 'flash literacy'; Montaha Al Zaghal and Nijoud Al Musafaah look at why are students unwilling to read in Arabic; and Mahmoud Wishah and Mohammad Alzaidi investigate using audio technology to improve speaking and listening.

In chapter four, there are three reports all in the area of school organisation. Mariam Al Tiniji and Katie Zawaideh trial a range of creative ways to improve student behaviour such as changing

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(1) ACART has now been renamed 'Tama'an', however at the time the research was conducted it was known as ACART and will therefore be referred to by this name for the remainder of this publication.

classroom displays; Nabil Al Shaalan and Arne Bergh report the findings of a survey they conducted looking at views of effective school practice; and Wafa Al Ansary and Anda Lucia review the impact of a student data tracking system on their departmental.

In each report, the teachers explain:

• The background to the research topic each chose and the reason they chose it;

• The methodology that they selected;

• The findings from their project; and

• Conclusions and reflections on what was learnt and what might happen next.

1- Pedagogy

1.1 The impact of interactive plenaries in ICT lessons on student

knowledge retention and lesson dynamics

Fatema Fragallah, Rehab Maarouf and Eliz Dadson

ICT lessons at Palestine School provide students the opportunity to explore and acquire new software skills. Students work on practical projects where they apply their knowledge in a given area to create a product. The product could be a poster, PowerPoint presentation, movie or leaflet. Lesson time is often under pressure as students try to complete work in the lesson to achieve the learning objectives. The review of taught material and new skills can often be rushed or sacrificed for taking in student work. The end of the lessons especially can be wasted on submission and collection of student work at the expense of consolidation of student knowledge in a controlled and orderly fashion. It can be very difficult for the teacher to manage the end of the lesson smoothly where all students are focussed and engaged till the bell goes.

To address this and maximise lesson time, this research project sought to find out if a controlled and content focussed exit from the class can be achieved by using interactive plenaries. This research is important so that learning time can be maximised.

Research aims

The research looked at the impact of structured plenaries on classroom management, and on students' knowledge retention, and student behaviour. In addition, the plenaries will be assessed as they are introduced and see which ones the students prefer and which they select as the best for aiding their learning. Specifically, the research aimed to investigate the impact of interactive plenaries on student knowledge and how the plenaries affected student behaviour.

In order to meet these research aims, the following questions were addressed:

RQ1.   Does the introduction of a structured plenary improve student knowledge?

RQ2.   Does the introduction of a structured plenary improve student behaviour and engagement with lessons?

Methodology

The research used a pre- and post-survey of students, lesson observations and focus group discussions. In total, 60 students and two teachers took part in the study. Two classes (one Grade 10 and one Grade 11) with 30 students each were identified. The plenaries were monitored for four consecutive lessons for each class meaning eight lessons in total were observed.

Online surveys were used to capture the data from the students. The survey was administered twice, one before the introduction of the plenaries, and the other after the fourth lesson.

During each lesson a new structured and interactive plenary was introduced and its impact observed using pre-agreed criteria on student knowledge retention and behaviour, lesson planning and structure and teacher lesson management. This was further analysed for trends.

Interviews were also used to capture additional views from a focus group. Two girls were randomly chosen from the class at the end of each lesson to take part in a focus group discussion. The discussions lasted no more than 20 minutes and involved a series of structured questions about the lesson and the plenary used on the day. Students were encouraged to reflect on their own knowledge retention and level of engagement and behaviour during the lesson.

Key findings

The surveys were accessed by pupils via a website. There were 60 pupils in the target classes. All pupils were surveyed twice in a pre and post intervention survey. Responses were received from 47 students for the pre-intervention survey (a return rate of 78 per cent) and 45 students for the post-intervention survey (a return of 75 per cent).

It was found that student knowledge, understanding and awareness of the main parts of a lesson increased after the introduction of the interactive plenaries. For example, 30 per cent more students noticed that the teacher wrote the objectives of the lesson on the board after the intervention. Furthermore, the level of focus at the start of the lesson improved by 20 per cent after the intervention, although it remained the same at the end of the lesson.

Following the intervention, student behaviour improved at the start of lessons. It was found that students were more focussed, interested and reported enjoying the lesson. Fewer students arrived to lessons late. However, there was still a minority of students - around ten per cent – who did not appear to be listening to the teacher attentively of respectfully. Student behaviour also improved at the end of lessons. Following the intervention, all behaviour being assessed improved marginally except for listening attentively and talking about the task but the margins are so small they have a negligible impact on the results.

The lessons observed revealed that with every intervention over the four weeks, student knowledge improved and the level of engagement and behaviour also improved. The teachers' lessons are very carefully planned now.

A teacher commented:

> 'the plenaries improved my time management during lessons over the four week period. I had to dedicate at least ten minutes at the end of each lesson to accommodate the plenary and still cover all parts of the lesson'.

When interviewed about her reflections on this research she continued:

> 'The plenary created a system for the students so this improved the whole class dynamics. This action research has made sure I will concentrate on using plenaries every lesson because it improved the students understanding and gave me the chance to be sure that they did understand what I taught them".

Another teacher commented:

> 'I found using these four plenaries very interesting. The students engaged with the lesson more and this was a fun way of learning. At the end of the lesson, they achieved the learning objectives and I will keep using these plenaries in lessons. I will also try new plenaries that suit the lesson content. Taking part in this action research has made sure I manage my lesson timings better and the students know also know the three part lesson structure'.

Conclusion

The research results suggest that the introduction of plenaries increased the level of student engagement and raised levels of student behaviour, both at the start and end of lessons. The four plenaries introduced had a very positive impact overall, on the students, the classroom dynamics and the teachers approach to lessons.

1.2 Teacher talk and student interactions in the classroom

Ron Scott

As part of the change to effective teaching and learning practice, teachers in Abu Dhabi have been encouraged to talk less and to be more student-centred in their approach to planning and delivering lessons. This means less teacher talk and more student activity; less teacher telling and more student thinking.

Research aims

This research project aimed to support the above approach at Khalifa bin Zayed (KBZ) Boys' Secondary School in Abu Dhabi. The research had the following aims:

- To quantify the amount and type of teacher talk

- To quantify the amount and type of student talk

- To develop a feedback tool to assist teachers self-review the effectiveness of their lessons with the aim of reducing teacher talk time where necessary and increase student to student interactions.

In order to meet these research aims the following research questions were addressed:

RQ1   What are the predominant interactions occurring in the classroom?

RQ2   Does the amount of teacher talk to the whole class change as a result of teacher self-review?

Methodology

Primary quantitative data was collected by lesson observations of all teachers within the Mathematics, Science, English and Arabic departments. Data was collected on a data gathering form during lesson observations. The data gathering form recorded the type of teacher-talk and corresponding student interactions at 30 second intervals for the first forty minutes of the lesson. Data was processed by quantifying the types of interaction for each individual teacher, each department and for the school as a whole.

Following this data collection exercise, an intervention was devised whereby the mathematics department engaged in ongoing professional development sessions relating to teacher talk in the classroom and strategies to enhance student centred lessons. Individual mentoring meetings were conducted with teachers. These focused on assisting them to interpret the data gathered and to get them to suggest improvements or changes

that would reduce the amount of teacher talk.

The following questions were used to assist the process teachers' self-review:

- How long did I talk for during the lesson?
- Who was the talk mainly directed to?
- What was the pattern of teacher talk to the whole class?
- What was the class doing during teacher talk to the whole class?
- What is happening during no teacher talk times?
- What do the results tell you about the "style" of the lesson?
- What do the results tell you about management of student behaviour?
- Can you see any broad differences between the start, middle and end of the lesson?
- Are different stages or phases obvious?
- What changes would you suggest to improve the lesson?

Key findings

Significant differences in teacher talk and student interactions were found within and between departments.

Results from the mathematics teachers show some significant changes after ongoing professional development. There was a 16 per cent decrease in the amount of teacher talk to the whole class and a 30 per cent increase in the amount of talk to individuals or groups. The most dramatic change is indicated by a 71 per cent increase in the amount of time students were engaged in 'on-task' group talk.

Teacher comments demonstrated an awareness of the need to have students engaged in activities which require extended periods of thinking as opposed to extended periods of teacher talking. Responses to questions asked in individual interviews indicated that whilst teachers thought the data form was useful to them personally, it would be even more useful for beginning or struggling teachers. They believed it would be most helpful in identifying areas of poor teaching practice or poor management of student behaviour.

Conclusion

At the beginning of this research project the aim was to gather data to show the effect of teacher professional development on the total amount of teacher talk in the classroom. The assumption was that the move from teacher directed lessons to student centred lessons would result in a decrease in the amount of teacher talk to the whole class. The results show that this did occur.

However, the greatest benefit from the project was the discussion that was generated by analysing the data from various classes. Teachers could see patterns that were clearly visible on the data of a well run student centred lessons. This helped them when it came to planning their own lessons.

There has been no attempt to quantify how much teacher talk to the whole class is good or bad. The real benefit has been the fact that teachers are self-reflecting on the quality of their lessons by looking at what the students are doing as well as what they are doing. That is, they are becoming more student-centred in their approach to teaching.

1.3 Teaching mathematics through open-ended tasks

Khawla Al Obaidly and Patricia Tunnicliffe

Mathematics assessment provides a mark made up of a combination of continual assessment and examination or ADEC set task. The continuous assessment component comprises a mixture of tests, investigations and explorations with no one component making up more than 50 per cent of the mark. Initially, teaching was primarily didactic with a heavy focus of assessment based on traditional recall tests. Investigations and explorations were often avoided as a teaching method throughout the earlier stages of the project.

The experience of open-ended tasks for many of the students has usually been limited and their perception of such tasks is for assessment purposes only. Students do not necessarily understand the benefits of learning through open-ended tasks and there has been a reluctance to engage in such methods, believing that real learning will not take place because they are not given a formula followed by some examples and then an exercise of identical type questions.

In September 2011 ADEC made significant changes to its assessment procedures. Firstly, all assessments were to assess the development of skills of the students, namely: remembering, understanding and analysing, creating, evaluating and reflecting, handling and researching, inquiring and experimenting and participating. Different rubrics were devised for tests, investigations and explorations to enable this to happen. Secondly, there was to be an emphasis on students learning through open-ended tasks.

Research aims

The aim of this research was to investigate ways of teaching mathematics through open-ended tasks and the impact that this might have on students' attitudes and student learning at Al Qadisiya School.

In order to achieve this research aim, the following research questions were investigated:

RQ1 How important is discussion in the development of mathematics?

RQ2 How will students respond to a different style of teaching and learning?

RQ3 How can student perceptions of assessment be changed?

Methodology

The research used student survey and interview data as well student marks in assessment and observations. The two science stream classes from grade 11 were used throughout the research. Both classes were taught by the same teacher, who used the same ideas adapted to the learning needs of each class.

Students were given a questionnaire at the onset of the research that asked about the type of mathematical activities they preferred. They were also asked to describe their ideal mathematics lesson. This same survey was given to both classes at the end of the research.

At the beginning of the project, one focus group from each class was asked about their thoughts on open-ended tasks and learning. The questioning here asked them to reflect on what they had done in two contrasting lessons – one as teacher led and one as an investigation. In the middle of the project the same student groups were asked the same question. At the conclusion of the project four groups of students were interviewed in each class and asked about their learning over the research period, their thoughts on open-ended tasks and the way they learned.

Two lesson observations of each class took place throughout the research period, the purpose of which was to note the way the students engaged with their learning. One lesson observation also took the students out of their usual teaching environment into a science laboratory with a cross curricula (mathematics and science) theme where they performed experiments.

