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Impact of training through long-term in-service programmes on teachers' practices – The case of Oman

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Abstract

This large-scale research was conducted to measure the impact of training of long-term in-service programmes that last for between one, and two and a half years. The research aimed at identifying the changes that occurred in teachers' knowledge, skills, attitudes and values. It also aimed at determining the impact of trainees on teaching and learning process in schools, and their impact on the school community as a whole. This research was conducted in cooperation with the Finnish University of Turku to ensure research quality and commitment to internationally recognised scientific research methodologies. The research instruments varied between qualitative and quantitative. Several instruments were implemented including: classroom observation, interviews with school principals, surveys of school students and self-assessment surveys by trainees. One of the most important findings of the research in general was the positive impact of training at The Specialised Centre for Professional Training of Teachers. The positive impact appeared in improving the teaching practices among the trained teachers compared to those who did not undergo training in the Centre. The trainees were also more conducive to improving students' attitudes towards learning. The findings also revealed that female trainees are more involved in improving the quality of teaching and the most influential in their colleagues' behaviour and their students' attitudes towards learning. The research recommended activating the research findings in evaluating the Centre's nine long-term programmes and using the results to contribute to these programmes' future developments.

Keywords: teachers; professional development; trainees; measuring impact; change

Introduction

In international comparisons, the development of Oman's education system in terms of the increase in student enrolment rates and in improvements in the level of teacher qualifications has been remarkably rapid. A report from the World Bank in 2001 described the development of Oman's education system between 1970 and 2000 as "unprecedented" and "unparalleled by any other country" (World Bank, 2001). However, although Omani education policy has expanded access to education, it has been less successful in improving the level of learning. Learning outcomes lag behind the international average as revealed in international assessments, such as TIMSS and PIRLS conducted by *The International Association for Evaluation of Educational Achievement* (IAE 2012a; 2012b; 2016a, 2016b), and there is a significant gender gap with girls outscoring boys on all measures.

Another World Bank report *The Drive for Quality* (2012) suggested two main priorities for Omani education: (1) creating a culture of high standards, and (2) developing the pedagogical capacity of the teaching force. One of the areas the report suggested addressing to enhance pedagogical skills was focusing the in-service training on teaching skills for quality learning and supporting teacher-peer activities. Consequently, the Ministry of Education in Oman has taken several policy measures aiming at improving the effectiveness of the education system including the development of curriculum and performance standards.

For teacher training, there have been three long lasting challenges: teacher preparation does not produce the skills needed in teachers, the quality of newly graduated teachers is very heterogeneous, and in-service training has been sporadic and poorly planned (Al Jabri, Silvennoinen & Griffiths 2018). In an attempt to tackle these challenges, recently four new national institutions have been established including *the Specialised Centre for Professional Training of Teachers* (SCPTT).

The SCPTT is responsible, nation-wide, for the in-service training of teachers and other education professionals in the Sultanate (Al Jabri, *et al.* 2018). The Centre aims to develop the skills and confidence and motivation levels of educators and administrators by providing them with sustained, intensive professional development. SCPTT started providing in-service training for teachers in 2014. The SCPTT programmes are designed according to actual training needs of teachers, senior teachers, school principals, and supervisors in order to help them provide schools with a better learning environment (MoE, 2013). These programmes have been designed based on the research findings provided by national and international studies: e.g., low student scores in TIMSS and PIRLS were the main impetus for the programmes for teachers in maths, science, Arabic and "Field 2", which refers to teachers who teach both science and maths in cycle 1 schools, grades 1- 4 students aged between 6 to 10 years.

At SCPTT, educators get professional development training on different aspects that target their subject matter or work-related topics. All programmes include training for 21st century skills, higher order thinking skills, reflection, collaboration and up-to-date

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effective methods of teaching. SCPTT includes main principles in the programmes such as knowledge, qualities, values and professional skills that are embedded within its elements of training; face-to-face, online learning and work place learning tasks. (Al Shabibi & Silvennoinen, 2018; Al Jabri *et al.*, 2018). It is recognised that it will take time for the expected improvement in training to impact on learning outcomes, but in this research we aimed to examine whether there has already been any changes due to teachers' participation in the newly organised in-service training.

This large-scale research was conducted to measure the impact of training of five long-term in-service programmes of between one, and two and a half years. The research aimed at identifying the changes that occurred in teachers' knowledge, skills, attitudes and values. It also aimed at determining the impact of trainees on teaching and the learning process in schools, and their impact on the school community as a whole. This research was conducted in cooperation with the Finnish University of Turku to ensure research quality and commitment to internationally recognized scientific research methodologies. The research instruments varied between qualitative and quantitative. Several instruments were implemented including: classroom observation of 432 teachers, interviews with 251 school principals, surveys for 6,000 school students and self-assessment surveys by 367 trainees. Relatedly, four research studies evolved depending on research data. The four related studies are described and discussed below.