Key findings

The initial student survey asked the girls to rank six aspects of mathematics lessons. The findings showed that the students believed mathematics lessons should comprise of teacher talk, copying from the board and answering questions from a worksheet. The observations revealed that many students wanted a 'step by step' approach and needed constant reassurance from the teacher.

Following the intervention, students relied less on the teacher and their opinions of active learning methods had changed. The observations showed students looking up information rather than asking obvious questions and making connections between different mathematical areas. The students started to realise that listening to each other was a valuable learning process and that it did not only have to be the teacher talking:

'The part of maths we enjoy most is when we work together as groups. It gives us confidence'

'We love investigating and exploring and when the teacher gives us tips and advice'

'We enjoy discussing the maths because we all do not think in the same way'

'We enjoy discussing and finding out together because we learn more and remember the maths better.'

'The best way to learn is by discussing the problem with each other'

Initially, the students needed a lot of guidance and always seemed to hit obstacles but over time they became more and more confident and in doing so started to have more in-depth mathematical discussions.

Conclusion

In the course of this research, the attitude of the students towards open-ended tasks has changed dramatically. The discussion in the classroom has become lively and all about mathematics. The confidence of the students is growing and they believe in their own understanding. The students now understand that positive learning is taking place and value the benefits of investigations and explorations. Students are eager to have assessments as group explorations because they feel it is a continuum of learning mathematics and is non-threatening. To sum up, one student on her second survey said:

> 'My favourite mathematics lesson now is when the teacher gives us an investigation so we can find out the result at the end. Now I memorise that lesson more. I love when the teacher gives us some hard/smart questions or riddles to try solving and I love the creative ideas from learning'

1.4 The impact of self-selected groups on student performance in chemistry lessons

Aisha Al Salami and Mona Al Saadi supported by Fiona Victory

This project assesses the impact on learning in chemistry lessons when students self-select the groups that they work in. This area is important to the work of the Palestine School chemistry teachers because this year ADEC has recommended that all chemistry lessons be taught using the Process Oriented Guided Inquiry Learning (POGIL) method. In this method students work independently, in small groups of three or four students, to complete well structured guided inquiry activities. The POGIL method recommends that students should choose their own groups in order to encourage teamwork and responsibility. At Palestine School the students are already used to learning chemistry in groups but in the past these groups have always been selected by the chemistry teachers.

Chemistry is a compulsory subject for all grade 10 students at Palestine School and for grade 11 and 12 students in the science stream. Traditionally in Abu Dhabi, chemistry has been taught in a teacher-centred classroom with an emphasis on rote learning and memorisation rather than understanding. Through involvement in the public private partnership (PPP) project the science teachers at Palestine School have moved towards a more student centred style of learning. In many ways the POGIL style of teaching is an extension of the teaching and learning changes which have already been taking place in Palestine School. A difference in the POGIL approach to teaching is that students are allowed to choose their own groups to work in, rather than having them selected for them by their teachers. The chemistry teachers were concerned about the impact of student selected groups on the classroom environment, with particular reference to the management of differentiated activities.

Research aims

This research project had two main aims:

- To investigate how students organise themselves when they are allowed to choose their own groups in chemistry lessons.

- To investigate whether students learn chemistry more effectively in same ability groups or in mixed ability groups.

In order to achieve these aims, the following research questions were asked:

RQ1: Do students choose to work in same-ability or mixed-

ability groups when they are allowed to choose their own groups?

RQ2: Which type of group works most effectively together, same-ability or mixed ability?

RQ3: Does the type of group that students choose to work in have an impact on their test marks?

Methodology

This project focused on chemistry students in grades 10 and 12 science. At the beginning of trimester two the students in each class were allowed to choose their own groups, which they then used for their POGIL activities. Grade 10 students used their groups for two theory lessons and one practical lesson. They then took a team test together, followed by an individual test on the material which they had learnt using POGIL. Grade 12 students used their groups for two theory lessons. They then took a team test together, followed by an individual test on the material which they had learnt using POGIL. Each student was categorised as having 'high', 'medium' or 'low' ability in chemistry, using their continuous assessment results from trimester one. This data was then used to analyse the composition of the groups that the students had chosen to work in.

The chemistry teachers made qualitative observations in their lessons on the way in which the different groups worked together. They also collected quantitative data on each group's performance in the form of team test and individual test marks. These marks were then compared to the students' individual test marks from trimester one.

At the end of the trimester the students were asked to complete a short questionnaire about the style of teaching and learning in their chemistry lessons.

Key findings

RQ1 Do students choose to work in same-ability or mixed-ability groups, when they are allowed to choose their own groups?

In grade 10, the majority of students chose to work in mixed ability groups (there were 16 same ability groups and 23 mixed ability groups), however nearly a third of students (30 per cent) said that they had chosen students with the same ability level as themselves, when asked who they had chosen to work with. As might be expected though, the majority of students (48 per cent) responded that they had chosen to work with friends or other named students. The grade 10 students were also asked how they would prefer groups to be organised. The most frequent response (32 per cent) was that students should be able to choose their groups. Twenty four per cent of students said that they would prefer to work in mixed ability groups and only 5 per cent said that they would prefer to work in same ability groups.

RQ2 Which type of group works most effectively together, same-ability or mixed ability?

It was generally felt that the students enjoyed working in groups and appreciated having the opportunity to choose their own groups. The chemistry teachers felt that the mid-level and lower level students benefited the most from learning in a group using the POGIL method. They reported that the mid-level and lower level students followed the instructions for the activities carefully, went through all the correct steps and experienced success, they were also less competitive than the high level students, so they shared tasks and developed their teamwork skills. The higher level students tended to try the problems first and then read the instructions after they had not experienced success. Once they read the instructions they progressed well.

The chemistry teachers felt that same ability groups showed the best team work. They also felt that slightly mixed groups were successful because the weaker students made an extra effort to perform at the same level as their teammates. Very mixed groups were not successful as the more able students tended to do all of the work and the weaker students were not able to participate. It was felt that a few of the weaker students in grade 12 chose to work with higher ability students in the hope that they would get more marks for their continuous assessment.

All of the students became more comfortable with the POGIL technique over the course of the semester as they were using it in the other science subjects as well as chemistry. When the grade 12 students expressed dissatisfaction with the POGIL method of teaching and learning it was always in relation to worries that the POGIL method, which contributed towards their continuous assessment marks, would cause them to lose marks, rather than not enjoying doing group work. When surveyed, nearly all grade 12 students said that they found group work useful in science and that group work helped them in problem solving. Seventy seven per cent of grade 10 students agreed with the statement "I work better in a group with students with the same ability as me" and 74 per cent agreed with the statement "I work better if the students choose their work group."

RQ3   Does the type of group that students choose to work in have an impact on their test marks?

The chemistry teachers compared the average mark that each group of students obtained in a test given during trimester one with the marks that the group obtained in a test in trimester two on material that the students had studied using the POGIL method.

In grade 10 the average marks for the two tests were nearly identical (59 per cent for trimester one and 58 per cent for trimester two). However, when the individual group's marks were compared it was noted that the many of the groups which contained lower ability students had gained much higher marks in the second test. This can be taken as evidence that these students benefited from working as a group. The average marks for most of the groups that contained higher level students showed little change, or had dropped slightly. This could be because these students had gained near perfect marks in their previous tests, so it was difficult to show improvement, or because these higher level students gained less from working as part of a group.

In grade 12 the average mark for the test which the students took after learning using POGIL was much higher (85 per cent) than the average mark for the test that the students took in trimester one (65 per cent). The groups in grade 12 were more mixed than the groups in grade 10 but of the 13 groups which showed an increase in average grade of more than 15 per cent, nine of them included lower ability students.

Although it is difficult to compare the results of tests in different topics, it is safe to conclude that the students' academic performance was not adversely affected by the introduction of the POGIL method, or by the students choosing their own groups.

Conclusion

In trimester two the chemistry students experienced two changes to their classroom routine, they were asked to choose their own groups to work in and they learnt some of their chemistry material using the POGIL technique.

The chemistry teachers have concluded that allowing their students to choose their own groups was a positive change, as their students make fewer complaints about the composition of their

groups and they were more likely to resolve their teamwork issues by themselves, rather than asking for their teacher to intervene. Since the students tended to chose to work in similar ability groups it is still possible to provide differentiated resources and teaching to these self-selected groups. The chemistry teachers have decided that they will continue to use self-selected groups in trimester three.

The introduction of the POGIL method of teaching and learning was challenging for both the chemistry teachers and their students. The chemistry teachers felt that, as the trimester progressed, their students developed their skills as independent learners and their teamwork improved. The chemistry teachers enjoyed teaching using the POGIL technique and they felt that it had improved their teaching technique. They had a better understanding of how groups of students work together and they had learnt how to design resources which develop their students' independent problem solving skills.

1.5 The effectiveness of pair-work versus larger group work

Wafa Abdulmunem, Mona Mohammed Al Hammady and Martina Dickson

ADEC's vision for science is that it will become an increasingly hands-on, student centred subject with plenty of opportunities for group practical activities and there will be a distinct shift from teacher-led, teacher-centred practices. There is a large body of research showing that having students work in very small groups (ideally, pairs) is a more effective educational strategy than large groups of four or more since it gives the individuals a greater opportunity to try activities independently and then to reflect[2].

The UAE has a very strong ethos of group culture where 'the group's contribution is more valued than the individual's' in many walks of life[3]. The social fabric of the UAE is built upon the foundations of family, which is often reflected in the tendency and bias towards large group activities.

To date, research into the effectiveness of pair-work, has been carried out predominantly in Western countries. The question which this research aims to answer is whether this finding that pair-work maximises the achievement of students also applies within the social and educational culture in the UAE.

Research aims

This research investigated whether, if the same lesson is taught by the same teacher using exactly the same activity, with the only variable being the size of the group (individual, pairs or large groups), it necessarily follows that, as might be predicted based on the western research, attainment in the group who followed the activities in small groups perform better than the student sample group who worked in large groups? Or, do cultural influences and preferences for teaching to and working as part of large groups alter this effect?

The research took place at Palestine School and each class that participated in the project contained 25 - 27 girls aged approximately 17 (Grade 12). Five classes were analysed; two taught by one teacher, three taught by another. This was to allow inter-comparisons across teachers to rule out the effect of the teacher's particular influence and acts as a repeatability check.

(2) See for example, Topping, K. (1992) 'Cooperative learning and peer tutoring: An overview'. The Psychologist, 5(4), 151157-; Wood, D. & O'Malley, C., (1996) 'Collaborative learning between peers: An overview'. Educational Psychology in Practice, 11(4), 49-; Klein A. ,Waxin M.F., Rednell E. ''The impact of the Arab National Culture on the Perception of ideal organisational in the UAE' Education, Business and Society Vol 2 Issue 1

(3) Al Mammari (2007)

Methodology

Firstly, in preparation for the study, 50 classes were observed over a four week period. The observers recorded the following information:

- Types of grouping during activities observed during the lesson: individual/ pair-work/ large group/ whole class

- The dominant usage of these, in terms of time allocated during the lesson

Then, a student questionnaire was completed by 125 students in grade 12. They were asked to circle the appropriate response for them:

1. I prefer to work: Alone/In pairs/In large groups of four to six

2. I know that I understand concepts better when I have the chance to try an activity: Alone/ In pairs /In large groups of four to six people

The questionnaire was designed to gather evidence on whether the students actually preferred to work in larger groups because of their cultural familiarity and comfort with this trait, regardless of what they felt logically was actually the best for their learning.

A lesson was then carefully developed whereby the two main activities were carried out after teacher explanation. The first activity (solving a series of problems which involved applying a new relationship and solving for one unknown) connected to the first learning outcome of the lesson and was carried out by individuals in one class, by pairs in another, and as large groups of five or six in the third class. The second activity connected to the second learning outcome and involved graph analysis connected to a Physics concept. A short quiz was then devised which would directly assess the students' attainment of learning outcomes. In this way, sufficient data was gathered in order to compare the effect of grouping on students attainment in teacher A's lessons. The process was repeated for a second teacher (teacher B) for pairs and large groups to check for repeatability as mentioned earlier.

Key findings

Prior to the intervention large group work was the dominant method of teaching (observed in 45 per cent of lessons over a four week period), and it was also the favoured method of working by students (chosen by 47 per cent of students surveyed). In addition to the cultural favouring of the large groups, it could be argued that less motivated or diligent students also prefer this method since it is less demanding of them – they can easily 'hide' behind more dominant students. However, the research showed that students' attainment of learning outcomes decreased when they carry out the activities in large groups where there is little or no opportunity for all students to participate fully, regardless of teacher/student preference and comfort with this strategy.

Following the intervention, the research showed that students who had carried out their activities in pairs were more successful than those who had carried out their activities in large groups. In particular, students who worked in large groups were at a disadvantage when answering medium level skill questions.

Students who had carried out their activities in large groups was comparable to the outcomes of those groups who had carried out the activity alone.

Conclusion

The research showed that large group work (five or six students) is a favoured teaching strategy and a preferred method of working among students. There may be important, historically significant, powerful reasons for this desire to be part of a large social group. However, the results of our study strongly suggest that the most successful grouping, which is not necessarily the most culturally natural one, is that of the pair-grouping, a finding which is in-line with current international research. This is particularly evident with more challenging work. So, there is a mismatch between current educational practices in the classroom, and the practices which would actually enable students to achieve their full potential. Part of the focus of the educational reform in the UAE must therefore be to change these practices, replacing large group work with pair work where appropriate and possible.

1.6 An evaluation of the use of ICT-based simulation and modelling software in science lessons

Ali Abdullah Al Tamimi, Ahmed Mostafa, Fahd Ahmed, Abdelhamid Al Omari, Ismail Al Hosani and Andrew Walden

The action research project described here was undertaken at Khalifa bin Zayed Boys' Secondary School (KBZ School) in Abu Dhabi during January and February 2012.

In the past, like many schools in Abu Dhabi, science lessons at KBZ were delivered using traditional, mainly teacher-centred, methodologies. Practical teaching activities, in particular laboratory work, were used on occasion, but the majority of science lessons consisted of intensive verbal instruction by the teacher accompanied by frequent progress-checking through teacher-mediated question and answer sessions. There was strict adherence to the textbook content and sequence, and teachers talked for most of the time during lessons.

Over the last four years, however, a CfBT Partnership Teacher has worked alongside the science teaching team at the school to address the requirement of ADEC to modernise teaching and learning in the science subjects. Key themes of the ADEC agenda for science education are to make learning more student-centred, individualised and differentiated, to promote deep learning and skills development through the use of scientific enquiry methods, and to develop students' critical thinking skills. ADEC is also encouraging the use of ICT in learning. The science teachers at the school have engaged positively with this process of change and have shown a willingness to update their classroom practices in response to the ADEC agenda. It was the broad objective of this research project to further contribute to this modernization process.

Research aims

The focus of the research project was to investigate the degree to which the use of proprietary simulation and modelling software in science lessons at KBZ School could have a positive impact on learning and teaching. This type of software can facilitate a very student-centred learning environment, is highly interactive, and can be used to develop skills of independent and collaborative learning and critical thinking[4]. It has been shown to promote the development of graphic interpretation, hypothesis construction and prediction skills in science students. There is a growing body of evidence to support the notion that simulation technology can enhance classroom instruction[5]. Students are increasingly familiar with computer technologies in their lives outside of school, and there is evidence to suggest that they are enthusiastic about using ICT to learn in schools[6]. This research investigated whether these benefits could be seen in the very different educational and cultural context of an Abu Dhabi secondary school. In order to research this, the following questions were asked:

RQ1.   Can simulation and modelling software be used to improve the quality of teaching in science lessons at KBZ School?

(4) Quillen, I. (2011) 'Technology Evolves to Offer a Clearer View of Science', Education Week, v30, Iss35, pp 5253-.
(5) Rutter, N., Van Jooligen, W.R. and Van der Veen., J.T. (2012) 'The Learning Effects of Computer Simulations in Science Education'. Computers and Education, v58, n1, pp136153-.
(6) Campbell, T., Duffy, A.M., Hsu, H., Wang, S. and Wolf, P.G. (2010) 'Learning with Web Tools, Simulations and Other Technologies in Science Classrooms'. Journal of Science Education and Technology, v19, n5, pp 505- 511.

RQ2.   When simulation and modelling software is used in science lessons at KBZ School, does it improve the level of learner engagement and motivation?

RQ3.   What is the effect on learner achievement of using simulation and modelling software in science lessons at KBZ School?

Methodology

A mixed methods research approach was used to collect primary qualitative data. Data was collected using questionnaires which focussed on teacher and student perceptions immediately after using the software in a trial lesson. Respondents were asked to what degree they agreed or disagreed with a number of statements relating to enjoyment, preference, motivation, concentration, achievement and quality of teaching. The data presented here reflects the responses from 156 student and eight teacher questionnaires collected over a series of lessons covering a variety of topics in biology, chemistry and physics. Additional data was collected through a small number of informal teacher and student mini-interviews carried out at the end of each of the simulation and modelling trial lessons. A formal observation of teaching and learning was carried out during each trial lesson.

Key findings

A summary of the data collected from the student questionnaires indicates that most were very positive about using the simulation and modelling software:

- 90 per cent of learners reported that they enjoyed learning science using computer-based resources, with only four per cent stating that they did not enjoy learning this way

- 84 per cent of respondents stated that they preferred learning science this way, while four per cent expressed no preference and 12 per cent did not prefer using the software to learn science

- 87 per cent of learners felt that they would feel more motivated if they used computers to learn, with only eight per cent disagreeing with this statement

- 82 per cent of the students surveyed reported better concentration than in their usual science lessons, and a further ten per cent felt their concentration levels were unchanged

- 85 per cent of learners felt they would learn more in science lessons if they used computers for their work, with only six per cent in disagreement with this statement

- 89 per cent of respondents felt the teaching in the simulation and modelling trial lesson was as good as or better than in their usual science lessons.

The teacher questionnaires produced a 100 per cent positive response against each research statement from the five teachers who delivered the trial lessons.

Lesson observation reports indicated an unusually high level of student engagement and focus in the trial lessons, accompanied by very positive student behaviour. This second point was commented on specifically by three of the teachers. In particular, a class of grade 10 students noted for usually exhibiting challenging, negative behaviours had been focussed on their work during the trial lessons. It was evident students were working collaboratively in many cases and that most viewed the completion of worksheet activities as a positive challenge. In each trial lesson, the teacher was asked for assistance by students when necessary, although it was observed that most learners were able to make very good progress against learning outcomes on their own or by checking their understanding with other students. Two of the teachers commented on

the rapid progress made by learners when using the software. For example, one of the teachers reported that the time taken to understand atomic structure and bonding was approximately halved compared to his usual approach. A further three teachers commented positively about the capacity of the software to promote differentiated practice through the provision of stratified worksheets. One teacher was very pleased to observe that although his students talked during the lesson much more than in his usual classes, most of their conversations were focussed on the work in hand.

The teachers experienced varying degrees of challenge in adapting to the new methodology. One teacher was immediately comfortable in his new role as organizer/facilitator, reduced his verbal input accordingly, and was confident in allowing students to take control of their own learning. Observation of the remaining teachers showed that adapting fully to this new role would take time and practice. A lack of teacher familiarity with the software was reflected in some of the trial lessons being less well structured than their usual science lessons. All of the teachers involved in the research were willing participants in the trial lessons and despite a healthy level of professional scepticism prior to using the software, in the end of lesson mini-interviews they each commented very positively about its value and the effectiveness of this approach to teaching and learning. Each teacher reported that they enjoyed using the software.

The students themselves were in nearly all cases very enthusiastic about using the simulation and modelling software. Several expressed the view as they left the room at the end of the lesson that they had really enjoyed using the software and wanted to use it again. Short interviews with three randomly selected students in each lesson supported the positive research findings from the questionnaires with favourable comments made about their motivation, concentration and achievement in the trial lesson. Students particularly liked the idea that they could monitor their own progress in a topic by using the quiz function designed into the software.

It is important to note that the use of the simulation and modelling software in the trial lessons inevitably had some 'novelty value' with the students. Certainly none appeared to have been exposed to this type of learning previously. In such a scenario, it is probable that student questionnaire responses collected after a period of familiarity with the software might yield a less positive picture of student perceptions. Nonetheless, on first exposure the majority of the students involved in the trial lessons appeared to relish the idea of a learning environment in which they had more direct control over their learning, in which they were encouraged to learn from each other, which was task-orientated and which delivered a sense of personal achievement in frequent doses.

Finally, despite the generally very positive picture painted by the research, the data collected from the questionnaires and lesson observations indicate that around one in ten of the students did not adapt well to using the software and responded negatively about indicators such as their motivation, concentration and achievement. A common factor for these learners was a lack of acceptance on their part of responsibility for their own learning, compounded by concerns that they would be unable to achieve without the usual level of directional input from the teacher. If the use of simulation and modelling software is extended at KBZ School, these more dependent and less confident learners should be identified and given extra support to enable them to successfully navigate the transition to this new way of learning.

Conclusion

The data collected strongly support the notion that the use of simulation and modelling software in science lessons can improve the quality of teaching at KBZ School, and that learner motivation and engagement are improved with this approach. Student and teacher testimony also suggests that learner achievement is enhanced considerably, although a further more detailed study over a longer period would be needed to confirm this.

It appears that most teachers require time to adjust to this new methodology and that they would benefit from continuing professional support during the transition period. The same can be said for a small minority of students.

To adopt the use of this software on a larger scale at KBZ School would require a continued commitment by the school leadership to invest in the necessary facilities and resources. For example, at present the school ICT room is available for only a limited number of periods per week for science lessons. A potential solution would be the provision of a class set of laptop computers and a dedicated room for ICT-based science lessons.

Having made a start with this action research project, KBZ School is now in a suitable position to develop a model through which the integration of this software into science education can take place across other ADEC schools in Abu Dhabi.

2. Process Oriented Guided Inquiry Learning (POGIL) and Arabic Continuous Assessment Rich Tasks (ACART)

2.1 How can we make physics lessons more engaging in order to improve student motivation?

Zakia Mohammed Humaid, Taeibah Rashed Al Ketbi, Mariam Ahmed Al Jabri and Kate O'Sullivan

The Continuous Assessment framework for Cycle 3 Science (Grade 10-12) changed greatly this year. Even now it is different depending upon the grade, stream and subject. Classes in grade 11 are streamed into two bands, an academic stream called 'science' and a more vocational stream called 'arts'. This has led to two different physics curriculum being taught in the two streams, which can lead to different methods of teacher delivery and different levels of student engagement and participation. As part of the new continuous assessment strategy, guided inquiry (Process Orientated Guided Inquiry Learning POGIL is an example of this) must be assessed throughout the trimester, in order to assess the following skills:

- Explaining
- Gathering knowledge
- Team work.

It is important to Al Qadisiya School to improve student progress. Physics is often seen as difficult and complicated by the students, therefore if student engagement can be improved this will lead to enhanced performance and therefore increased progress.

There are many factors which impact on teachers' ability to deliver engaging lessons including time constraints of a heavily content based curriculum and the difference in teacher and student perception of an 'engaging' activity. Therefore, in an attempt to address the issues surrounding this, this research sought to investigate how physics lessons can be made more engaging in order to improve student motivation.