Study 1: Impact of Teacher Professional Development on Student Attitudes to and Experiences in School Learning

Introduction

The ultimate goal of teacher professional development is to improve students' learning skills and learning outcomes. Guskey, for example, in his introduction to International Handbook on the Continuing Professional Development of Teachers (Day and Sachs, 2004) comments that several authors in the book '…argue that the purpose of professional development is to deepen teachers' knowledge, strengthen individual practice and build collective capacity for the improvement of teaching and learning at the school level…'. Students are seen as the end users of teaching and education. Thus, it is of utmost relevance to get information on how students experience the teaching of teachers who have participated in professional development and in-service programmes. In this study the impact of participation in teachers' in-service training is examined in Omani schools. The study sample consisted of 6000 students: 3176 students of teachers who had participated in in-service training, and 2824 students of teachers who had not received such training. The student questionnaire was designed to provide insight on how the training received by a teacher is reflected in student attitudes towards learning and schooling. An independent sample t-test was conducted to determine if there were differences in attitudes towards learning between students of

trained teachers and non-trained teachers. The results show statistically significant differences between students' attitudes in favour of students of trained teachers.

Omani students at grade 8 participated in science and mathematics in the 2007 TIMSS study, and at grades 4 and 8 in both subjects in the 2011 and 2015 studies. A comparison of results between 2011 and 2015 showed a significant improvement in Omani students' skills and understanding in maths and science (IEA 2012b; 2016a). For example, in science at grade 4, the average proficiency of Omani students increased by 55 score points between 2011 and 2015 (the fourth largest improvement among participating countries) while at grade 8, the scores increased by 35 (the fifth largest improvement). Maybe these improvements give an early indication of the gains that the recent nation-wide reforms will produce. However, despite the positive progress in TIMSS test scores, Omani students are still significantly under-performing against international standards. Far greater improvements are required to bring Omani student performance in-line with international standards.

Moreover, in Oman (as well as in numerous other countries) boys have much more to do to improve than girls since girls continue to outperform boys (Logan & Johnston 2010). Along with the general low performance, the gender gap is an issue of great concern in Omani education policy. In mathematics in 2015, the gap between the performance of girls and boys at grade 8 was the largest (32 points) of all the 39 participating countries, and at grade 4 the second largest (21 points) of the 49 countries. However, the University of Cambridge report *Review and recommendations* (2010: 25) acknowledged the positive attitude of Omani students to their learning by reporting that Omani students *"… are diligent, respectful and clear in their answers of questions; behaviour in class is excellent and relationships between teachers and students are also extremely good"*. Omani children enjoy going to school.

Although student engagement levels have been identified as an academic challenge in Arab Gulf nations (Ashcraft 2007; Engin and McKeown 2012), it has attracted little in the way of research. A number of studies have demonstrated that this phenomenon is also to be found in Western settings, and they have reported a gender gap in student engagement, with young males appearing to have lower levels of engagement than females (e.g. Lam et al 2012; Martin, 2004). In the Omani context, as mentioned above, there are significant gender differences in student achievement, with girls outperforming boys on all measures of students learning outcomes. In terms of engagement, the World Bank Report (2012) commented that these performance differences can be traced to a number of factors. (1) There are differences experienced by girls and boys in both the home and school environment. (2) Girls generally use their time at home more effectively in preparation and studying in comparison to boys. Compared to boys, grade 8 girls tend to spend less time watching television, videos or playing computer games, and more time reading books for enjoyment or doing

homework. (3) Despite their poor results, boys do not lack self-confidence in their abilities. Boys may think that they are better than they actually are and therefore might not feel a need to improve their performance.

According to Martin and Dowson (2009), recent research reviews highlight the need for teacher professional development to assist disengaged and disadvantaged students by targeting key areas such as improving teacher-student relationships since the evidence suggests that students' feeling of acceptance by teachers are associated with emotional, cognitive and behavioural engagement in class.

Research Questions and Methodology

This study examined the possible changes in pupils' attitudes to, and experiences in, school learning as a result of their teachers having attended in-service training. Attitudes of two groups of randomly selected pupils were compared: pupils whose teachers had participated in in-service training and pupils whose teachers had not participated.

Research questions

This study aimed at answering two questions:

RQ1. How do Omani pupils relate to learning and teaching in schools, and do their attitudes and experiences vary by teachers' participation in in-service training?

RQ2. What are the differences in attitudes and experiences by pupils' and teachers' gender?

Data and participants

The data were collected on five programmes conducted at SCPTT, i.e. Arabic experts, Science, Mathematics, New Teachers and Centre Associates (which is for senior teachers). The data were collected from Cycle 1 (Grades 1-4, ages 6-9), Cycle 2 (Grades 5-10, ages 10- 15) and Post Basic schools (Grades 11-12, ages 16-18) from across Oman. The sample of the study consisted of 6000 pupils: 3176 students of trained teachers (1642 male and 1534 female students), and 2824 students of non-trained teachers (1425 male and 1399 female students).