Research aims

The research aims were categorised into three main areas:

- To investigate student motivation in physics
- To improve engagement of students within grade 11 physics classes

- To introduce POGIL (Process Orientated Guided Inquiry) techniques to the physics teachers

In order to achieve these research aim, the following research questions were addressed:

RQ1.   Does using POGIL improve student engagement in both grade 11 streams?

RQ2.   Do students think that POGIL is a valid technique in comparison to traditional teaching methods?

RQ3.   Can POGIL become embedded practice within the physics department at Al Qadisiya School?

Methodology

The research was carried out at Al Qadisiya School; there were 57 participants from Grade 11, class Science 1 and Art 1. In order to address the aims of the project, a mixed methods approach was used, including primary data collected using a variety of qualitative methods, mainly questionnaires, focus groups and observations. Specifically, the following methods were used:

- Focus group: five students were interviewed at the start and end of the project
- Student questionnaire of the Grade 11 classes at the start and end of the project
- Lesson Observations of both the Grade 11 'Science' and 'Arts' stream classes to compare student activity.

In order to attempt the successful implementation of POGIL the physics teachers were trained on this methodology (along with the other science teachers) over the course of the first trimester. The lessons were planned collaboratively as a department and, teaching commitments aside, the other physics teachers observed one another's classes. The observation focused on what the student learnt, rather than what is delivered by the teacher.

Key findings

The research found that both arts and science streams of students preferred to complete lessons by POGIL, rather than any other technique. Interestingly, the science stream students reported that they preferred didactic methods of teaching, rather than active learning. Conversely, the arts stream students reported that they preferred active learning strategies over didactic methods.

This difference was addressed during the focus groups. When questioned, the science stream students said that were concerned that if the teacher was not standing at the front of the class and teaching in a didactic style, then they would miss details that might be examined on the final exam.

Conclusion

The results of students' questionnaires and the focus groups demonstrated that by the end of the project both streams in grade 11 preferred the POGIL active learning approach. Only nine students out of 57 thought that answering questions from the text book was the most enjoyable way to be taught, with an overwhelming 33 thinking that POGIL was the most enjoyable method by which to learn.

POGIL was successfully implemented into lessons by the physics teachers; therefore it has potential to become embedded practice, so long as the modules are planned thoroughly and the coordinator leads this to ensure its uptake. Moreover, the results have shown that POGIL

methodology is in the lead compared to other active learning approaches. Therefore, physics students' engagement has improved, thus this is a valid method to promote student centred learning whilst simultaneously improving motivation.

Future work from this research should be larger in scale and should by a comparative study focusing on student examination results of those taught using POGIL and those taught using traditional teaching methods. This will aim to show students, teachers and parents the effect of the different methods in 'real' terms.

2.2 Investigating grade 12 science stream students' attitudes towards learning biology using the POGIL strategy

Balqees Mohammed supported by Fiona Victory

This research project is about bridging the gap in students' perceptions between skills and knowledge so that students will believe that gaining skills will help them to gain knowledge.

At Palestine School, students aspire to study competitive, intellectually demanding subjects such as medicine at university, and this is why the grade 12 science stream students are very concerned with their marks in their continuous assessment tasks – each fraction of a percentage point is important to them.

These grade 12 science stream students are learning in a learning environment which is being changed and modernised. ADEC is implementing changes aimed at giving every student a rounded education which will prepare them for the modern workforce. An example of this change is that continuous assessment tasks must assess all of ADEC's twenty-first century skills. Students are distrustful of these changes and they do not understand how learning skills will support their learning and increase their achievement in school and prepare them for independent study at university.

Process Oriented Guided Enquiry Learning (POGIL) is a new teaching, learning and assessment strategy for science which was introduced by ADEC into Abu Dhabi's Cycle 3 schools at the beginning of the 2011-2012 academic year. This research was designed to monitor the grade 12 science stream students' attitudes towards learning biology using the POGIL strategy and to gather evidence as to whether using the POGIL strategy can provide grade 12 science students with the skills that they need to gain sufficient knowledge and understanding in order to help them to raise their marks and achievement in their Ministry of Education external exams.

When the POGIL strategy was introduced in trimester one 2011 the grade 12 science stream students were resistant to the change, which is one of the reasons why this research project was developed.

Research aims

The main aims of this research were to:

- investigate grade 12 science stream students' attitude towards learning biology using the POGIL strategy
- investigate whether using the POGIL strategy will help grade 12 science stream students to raise their academic achievement in biology
- investigate whether the skills that students develop by using the POGIL strategy will make it easier for them to learn the grade 12 science stream biology curriculum.

In order to answer these aims, the following research questions were asked:

RQ1. What is the initial attitude of grade 12 science stream students towards learning biology using the POGIL strategy?

RQ2. Does their attitude change as they become more familiar with the POGIL strategy?

RQ3. What is the impact on students' marks when grade 12 science stream students are taught biology using the POGIL strategy?

RQ4. Does the POGIL strategy help students to remember and understand the grade 12 biology curriculum?

Methodology

All of the grade 12 science stream students were given one POGIL lesson at the end of trimester one and three POGIL lessons during the course of trimester two. These POGIL lessons contributed towards the students' continuous assessment marks. At the end of each POGIL lesson the students were asked to complete a short questionnaire about the lesson.

At the end of trimester two the students were given a written test which examined both materials which had been taught using the POGIL strategy and material which had been taught using more traditional teaching techniques. The students' achievement in this test was analysed.

The researcher also made qualitative observations of the students' behaviour during the POGIL lessons and related practical activities.

All of the students in the grade 12 science stream followed the same programme of activities. The results for grade 12/S2 were analysed for this research project. 12/S2 contained 29 students in trimester one and 26 students in trimester two.

Key findings

RQ1. **What is the initial attitude of grade 12 science stream students towards learning biology using the POGIL strategy?**

The grade 12 science stream students were given their first POGIL lesson at the end of trimester one. This activity contributed towards their continuous assessment marks. It was observed that the students were not able to focus on their work, probably because they had been given too many tasks to do for the time period. At the beginning of the lesson the students had to be persuaded to try the new POGIL strategy. When they started working they said that they enjoyed the activities.

When surveyed, the responses showed that most students preferred learning using the traditional, teacher centred method, to learning using the POGIL strategy. Most students disagreed with the statement, 'POGIL will help me to increase my achievement'. The class was divided over whether they enjoyed learning using the POGIL strategy. Seven students agreed strongly and seven students disagreed with the statement, 'I was happy and interested in doing the POGIL activity'. About half the class said that they had a clear understanding of the POGIL strategy. However, most students agreed with the statement, 'POGIL is increasing cooperation between students'. Students were unsure whether the POGIL technique would develop their independent study skills.

RQ2. **Does their attitude change as they become more familiar with the POGIL strategy?**

After the fourth POGIL lesson, the students' responses were significantly different. Nearly all students agreed with the statement that they were happy and interested in doing the POGIL activity and every student agreed that 'POGIL is increasing cooperation between students'. The majority of students agreed with the statement, 'POGIL is giving all the students the opportunity to contribute to the learning process' and none of the students disagreed with the statement, 'POGIL increased my self confidence'. Students agreed that the POGIL strategy was increasing

their ability to think and to research.

The grade 12 science stream students' positive experiences of using the POGIL strategy in their biology lessons was reflected in their changed response to the statement, 'learning through POGIL is better than the traditional learning method'. In trimester one the majority of the class disagreed with this statement, by the end of trimester two less than a quarter of the students disagreed with the statement.

RQ3. What is the impact on students' marks when grade 12 science stream students are taught biology using the POGIL strategy?

Despite the fact that the students enjoyed learning using the POGIL technique and realised that they were gaining valuable study skills from it, the students were still concerned about having their POGIL lessons contribute towards their continuous assessment marks. The class was still divided over whether learning using the POGIL strategy would increase their achievement and more than half the class still agreed with the statement, 'I like the POGIL strategy but I do not like that it is part of my continuous assessment'. Grade 12 science stream students are very concerned about their continuous assessment marks as they are aware that they contribute towards their final end of year grade and that that grade will determine their future.

However, when the students' results from their continuous assessment test were compared for the POGIL and non-POGIL questions, the average mark for the POGIL taught questions was slightly higher than that for the non-POGIL taught questions (92 per cent and 89 per cent respectively). This information will be shared with the students at the beginning of trimester three.

RQ4. Does the POGIL strategy help students to remember and understand the grade 12 biology curriculum?

The students were given a practical lesson (eye dissection) after they had studied the structure of the eye using the POGIL technique. The students' performance in the dissection and their ability to identify each part of the eye was excellent when compared to the performance of students in previous years.

When questioned informally, the students said that they can remember more material when they learn using the POGIL technique than when they learnt using traditional methods.

At the time that this report was written the students results from their Ministry of Education external examinations had not been released, so it was not possible to evaluate if learning using the POGIL method has improved the students performance in their external examinations.

Conclusion

This research has shown that although grade 12 science stream students initially had a negative attitude towards learning biology using the POGIL strategy, their attitude changed as they became more familiar with the POGIL strategy. There was a positive impact on students' marks when they were taught biology using the POGIL strategy and there is an indication that the POGIL strategy can help students to remember and understand the grade 12 biology curriculum.
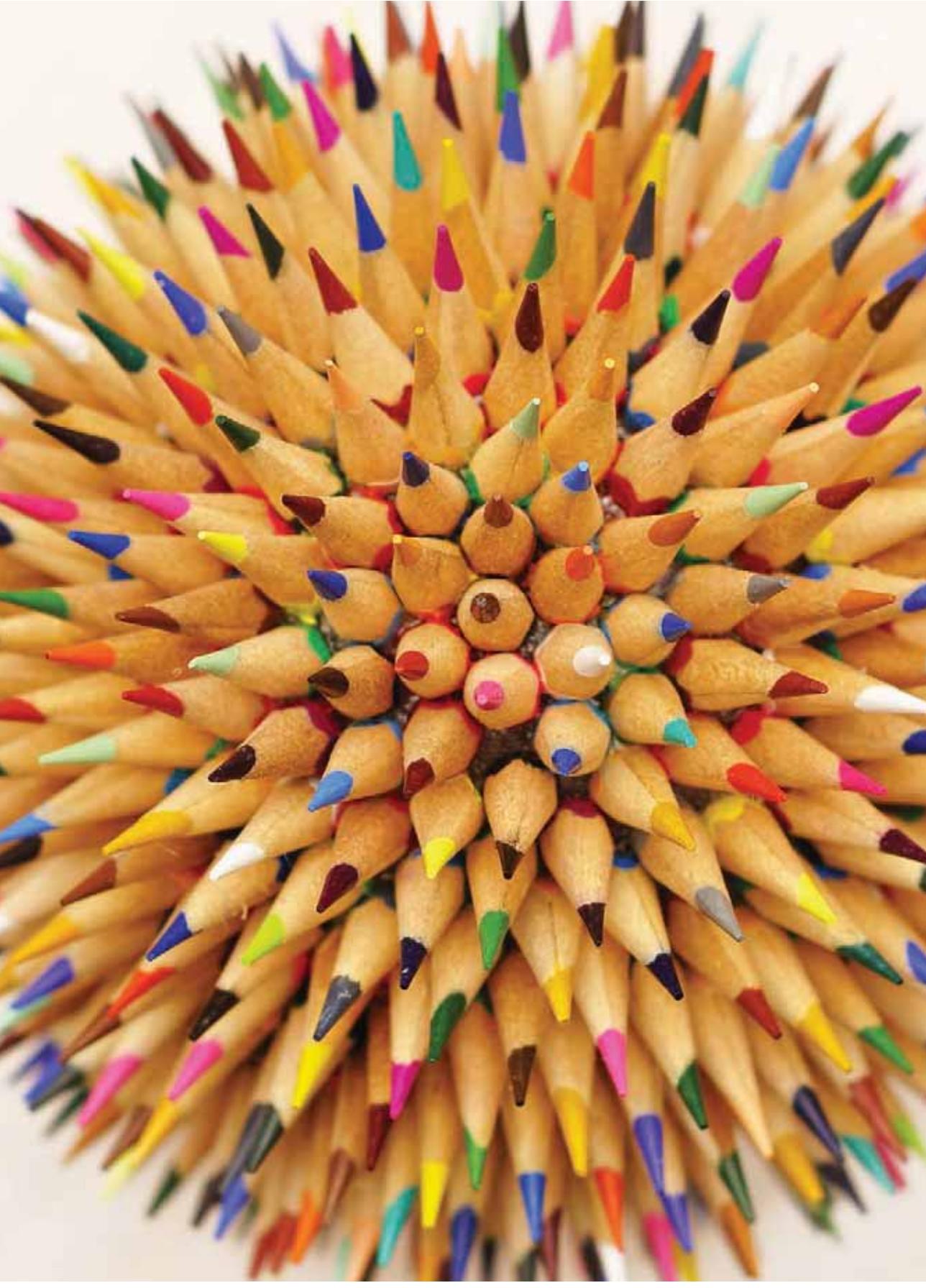
2.3　The Impact of ACART on teaching and learning
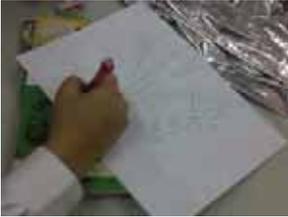
Fatima Al Ebri, Nadia Wishah, Mahmoud Wishah supported by Enas Trad

Low Arabic literacy levels among students in UAE government schools and teaching skills of Arabic teachers are particular areas that have recently caused concern for the Abu Dhabi Education Council (ADEC). Current interventions in government schools in the Abu Dhabi emirate have mainly focussed on English, Science, Maths and ICT. However, this research will examine interventions and appropriate effective approaches to raise Arabic teachers' awareness of teaching and learning issues and enhance their language teaching methodology skills. The research reinforces the principle and importance of moving away from text book learning and focusing on a more practical application of Arabic in the classroom. It was influenced by the principles and practices of the New School Model that was introduced in 2011 and the 7 Key Skills introduced this year by ADEC. Arabic Continuous Assessment Rich Tasks (ACART) was also influenced by the English Continuous Assessment Rich Tasks (ECART) programme which was developed by ADEC for all 6-9 and 10-12 schools in 2011.

This research area is of paramount importance to the school and to ADEC because the development of Arabic has been an area that has not been pursued by ADEC or other providers as part of the educational reform programme to date.

As part of the CfBT intervention to improve Arabic teaching in two CfBT cycle 2 schools in Abu Dhabi (Al Jalil Al Faheem 6-9 Boys School and Al Thoraya 6-9 Girls School), the researchers decided to examine ECART, the New School Model and the 7 Key skills to develop a new Arabic programme. This merged into ACART – Arabic Continuous Assessment Rich Tasks.

Research aims

The research had four main aims:

- To evaluate the impact ACART had on teaching and learning of Arabic

- To assess the impact of ACART on students absences

- To evaluate the Arabic teachers experiences of introducing ACART

- To evaluate the impact of ACART on the students learning of Arabic.

In order to achieve these research aims, the following research questions were addressed:

- What are the student's views on ACART?
- How does ACART impact on absence?
- What are the Arabic teacher's views and experiences of ACART?

Methodology

The starting point for the project was to ascertain a baseline from which to work from. This involved an initial assessment of the Arabic teacher's confidence in teaching Arabic, detailed observations of a variety of Arabic lessons, an assessment of the teacher's relationship with the students and an evaluation of the student's concept of Arabic as a subject.

In order to evaluate the success of the ACART and evaluate the research aims a combination of both quantitative and qualitative measures were chosen to ensure triangulation. As such, information was yielded in the following ways:

- Interviews with students and teachers
- Questionnaires with students and teachers.

In order to address the aims of the research, a mixed methods approach was used, including primary data from interviews with the teachers and students from grade 9/3 and 9/4 in the form of a questionnaire, formal and informal classroom observations and classroom support alongside student and teacher questionnaires all of which yielded qualitative data. Interviews with the teacher and students were also used to provide insight into their thinking and experiences.

Key findings

Results revealed that teachers have excellent subject knowledge of the Ministry of Education (MOE) Curriculum and the MOE textbook and how to teach them, but they are not always aware of how students learn or how to plan lessons. There is a positive climate for learning in most classes where the relationship between teachers and students is good. In some classes there is a variation in learning activities, most of the activities are created by the students. Teaching regularly results in passive student participation as there is an over-reliance on the text book and therefore teaching strategies fail to address the needs of most students.

ACART was designed to ensure that there were greater levels of student engagement in lessons with a focus on improving Arabic Language and Literacy. The Continuous Assessment Rich Task involved students working together to produce a variety of projects on a set theme. Documentation included mind maps, resource lists, references, planning sheets identifying which student was responsible for what aspect of the project and a Rich Task outline. Final projects in the first term included an album, a newspaper, an autobiography about Sheikh Zayed and the UAE culture, a leaflet and a Magazine. In term two Rich Tasks included a film, hard backed text books, calendars, mugs and newspapers.

Interviews with a grade 9 teacher revealed that experiences of teaching Arabic before ACART placed heavy reliance on text books. When ACART was introduced, the teacher reported initial doubts about what the students were learning and also expressed apprehension about the daily lesson plan and the new workload. Following the introduction of ACART the teacher noticed a change in student attendance and suggested that ACART had positive effects on attendance for some children.

From the student's perspective, it appeared that they were reluctant to initially engage, as it was a new and unknown initiative. However once they had the opportunity to gain better understanding of ACART and why it had been introduced, then they were able to use their creativity to design and execute some excellent projects.

Based on the results from Term One, it is evident that ACART has the potential to help to produce and develop a new generation of creative students. With its emphasis on reading and writing teachers saw an improvement in students writing and research skills. Students in grades 9/3 and 9/4 now have the ability to judge and evaluate what they have read, to research, use resources and skills for documenting and organising information and tackle any problems by pinpointing the facts and solutions. They are more capable of looking at positive and negative aspects of issues and are beginning to become more independent learners and set their own targets whilst working successfully as a team. Time has become an important factor in their education and conversely at the beginning of the year Arabic was not seen as a priority and as such sufficient time was not devoted to it. Now, it is apparent that ACART has developed Arabic into an important subject that students want to succeed in and strive to do well in and it is no longer seen as a 'boring' subject that can only be learnt through rote learning.

Conclusion

The Arabic Continuous Assessment Rich Tasks (ACART) was designed to develop students Arabic reading and writing with three main goals:

- To encourage collaborative work and ample opportunities for interaction, communication and co-operation;

- To encourage learners to set their own goals and for students

- To take more responsibility for their own learning activities and processes.

This has been achieved in Grade 9/3 and 9/4. Some lessons have been effectively planned by the Grade 9 teacher, the purpose of the planned lessons were clear and learning was reviewed as an integral part of the lesson. Lesson objectives were stated clearly and teachers made full and effective use of many resources including information and communication technology to promote active learning.

A range of real life skills were also employed by the students, including letter writing, interviewing, researching, writing for a range of audiences, presentation and team work. The teacher assumed the role of facilitator and mentor in most cases.

To achieve this level success in such a limited time period is an indication of the potential long term success that can be achieved by ACART. Intervention also included one-one support for the teacher, where ACART material was planned prior to the commencement of the projects and were explained to the students through class discussion sessions. It also involved working alongside classes and with groups of students to ensure research was used effectively and written work was not merely 'cut and pasted' material. The students were also required to present their Rich Tasks to their peers and this involved a prior discussion on presentation skills and the role of the presenter with individual groups.

Overall there was an excellent response to ACART from some of the teachers and all of the students who took part in the Rich Tasks. The behaviour of the learners in Grade 9 highlighted the extent to which learners enjoyed their Arabic lessons. The students displayed a real sense of pride in their learning, and were keen to contribute and rise to the challenges set. Students were starting to think imaginatively and offer lots of ideas of their own when considering how to

improve their writing skills.

The ACART project highlighted the following areas of development:

- The need to equip Arabic teachers with appropriate training to help them to help students write in different genres and how to plan lessons effectively on a daily basis not just during project work.

- To improve the quality of teaching and learning so that a higher proportion of lessons are rated as good or better and the rate of pupils' progress is accelerated.

In response to the findings, the researchers have addressed the key findings in two ways. Firstly through CPD which concentrates on improving teachers understanding of pedagogy that supports Arabic and student literacy. Secondly with the development of new Arabic pedagogy in conjunction with ADEC called ACART (Arabic Continuous Assessment Rich Tasks). Progress has also been reflected in regular Cycle 2 Coordinator meetings. Here teachers and Coordinators have been supported with teaching using a thematic approach and using the textbook as an additional resource. Likewise, Arabic teachers are using planning folders to enhance and log lesson planning. Subject related displays have now been introduced into classrooms and have proved successful. Behaviour of students is improving and a positive atmosphere is being created to encourage students' to take risks in their learning. A recent lesson observed was considered as the "best seen" by the Vice Principal as she observed students taking part in a Rich Task, where they were on task and more engaged in their own learning.

2.4 Changing grade 12 student and parent attitudes on guided inquiry learning through information sessions

Anda Lucia supported by Banan Al Qawasmi

This action research project focused on the change process of shifting attitudes relating to Process Orientated Guided Inquiry Learning (POGIL), group-based guided inquiry, in grade 12 Science stream students (G12S), and their parents at Um Ammar Secondary School for Girls. There are 166 grade 12 students at Um Ammar, 71 of which are in the science stream (12S). All grade 12S students take four different science subjects (chemistry, biology, physics, and geology) each term, in addition to their regular classes. They are expected to get the highest mark so that they can secure a place at an institution of higher education. Many of the grade 12 science curricula have been and are still content heavy and at the end of each term there is an exam which tests mainly the recall of details found in the text book rather than on the application of knowledge and skills. The consequence of this is that grade 12 science teachers feel that it is necessary to cover every word of the book, through a lecture style, in order to cover all of the details that may be asked on the end of year exam. Traditionally, grade 12S classes are taught either through rote-lecture style, or in large group work style with students mainly listening and underlining information in the text and memorising every detail from the book; however in recent years teachers have been integrating more student-centred classes with varied success.

This year ADEC asked teachers to make some significant shifts within the classroom across all grades. These essential new shifts directly impact the delivery of working towards POGIL: focusing on group work; shifting to a more student centred style of class mainly through guided inquiry learning; and developing applicable skills rather than rote memorisation testing. Teachers have been encouraged to move away from the details in the book yet cover the learning objectives found in the book via engaging student centred tasks such as group-based guided inquiries.

Furthermore, students in G12S had rarely been assessed on group work for marks. In addition to ADEC shifts in the classroom they also introduced a Continuous Assessment (CA) framework that required group work, skill development and accountability through the curriculum; G12S is a part of this framework.

Students and parents had not been exposed to enquiry-style pedagogy previously. The term 'inquiry' in the Arabic language does not have a clear and well understood translation. The word 'istiqsa' is a literal translation; however it would not lead an unprepared teacher to the same outcome as the word 'inquiry' would in English. Sometimes 'inquiry' is translated as 'baheth', meaning 'research', or 'taharri' meaning 'investigation', but these

terms are not usually associated with science.

Grade 12 science was selected as the focus of this research as it is perceived to be hard to implement changes with this group as students and parents are very anxious about changes and how changes might affect marks.