Instrument

A structured questionnaire with twelve questions, with Likert scale to provide a number of responses in each question, was used to collect data. In the questionnaire each question contains statements to which the participants indicate their agreement or disagreement using a three-point Likert scale, ranging from never (1), sometimes (2), and always (3). Unlike the conventional Likert scale, we used Visual Analogue Scales (VAS) to identify the students' feelings. This question format can be used with open-ended and closed questions (Read and Fine 2005). Images of face expressions

('smileys') were used in the questionnaire to make it easier for Cycle 1 students to respond.

Results and discussion

Liking School Learning, Engagement in School Work and Confidence in Learning

When presenting the results, the 12 items are grouped in three categories: pupils' views on liking school learning, pupils' views on classroom engagement and pupils' confidence in learning. Regarding liking school subjects, more than 70% of Omani pupils stated they always enjoy learning their subjects (see table 3, item no. 1). Compared with the results of Omani grades 4 and 8 pupils in mathematics and science in TIMMS, about 70% of the grade 4 pupils and 39% of grade 8 pupils very much like learning mathematics (IEA 2016a). Moreover, according to TIMSS results 74% of grade 4 pupils and 51% of grade 8 pupils very much like learning science (IEA 2016b). Working with classmates is much more popular than working individually. 75% of pupils always enjoy working with classmates, while 20% never enjoys working individually.

Items in category two indicate pupil engagement. Almost 70% of pupils get the opportunity "to discuss her/his learning activities more than just answering teacher's questions" and "to express her/his opinion, to discuss and to participate in the work" while doing group work.

Regarding confidence in learning, approximately 60% of Omani pupils feel very confident in school leaning. On the other hand, 50% of Omani grade 4 pupils and 31% of grade 8 pupils are very confident in science according to the TIMSS results (IEA 2016b).

Students' attitudes and experiences by teachers' gender and participation in training

In general, pupils of trained female and trained male teachers tend to feel more engaged in teaching than pupils of non-trained teachers. Pupils of trained teachers are more often taught by more active learning strategies which encourages them to be engaged in the whole lesson. The results of cross tabulation on gender differences between male/female and trained/non-trained teachers in individual items show that there is a clear gender effect in students' attitudes; students of female teachers showed consistently more positive attitudes than students of male teachers. Regarding training, there are substantial differences in attitudes between students of trained and non-trained teachers. In the case of female teachers, these differences are in favour of trained teachers more consistently than in the case of non-trained teachers. Students of trained female teachers reveal more positive attitudes in all items. In the case of male teachers, the difference between students' attitudes of trained and non-trained teachers is slightly in favour of students of non-trained teachers.

Students' gender and teachers' participation in training

A two-way ANOVA was conducted to examine the effects of students' gender and teachers' training on students' attitudes. The interaction effect between students'

gender and teachers' participation in training on students' attitudes was not statistically significant, $F(1, 5596) = 2.373$, $p = 0.124$, partial $\eta 2 = .000$. Therefore, an analysis of the main effect for students' gender was investigated, and it indicated that the main effect was statistically significant, $F(1, 5996) = 194.97$, $p < 0.001$, partial $\eta 2 = .031$. Female students (M = 2.5, SD = 0.23) had more positive attitudes towards learning than male students (M = 2.46, SD = 0.27).

There were also statistically significant effects of teacher's participation in training on students' attitudes towards learning $F(1, 5996) = 6.499$, $p = 0.011$, partial $\eta 2 = 0.001$. Students of trained teachers (M = 2.51, SD = 0.25) showed more positive attitudes towards learning than students of non-trained teachers (M = 2.49, SD = 0.26).

Teachers' gender and participation in training

A two-way ANOVA was run to investigate the effects of teachers' gender and their training on the attitudes of students towards learning. There was a statistically significant interaction between teachers' gender and training on students' attitudes, $F(1, 5996) = 13.204$, $p < .001$, partial $\eta 2 = .002$. The results indicated that for both trained and non-trained teachers, students of female teachers showed more positive attitudes than students of male teachers.

Conclusion and Implications

According to results from the TIMSS and PIRLS international assessments, pupils in Oman tend to have positive attitudes towards schooling and learning but, at the same time, perform poorly in mathematics, science and literacy. Thus, there seems to be a serious discrepancy between learning attitudes and learning outcomes. Due to low participation rates in early childhood education as early childhood education is not yet compulsory in Oman, Omani pupils have spent less time in formal education compared to pupils in most other countries. Low performance levels in international tests can have a detrimental effect on the future economic wellbeing of the country and is, therefore, a major concern for Omani education policymakers.