Research aims

The research had three main aims:

1. To better understand the factors that contribute to the perceived negative attitudes of students and parents towards group-based guided inquiry learning.

2. To increase understanding of what group-based guided inquiry is in G12S parents and students through access to additional information, and by having first-hand experience(s) in this learning style.

3. To try to shift the attitudes, positively, through simple interventions with both the student and the parent groups.

The following hypothesis was formed based on these research aims:

> If attitudes become more positive then teachers will be able to proceed with this teaching/learning style, and in doing so will develop the critical skills of these graduating students, ensuring they are better prepared for life and/or higher education. Likewise, if students are excited about science, through group-based guided inquiry, then students will develop a better understanding of content. As opposed to rote learning, group-based guided inquiry is more likely to inspire and prepare students to pursue a science career.

In order to investigate this hypothesis, the following research questions were posed:

RQ1. Can additional information help students and parents to better understand the benefits of this learning style?

RQ2. Can better understanding of this learning style lead to a positive attitude shift?

RQ3. Can simple interventions make a difference? (Such as giving additional information, and/or having first-hand experience(s) in this learning style).

Methodology

Students

Students' views were sought via a questionnaire in order to measure attitudes prior to the intervention, and to establish which factors might be contributing to negative attitudes. Fifty six students responded. The results from this were used to focus the interventions.

The first set of interventions was for G12S students only and took place over a two month period. The first round of interventions focused on building student understanding through first hand experiences of:

- roles and expectations during group work;
- the purpose of enquiry and how to progress though this type of a task;
- the skills assessed and initial understanding of these skills;
- the inquiry skill rubric and how the student can use it.

At the end of the first intervention period a second student survey was conducted. Students' voices were also considered an important part of the research. Students who volunteered participated in a video interview. Students were asked questions in both Arabic and English and were given the chance to explain/expand on their answers. These interviews revealed more about what the students understood, did not understand, and which issues affected their attitudes most.

Parents

As with the students, parents' views were sought via a questionnaire in order to measure attitudes prior to the intervention, and to establish which factors might be contributing to negative attitudes. Thirty eight parents responded to the survey.

A 30 minute presentation was made to parents. The presentation explained group work, roles and the skills that are being developed through the curriculum, as well as the benefits of this learning style. A video clip was shown of students completing a group-based guided inquiry task and parents were able to see each girl, in any given group, actively engaged in learning at any given time. Following the presentation, parents had a chance to comment and ask questions. Parents were quite anxious and challenging about how students were grouped, and the fairness of the marking system for each individual in the group.

The issues raised following the presentation, were used to develop the intervention to support parents understanding. A bilingual Frequently Asked Questions (FAQ) bulletin was created which addressed: reasons for shifting to group work with small purposeful groups; how groups were selected; how teachers could use the groups as a way to better support student learning; and noted for parents that the inquiry part of the curriculum accounts only for 20 per cent of the total mark in G12S. Attached to the FAQ bulletin was a follow-up survey.

Key findings

The baseline survey for both parents' and students' reflected negative attitudes in both populations. It was apparent that neither group felt that this teaching/learning style would help students to understand content better. Both groups felt that students would earn lower marks. They did not feel that this style would allow them to develop skills. Interestingly it revealed that although their attitudes were not positive regarding the new learning style, students and parents felt that the teacher 'had' prepared students well for this new learning paradigm.

The second survey, conducted after the intervention had been in place for two months, revealed a shift from negative towards positive. The interventions had a positive impact on the attitudes of both populations although parent attitudes did not change as much as students'.

The presentation to parents also had a positive impact. A survey conducted after the presentation revealed that:

Parents found the information session and FAQ bulletin to be informative and useful;

The session helped parents to better understand what group-based guided inquiry is;

The session helped parents to feel more confident about this learning style;

Parents still had concerns about the selection of groups and how groups would/could affect the marks.

The final survey of both parents and students revealed a shift from negative towards positive attitudes with the greatest shift on students.

Conclusion

- This research showed that:
- Parent attitudes and student attitudes are similar;
- Parents are a crucial group to gain the support of and they can negatively impact teacher progress;
- Simple interventions, such as giving first-hand and additional information, can have a positive impact on attitudes;
- First-hand experience; trying out or seeing group-based guided inquiry can positively half the strongest impact on attitudes.

3. Literacy

3.1 An investigation into teachers' recognition of and responses to literacy difficulties in three government schools in Abu Dhabi

Alexandra Limon and Asia Omar Naser
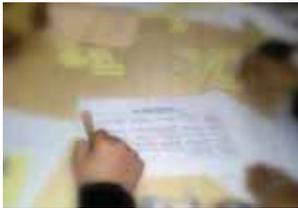
Introduction

The New School Model currently being adopted in Abu Dhabi schools requires students to move into the next grade with their peers regardless of exam failure[7]. In addition, a number of students who are classed as Special Educational Needs are being transitioned into mainstream schools from special schools at all grade levels; more than 4,600 students with special educational needs have been integrated into mainstream schools by ADEC[8]. The New School Model Policy states that 'the responsibility of meeting the specific learning needs of these students lies with the school and with the classroom teachers'[9]. The result is that class profiles will begin to follow a 'normal' distribution curve, including students of lower as well as higher abilities.

The New School Model, which will continue to be implemented over the next few years and follows an inclusive methodology, has a student rather than a subject specific focus[10]. Teachers of secondary grades who previously may have had classes of similar ability levels will now be required to differentiate significantly for the 'included' students. The recent addition of native English speaking teachers, to teach English, as Government school staff, may have increased the diversity of understanding and practice of educational terms such as 'inclusion' and differentiation strategies.

The schools in this research: Palestine School for Girls, Um Ammar School for Girls and Al Qadesiya School for Girls are Cycle 3 schools in Abu Dhabi City. The students are of different nationalities and backgrounds. It had been noted that some students had persistent problems with literacy which was hindering their progress through school. The grades investigated

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(7) New School Model Policy (2010) 7.3 Policy on Grade level Promotion and Retention of Students
(8) Ahmed A. (2009) 'The drive to include pupils with disabilities', The National, 9th May 2011, p6
(9) New School Model Policy (2010) 6.1 Policy on Academic Intervention and Learning Support, Abu Dhabi, ADEC
(10) Doherty, C. (2012), «The educator», Abu Dhabi Week, Feb 23, p.21.

include 10, 11, and 12; these are the grades immediately prior to university level where students are expected to have good levels of literacy and language. Dr Mugheer, Director General of ADEC, has indicated that one future focus, will be a review of Cycle 3 schools[11] provision.

Each school has a committee whose responsibility it is to support teachers in identifying students who may be having difficulties with learning; in identifying probable causes; and in suggesting strategies to teachers, which may enable them to support said students. The Committees are comprised of a 'Lead Additional Learning Needs Coordinator',(ALNCo). representatives from core subjects, Social Workers and the Nurse. The Lead ALNCo from Palestine School has been working closely with CfBT's Additional Learning Needs Partnership Teacher to collect and examine the data concerning language teaching and report on the findings.

Research aims

The research had four main aims:

- To investigate the current understanding of the term 'inclusion' amongst teachers of Arabic and English in Cycle 3 girls' schools.

- To investigate which strategies are in place to support students with literacy difficulties in Arabic and English language lessons.

- To evaluate the perceived impact of strategies which are already in place in Arabic and English language lessons.

- To identify areas for further development of teachers on the inclusion of students with literacy difficulties.

The research examined the levels of understanding of inclusion, differentiation and literacy difficulties of language teachers from 'Anglo-American' and Arabic education systems[12]. The languages investigated were Arabic, which is the first language, and English, which is a second language. The research sought to identify the success of these strategies according to students and teachers and suggests areas where best practice could be shared by language teachers.

Methodology

The methods used included observation of students and teachers in Arabic and English lessons; a focus group interview with a small number of students from each class observed; an individual interview with each teacher observed; and a completed questionnaire from each teacher in the English and Arabic Departments.

The observations were made during lessons where there were most likely to be students with literacy difficulties. Student data was examined prior to the observations so that the class profile was known to the observers. The observers were participant observers as they are part of the staff of each school and known to the teachers and the students. Observer presence in lessons is commonplace and was not viewed as unusual in any way. The whole lesson was observed in each case. The observers were free to walk around the classroom and look at student work. A structured lesson observation sheet was used to collect data, onto which field notes could also be added. The observers were careful not to disturb the progress of the lessons.

(11) Doherty, C. (2012), «The educator», Abu Dhabi Week, Feb 23, p.21.
(12) Dimmock C. and Walker A. (2000), 'Globalisation and social culture: redefining schooling and school leadership in the twenty-first century', Compare,vol. 30, no. 3, pp. 303–12.

The student focus group interviews were conducted as soon after the lesson as the timetable allowed. The groups chosen were random samples as it was not clear from the student data alone which students were experiencing literacy difficulties and any support given may be successfully addressing the difficulty. The focus group interviews were recorded with field notes as this allowed more freedom for random sampling.

The individual interviews with observed teachers were completed as soon after the observed lesson as possible but did not focus on the lesson alone. The interview was semi- structured and allowed teachers to mention anything that they felt was relevant. The questions were open, allowing for an extended response if the teacher felt that this was appropriate. There was no time limit imposed on the interview length. The interviews were digitally voice recorded to allow the interviewer to focus on the teachers' responses.

The questionnaires were completed during the research period and collected over the period of a week.

Key findings

What do English language and Arabic language teachers understand by the term 'inclusion'?

Most teachers demonstrate that they have an understanding of the term inclusion; however there is no universal understanding of the term as defined by ADEC. When interviewed, teachers who have taught in an 'Anglo-American' education system were more able to define the term as: 'all students, regardless of disability, attend the same educational establishment'. Teachers from Arabic education systems were less familiar with the word and as a result were less certain about the definition.

Do teachers see any types of literacy difficulties amongst the students in their classes?

Both teachers of English and teachers of Arabic noticed literacy difficulties amongst students in their classes. These include reading, spelling – particularly of long words – and writing difficulties. In addition, teachers of English notice difficulties with language acquisition, language levels, speaking, grammar and prepositions. Some of these difficulties are considered specific to second language learners.

How do teachers change parts of their lessons to support these students?

Students with literacy difficulties are supported in their English language and Arabic learning in a variety of ways. All language teachers say that they identify the weak students from their written work and their speaking ability. In their classes, teachers differentiate the environment using a positive rewards system, including stickers as a visual reward, and sweets as a tangible reward. All teachers give immediate feedback to students. On occasion students with literacy difficulties are seated next to a well-focused peer. In addition, teachers of English were seen to use ability groups and preferential seating for weaker students. It was observed that teachers of English changed more of the environment to support the learning profile of their classes.

All language teachers support the students with literacy difficulties through instruction (process). Techniques used include: clarification of instruction if necessary; hands on approaches; using different learning styles (visual, auditory and kinaesthetic); modelling of expectations by the teacher and by students; and frequently checking understanding. All teachers interviewed said that they used differentiated worksheets. This was observed in only some English and Arabic lessons. Teachers of Arabic were also observed using: directed questions answered by selected students including those with literacy difficulties; student participation and modelling for the class

by all student abilities; speaking tasks and short timed tasks.

All language teachers used resources to aid learning, including dictionaries and word banks. One Arabic teacher, in particular, used a selection of resources for those with difficulties to signal that they required support. Teachers of English appear to make good use of display boards for modelling the expected student outcomes and for celebrating the work of all students.

Is there any extra-curricular support for students with literacy difficulties?

The amount of support outside the classroom for individual students was limited to the amount of time and dedication a teacher may have available to work with the student. It was noted that teachers will often use their own time and resources outside the classroom to support students with literacy difficulties. In only one school is there a structured activity outside the curriculum designed to address literacy issues, this is in English.

Student response

The students interviewed said that their teachers were patient and they felt that the teachers made adjustments for them. Several, who were aware that they had literacy difficulties in Arabic and English, were grateful for the time and attention that their teachers gave them. Generally, students felt that the support that they received was helping them to improve, although it was recognised by some that they would benefit from further support.

Conclusion

In summary, in the language lessons observed all teachers supported those students perceived to be having literacy difficulties within the classroom environment. The support is seen as being effective by the teachers and very effective by the students. However, examination of student data suggests that it is not effective in every case. Analysis of secondary data suggests that some students show persistent difficulties which remain unaddressed.

It was observed that although all teachers support those perceived as having literacy difficulties, teachers of English are more likely to use more strategies to address needs via environment, allowing for more independent learning: whilst teachers of Arabic are more likely to use strategies which address needs via process (instruction), suggesting that lessons are more teacher-directed. Differentiation by product was by outcome only. Further investigation suggests that the curriculum, at the present time, does not lend itself well to other methods.

All of the teachers interviewed felt that more specialist support in school and more classroom support are necessary for inclusion to be effective. The students interviewed felt that they would benefit from having access to extracurricular 'clubs' during break times, allowing those with literacy difficulties to seek support and practise language learning. Occasionally, those students who are gifted language learners could support their peers and develop their own skills. For example, a gifted student could read text onto tape for a peer to use as reading support. A peer mentoring system could be arranged.

Future development for language teachers could include training them to recognise the nature of literacy difficulties and how to address such difficulties. This could continue to be implemented by the Additional Learning Needs Committee and the school psychologist, in each school, following discussion to examine the exact nature of the difficulties observed. The aim will be to add to the repertoire of strategies used by all teachers.

All language teachers could meet regularly to discuss best practice, and on occasion to observe each others' lessons to enhance their understanding of language learning. Recent research

suggests that differences in the orthographies of the English language and the Arabic language indicate that specific literacy difficulties are manifested in different ways in each language[13]. A case meeting to build a profile of the difficulties a particular student is exhibiting in each language would further support understanding of literacy difficulties amongst teachers of language. This would fully support ADEC's future plans to focus on the development of teachers in order to implement the new school model[14].

(13) Elbeheri, G., Everatt, J., Reid, G., Al Mannai, H. (2006) 'Dyslexia assessment in Arabic', Journal of Research in Special Educational Needs vol 6, no. 3 p143 - 152
(14) Doherty, C. (2012), «The educator», Abu Dhabi Week, Feb 23, p.21.

3.2 Flash literacy

Becky Carswell and Katie McIntosh supported by Fiona Victory and Wedaad Issacs

English scores at Palestine Secondary School are generally high and students tend to enjoy English lessons. That is not to say that there aren't struggling students. After an analysis of baseline test results in English, it became clear that there was a need for literacy improvement. This action research project was undertaken with the hope of finding a way to meet this need.

Improving literacy is an important goal at Palestine School and is a key component of the school's Annual Plan which states an aim to:

Introduce phonics into Grade 10 English for beginner English learners.

Provide ongoing whole-school support on meeting the needs of students, in particular low-achieving students.

Increase the use of English and focus on increasing the students' grammar, vocabulary, and spelling.

The research project was also designed to help teachers meet the needs of the curriculum by helping students achieve success in reading and communicating in English during lessons. It was also hoped that by finding a way to increase literacy, the researchers would be assisted in raising professional standards such as contributing to the learning community and participating in the wider school community.

Research aim

The main aims for this research project were to:

- Engage students in short reading and speaking activities (15-20 minutes, two times per week)

- Increase the status of English around the school and motivate students with developing abilities to attend additional literacy sessions regularly

- Show results of an increase in literacy skills.

In order to achieve these research aims, the following research questions were investigated:

RQ1. What kinds of literacy activities can be effective in a 15-20 minute session?

RQ2. How can students be motivated in developing abilities to improve their reading and comprehension skills?

RQ3.How can the intervention help to improve and measure reading and comprehension skills in students with developing abilities?

Methodology

In order to address the aims of the research project, an intervention was designed and a target group of students was identified.

Participating students

Students were assessed in English reading and writing and their scores were recorded as a baseline measurement. Students who scored lower than seven were selected to participate in the intervention, as were students specifically identified by teachers as having low literacy skills

following classroom observations.

The intervention

As there was very little free time in which to introduce an intervention, students needed to be convinced to attend extra sessions during their morning break. Students were asked to attend two sessions a week for 15-20 minutes. During this time they participated in reading and speaking activities. As these were just short bursts of literacy, the intervention was titled "Flash Literacy".

The research approach

A mixed methods approach was used, utilising qualitative and quantitative methods and primary and secondary data. Specifically, the following methods were used:

A literature review to help understand the topic, acquire background expertise and design effective "Flash Literacy" activities.

Interviews with regularly participating students at the beginning of the program to find out their attitudes toward reading, speaking and understanding English.

Surveys with regularly participating students regarding their feelings toward English, reading in English, and comfort in English lessons once every few weeks.

Interviews with teachers of regularly participating students regarding the students' abilities and limitations in English class.

Results and analyses of baseline English tests as compared to Trimester 1 and 2 grades.

Key findings

RQ1.   What kinds of literacy activities can be effective in a 15-20 minute session?

After the first Flash Literacy session it was clear that many students had a basic understanding of phonics, but had difficultly putting words together quickly and fluently. The literature suggested that developing reading fluency and comprehension is very difficult without first developing fast and accurate word recognition skills (Takuchi, Takayasu-maass, Gorsuch, 200415). For this reason, it was decided to begin with the Repeated Reading technique (RR), where students

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(15) Taguchi, E., Takayasu-Maass, M. & Gorsuch, G.J. (2004). Developing reading fluency in EFL: How assisted repeated reading and extensive reading affect fluency development. Reading in a Foreign Language 16 (2). http://www.nflrc.hawaii.edu/rfl/October2004/taguchi/taguchi.html

read a passage several times with the end result being that the last time they read the passage will be faster and more accurate than the first time they read it. Full comprehension was not the goal at this time.

In a survey of the participating students, it was found that students enjoyed this approach and that their confidence increased through reading same text two or three times. However, in a survey of teachers, it was reported that this confidence did not necessarily translate into the classroom.

RQ2. How can students be motivated in developing abilities to improve their reading and comprehension skills?

At the beginning of the program, approximately 30 students were identified who scored lower than seven out of 25 on the baseline tests. Unfortunately, the biggest challenge encountered throughout this study was getting students to participate. More students attended at the beginning of term and from this it was concluded that the students were unwilling to give up their free time closer to the exam period.

With the few students who participated throughout the program, self-reflection and periodic surveys were used to help them monitor their own progress, which it was hoped would motivate them to continue to participate. However it was concluded that for the success of this program in the future, we will need to experiment with alternative methods of motivating students.

RQ3. How can the intervention help to improve and measure reading and comprehension skills in students with developing abilities?

Improvement in reading and writing skills were measured by comparing Trimester 1 and 2 marks and by interviewing each student's English teacher. For each student who participated regularly, we saw a slight increase in marks from Trimester 1 to Trimester 2. Teachers reported students to be more willing to approach the teacher in English or to read and answer questions one-on-one, but still showed reluctance in participating in class activities and discussions.

Conclusion

It was felt that the Flash Literacy program was a very useful research project for Palestine Secondary School. It proved that there is a need for literacy improvement and set forth a challenge to meet it. While the results do not necessarily demonstrate success on a school-wide scale, it was felt that lessons were learnt about the students' needs, reading techniques that improve literacy and the challenges of finding free time for extra-curricular activities.

The next steps will be to find a way to get all students with developing abilities involved in increasing literacy. The researchers are currently working on implementing an in-class support program where an additional teacher can go to classes for a short time each week to engage in Repeated Reading (RR) activities with students with developing abilities. They have also implemented a library period each week to foster a love of reading amongst students and give teachers a chance to do RR activities with students with developing abilities while others are engaged in reading.

In conclusion, this research project demonstrated that Flash Literacy can work, but it must be made a part of regular class time in order to ensure maximum participation from all those who need the extra help.

3.3 Why are students unwilling to read in Arabic?

Montaha Al Zaghal and Nujood Al Masafaah supported by Fiona Victory and Susan McKenna

Reading is an important aspect of learning. Many students at Palestine School have weaknesses in their writing which is related to their reading habits. This research project aimed to support the students to read more.

This research project is important for Palestine School because it will help to achieve some of the goals listed in the school plan, such as to 'increase the non-fiction resources and computers to develop research options in the Learning Resource Centre' and to 'maximise the use of the Learning Resource Centre in the teaching and learning process'.

Research aims

The main aim of this research project was to investigate the reasons why students at Palestine School do not read in Arabic and to provide an opportunity for the students to express their opinion on the best method to encourage them to read more.

In order to reach these objectives, the following research questions were addressed:

RQ1   Why do students not like reading?

RQ2   What do students read?

RQ3   When do students read?

RQ4   How can the Learning Resource Centre be used to encourage students to read more widely?

Methodology

The research project focused on one class in grade 10 and one class in the grade 12. At the beginning of trimester 2 a baseline questionnaire was administered to students to find out about their reading habits. An intervention was then implemented where:

- An agreement was made with the school librarian to facilitate borrowing books from the Library; students would be able to borrow more than one book at a time if they wanted to

- One lesson each week was held in the library for a free reading session.

- Students completed a reading diary and made notes about what they had read at the end of each free reading lesson.

At the end of trimester 2 a second questionnaire was administered to students to evaluate the effectiveness of the intervention.

Key findings

Prior to the intervention, most students said that they liked reading and they reported that they read a wide range of materials. However, some students said that they had no time for reading and others that they did not have anything to read, or that the books in the library were boring.

Following the intervention, students reported that they enjoyed their free reading and wanted to have more than one lesson a week in the library. The most common response from grade 10 students was that they found useful information and new terms. The most common response from grade 12 students was that they found expressions that they could use in their writing.

Teachers noticed a general improvement in students' written work and many of the students showed a great improvement in the style of their written work. For example, they used more metaphors.

Conclusion

The research revealed that one of the main reasons that students do not read is a lack of free time. The students have a heavy load of school work and test preparation and when they do have free time they prefer to spend in using the internet, watching television, or meeting with their friends. Giving the students a special time just for reading helped them to read more.

The results from the research project are promising. Most students showed an improved level of responsibility improved throughout the trimester; when they went to the library, they chose a book straight away and sat down to read and at the end of the lesson they made notes in their reading diary without being prompted. Improvements were also seen in students' written work, which could be attributed to their extra reading. Some of the changes were small but in a few cases the difference in quality was surprising.

3.4 Using audio technology to improve speaking and listening

Mohammad Al Zaidi and Mahmoud Wishah

Now in its final year as a Cycle 3 PPP school, Khalifa Bin Zayed Secondary School (KBZ) is working towards not only sustainability, but the use of electronic resources in order to ensure that changes brought in to the school are the ones that are embedded in the school's teaching culture. In previous years, much had been achieved in terms of improving classroom practice and developing pedagogical approaches but the use of software technology as an educational resource is still in its early stages. The school is located in an affluent residential area of Abu Dhabi were parents frequently visit the school and where emphasis on learning a second language is very important in order for students to continue their university education.

To learn to speak a second language is hard enough when you try to do so in a native country, so you can imagine the extra difficulty when learning a foreign language in your home country. To be able to learn to speak and understand a language takes considerable time and effort.

Research aims

This research investigates the importance of integrating ICT into learning to speak foreign languages. The focus of the research was to investigate how audio/video could be used as a tool to improve student learning, to improve the quality of teaching and to assess the impact this would have on student achievement and motivation. The main aims of the research were to:

- Analyse student evaluation of the use of audio technology in the classroom.

- Investigate how audio technology affects students' spoken skills.

- Measure student achievement in relation to the use of audio/video technology and how this approach affects their way of learning.

In order to achieve these aims, the following research questions were addressed:

RQ1 What are student's views on using audio technology in the classroom?

RQ2 How does audio technology impact on students skills in speaking and listening?

Methodology

Varied methods were used in order to address the aim of the research including:

- Workshops with students on the action research aims and methodology.

- Questionnaires and open discussion with students and teachers respectively.

- The analysis of comments made by students on the use of technology in the classroom as a method of learning.

Key findings

Students reported that they felt it was of benefit to use audio/video technology while being taught speaking and listening. In the overall evaluation of the lessons, 86 per cent of students agreed strongly that using multimedia would be beneficial to them as it was different to their traditional lesson, and it offered an independent way of learning. Three quarters of the students surveyed thought that this was a productive way of improving their speaking and listening skills in English in the long term and when asked if they found the use of multimedia classes kept them focused for longer when compared to a typical speaking and listening lesson in the classroom, 70 per cent of students agreed.

Students reported using audio technology such as iPods and mobiles both inside and outside of the classroom to practice English to develop their speaking and listening skills. From the discussions it was clear that a short listening session of around 15-20 minutes at a time was felt to be more beneficial than having long sessions. The advantage of using such technology gave students control of the learning process both inside and outside the classroom during and after school.

At the end of the research, students were asked if they believed that using audio/video technology helped them to improve their language and speaking skills, all of them agreed. They said that it helped them develop the skills more quickly, helped them to practice and made learning interesting. In addition, teachers were also aware that the use of technology would enhance their lessons and this would help with behaviour issues in the classroom; however they reported that a lack of IT facilities, software and equipment and some teacher's level of ICT could be barriers.

Conclusion

The overall purpose of this research was to investigate whether multimedia technology can be an effective tool in the classroom to improve speaking and listening when learning a foreign language. Based on the student's questionnaires, open discussions and observations it was found that there are a number of strategies that schools and teachers in general can put in place:

- Use the ICT available, including technology that learners carry, such as mobile phones.

- Using e-learning requires ICT skills. Learning something through ICT will also develop ICT skills and gives a clear purpose for that learning.

- Schools should generate interest by showing learners and teachers how ICT is used in the workplace.

- Teacher professional development in the use of technology must be given the priority and resources it deserves.

- The potential of technology as a medium for delivering CPD can improve teaching by

providing access to better educational resources and offering multimedia simulations.

In conclusion, the overall feedback shows that students believe that using technology, especially using educational multimedia technology tools such as audio/video helps them to improve their speaking and listening and communication skills. For teachers this is another tool to keep students motivated, improve behaviour, student achievement and ICT skills.

4. School organisation

4.1 Creative techniques for improving students' behaviour

Mariam Al Tiniji and Katie Zawaideh

Managing students' behaviour is always a top priority for teachers in today's schools, yet more and more educators are finding it challenging to change students' behaviour. This research has been done in Palestine School in Abu Dhabi. This research is important to the school because, as stated in the Palestine School Annual Plan, there is currently a drive to 'improve student behaviour... All staff is to enforce consistently the expected high standards'[16].

Research aims

This research aimed to investigate creative techniques for improving students' behaviour. Three interventions were trialled, they were to:

• Increase student motivation by improving classroom environment

• Improve student diets by promoting fruits with fun pictures

• Improve parents' attendance at school meetings by engaging them in fun activities.

Therefore the questions which this research aimed to answer were:

RQ1   Will the interventions increase students' motivation in school?

RQ2   Will the interventions improve students' choice of food?

RQ3   Will the interventions increase parents' involvement and attendance for meetings?

Methodology

A baseline measurement was taken and a range of interventions were initiated using an action research methodology. Interventions were trialled on a sample of two grade 12 classes. Each class contains 27 girls aged approximately 17.

Will the interventions increase students' motivation in school?

In preparation for the study, the two classes were observed over a two weeks period. Then the observer recorded the following

(16) Palestine School Annual Plan for 2011 - 2012

information after the classes have been decorated:

- How motivated the students were in the lessons when they were first surprised by the displays
- How this affected their motivation and engagement in the lessons
- How long this motivation lasted

A survey was also conducted of the students in the classes and a follow-up observation was conducted two weeks later.

Will the interventions improve students' choice of food?

Students were observed to find out what kind of food they eat and a questionnaire was completed by the canteen sales person on the amount of fruit sold in two weeks. This was repeated after the intervention.

Will the interventions increase parents' involvement and attendance for meetings?

Parents' attendance was compared before and after the intervention.

Key findings

Will the interventions increase students' motivation in school?

Eighty-eight per cent students reported that the new class environment positively affected their motivation to study. The teacher suggested that displays need to be changed and updated frequently as students became familiar with them.

Will the interventions improve students' choice of food?

Before the intervention, the observation and analysis of amount of fruit sold in the school canteen suggested that students do not choose healthy food. Directly following the intervention, the number of apples sold increased. However, after a few days the number of apples sold decreased.

Will the interventions increase parents' involvement and attendance for meetings?

Following the intervention, parents' attendance for meetings that involved activities for both parents and their daughters were higher than 'normal' meetings. Parents even asked for more opportunities for their daughters to meet after school hours for activities with purpose. They appreciated the initiatives taken in school to get them involved.

Conclusion

The research investigated creative techniques for improving students' behaviour. Three interventions were trialled, they were to:

- Increase student motivation by improving classroom environment
- Improve student diets by promoting fruits using fun pictures
- Improve parents' attendance at school meetings by engaging them in fun activities.

The research measured the students' responses to these small interventions and revealed that the creative techniques can change behaviour for the better.

One issue that became apparent through the research was that none of the interventions appeared

to induce long-term change. That is, once the person is habituated to the creative technique, it no longer impacts their behaviour. Therefore, in order to maintain affective interventions, new activities need to be regularly created

Based on these research findings, the following evidence based ideas are suggested:

- Stimulating classroom displays to motivate students should be changed every two weeks.

- To encourage healthy food choices, find creative ways to present healthy food in school canteens. Be innovative every time.

- For more parent and community involvement, organise parents meetings with activities that motivate parents to engage more in schools for better attendance.

4.2 Stakeholder survey of effective school practice

Nabil Al Shaalan and Arne Bergh

1.1 Introduction

As part of the ADEC education reform in the Emirate of Abu Dhabi, there is a strong focus in developing practices and processes at Abu Dhabi Secondary for Boys – Cycle Three. This research aims to explore stakeholder understanding of practice. The school has a roll of 522 students of whom approximately 40 per cent are Emiratis and the remainder originates from the MENA region. The school's 45 teachers are from the MENA region except for six English Medium Teachers who are western expatriates and three Emirati teachers. School leaders are is Emirati. The students are fluent in Arabic with English their second language.

1.2 Research aims

The main aim of the research was to determine stakeholder perception of effective school practice. In order to achieve this aim, the following two research questions were investigated:

RQ1   What are stakeholder perceptions of effective school practise?

RQ2   To what extent do stakeholders vary in their view of what constitutes effective school practise?

1.3 Methodology

In order to address the aims of the project quantitative data was collected through a questionnaire. Questionnaires were distributed to three school stakeholder groups:

- school leaders and teachers;
- students
- parents

Stakeholders were asked whether they 'strongly agreed', 'agreed', 'neither agreed nor disagreed', 'disagreed', or 'strongly disagreed' with 10 statements:

1.4 Key findings

Questionnaires were completed by 46 school leaders and teachers; 220 parents and 296 students.

The data collected from the questionnaires suggested that the majority of stakeholders shared the same vision of what was effective school practice. As might be predicted, the school leaders and teachers had the better understanding followed by parents and student groups.

Responses to the questionnaires reveal that a majority of stakeholders understand what effective school practice looks like. As might be expected, the leaders/teachers group had the best understanding followed by parents and student groups.

The survey groups mainly agreed with the following statements about indicators of effective schools:

- Distributive school leadership is required

- Effective schools promote inclusion for students with special educational needs
- School data analysis is a useful school improvement tool
- Standardised student assessment provides reliable data on performance
- Learning time is maximised
- Parents and school form a strong partnership
- Students successes and styles of learning are valued – not just reproducing knowledge
- Student expectations and standards are high.

The areas where the lowest levels of understanding were demonstrated were related to lesson differentiation and student centred teaching.

1.5 Conclusion

The results from the questionnaire on effective school practices and suggest that all stakeholders in the Abu Dhabi education system have a good understanding of effective school practices. In relation to the classroom practice, a significant result from the teachers' responses demonstrated a clear understanding of the need for student centred learning for effective teaching and learning. It can be concluded that the professional development training together with coaching and mentoring practices provided by the operator team, has contributed to this view.

Both the parents and students mainly held the opposite view of the role of the teacher and next steps would be to continue with the parent programme to be partners in their child's education and increased understanding of how to support effective learning. Also, further work with students to reflect on their learning styles and the role of interactive learning to promote strong foundations and consolidated learning.

4.3   Can the development and implementation of a student data tracking system impact on departmental awareness and departmental sense of team?

Anda Lucia supported by Wafa Al Ansary

2.1 Introduction

This research project investigated team dynamics in one department at Um Ammar Secondary School for Girls. The project evolved as a way to address these main issues:

- The head of department wanted teachers to operate more as a team

- The head of department wanted members to communicate formally, regularly and improve departmental information sharing

- There was no system to record, to track and to share data on student underperformance, lateness, absenteeism, or poor behaviour.

2.2 Research aims

From these issues the following research aims and research questions evolved.

Research aims:

- To implement a data collection system encouraging department members to come together and work as a team around common goals;

- To establish weekly department meetings to improve communication

Research questions:

RQ1   Can a departmental tracking system:

   a.help teachers increase their knowledge of students?
   b.help teachers develop practice?
   c.bring individuals together creating more of a team?

RQ2   Can a data collection system increase teacher knowledge of all students in the school thereby allowing them to take action; action which would improve student outcomes?

RQ3   Will this data collection system encourage teachers to share information and collaborate around students?

2.3 Methodology

Near the end of the Term 1 a questionnaire was administered to collect baseline data. Six of the eight department teachers, including the head of department, took the survey.

A Student Data Tracking System was then introduced. This system required teachers to record attendance and behaviour, note underperformers, as well as to trend and follow up on all identified students. If a student was late, was absent, was underperforming and/or had behaviour issues. These students were then entered into the Teacher Action Log and discussed at the departmental meeting.

A follow-up questionnaire was then conducted.

2.4 Key findings

The baseline survey showed that teachers felt that they were part of a team or department. They reported that they felt confident in their knowledge of the students who were in their classes, but less so of those that weren't. Overall, they reported that they anticipated that sharing knowledge about all students would help to build a sense of team, and enable individual teachers to become more knowledgeable about particular students.

Following the intervention, teachers reported immediate results in their students: students started to attend their classes on time, missed less Continuous Assessments and performed better when they knew the teacher was tracking them and holding them accountable.

The follow-up questionnaire revealed an increase in the sense of 'team' that each department member felt as a result of working with other team members around common students and the student body as a whole. Teachers reported a slight increase in their knowledge of their own students and a large increase in their knowledge of all students as a result of sharing information at department meetings. The teachers also reported a large increase in the level of departmental communication.

As a result of their actions around students, the Science Department is now identifying and facilitating the transfer of information about high and low ability students to the Additional Learning Needs team, where further action is taken.

2.5 Conclusion

Following the research project, the department will continue with the data tracking system and hope to share this system with other departments. The research has shown that the Student Data Tracking System leads to better communication and supports teachers when dealing with parents and students.