The results showed that female pupils have more positive attitudes towards learning than male pupils. This result is consistent with McGeown et al. (2015), Nickerson and Nagle (2004), Tinklin (2003), and Verkuyten and Thijs (2002). Indeed, in most countries participating in PISA, TIMSS and PIRLS, the percentage of girls with positive attitudes towards schooling is much higher than that of boys. The difference between boys and girls in liking or disliking school has been known for decades (e.g. Tenenbaum 1944).

The results from our questionnaire show that teachers who have recently participated in TPD contribute positively to pupils' attitudes to schooling and learning. Most likely, participation in the training programmes provides teachers with additional skills and active learning strategies focusing on pupils. This reflects positively on pupils'

attitudes. This is in line with the results of Piwowar, Thiel, and Ophardt (2013). This new knowledge also works as a source of energy and excitement that the teachers then bring into their classroom and is transferred to students.

Moreover, the study revealed that pupils of female teachers show more positive attitudes than pupils of male teachers - regardless of whether the teacher has participated in in-service training or not. This might be explainable by the fact that female teachers are more interpersonally oriented and more focused on how pupils feel or process the materials, whereas male teachers are more task-oriented as they focus on delivering the materials and they think that their job finishes as soon as pupils complete the tasks (Eagly and Johnson 1990; Queller 1997).

Unexpectedly, male students whose teachers had participated in training hold more negative attitudes towards their schooling than students whose (male) teachers had not undergone training. This finding might be explained in different ways. It might be that male teachers are failing to implement the desired changes in their classrooms (Al-Maskri, Al-Mukhini and Amzat 2012). This might imply that the training programmes are facing challenges to engage with male teachers. It could also be that male students are reacting negatively because they feel uncomfortable with the new methods and activities their teachers are introducing. Another explanation could be the fact that boys are generally less positive than girls about school (e.g. Lam et al 2012).

All in all, teachers' training proves to be effective in changing pupils' attitudes towards learning. Yet, the planning of TPD programmes need to focus more on the strategies targeting male teachers and to deal with the gender differences in the programme materials.

Study 2: Teachers' self-assessment of the level of competencies according to gender and teaching experience

Introduction

Teachers' knowledge and training have been a real concern in several educational contexts across the world (Borg, 2006; Alarimy, Othman, Ali & Ahmad, 2015; Alkharusi, Kazem & Al-Musawai, 2011; Al Shabibi & Silvennoinen ,2018; Roeser, Skinner, Beers & Jennings, 2012). However, teachers who have received in-service training show higher competence, higher levels of perceived skills, knowledge and attitudes toward different subject matter (Alkharusi, Kazem & Al-Musawai, 2011; Alkharusi, Aldhafri, Alnabhani, & Alkalbani, 2012).

Self-assessment plays an important role in teacher professional development (Towndrow, & Tan, 2009; Borgmeier, Loman & Hara, 2016). By using self-assessment this study investigates teachers' competences in the areas of teachers' professional qualities, knowledge and understanding, and professional skills. The data were collected by self-assessment of 368 teachers in Oman. Results show that female

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teachers surpassed their male counterparts in the three areas in terms of their attitudes towards cooperation with colleagues. Furthermore, the results show significant differences between teachers in professional skills in terms of feedback and assessment skills with regard to number of years of teaching experience.

Study problem

In this study, the competence level of Omani teachers was examined by using self-assessment. The focus was on the association between gender and amount of teaching experience, and competence level.

Study objectives

The main aim of this study was to examine the competences of Omani teachers as assessed by the teachers themselves.

Study Questions

How do teachers assess their competence at present, and what are the differences in competences by gender, and teaching experience?

Study importance

Self-assessment tools are considered by some researchers as the most appropriate methods of data collection for certain purposes such as reflections and learning purposes (Avalos, 2011; Blank, Rolf, Porter & Smithson. 2001; Ross, 2006). Some researchers consider self-assessment as a way to professional growth and self-improvement as it is under full control of teachers in identifying their own abilities and beliefs (Airasian & Gullickson, 1994; Alkharusi, Aldhafri, Alnabhani, & Alkalbani, 2012; Alyahmadi & Al-Kiyumi, 2014; Ross & Bruce, 2007).

Study approach

The study used a quantitative approach to answer the research questions.

Study sample

A total of 368 teachers responded to the survey after having attended in-service-training provided by the SCPTT. The data were collected in 2015 and 54 % of the respondents were female. Teachers were asked about their teaching experience with a four point scale question, 1) 1-2 years, new teachers, 2) 2-7 years, 3) 8-12 years, and 4) over 12 years. Because there were only 15 respondents in the first group, the groups 1 and 2 were combined in the analyses. 19, 3 % (N = 71) had 1-7 years of teaching experience, 34 % (N = 126) and 47 % (N = 171) had over 12 years of teaching experience.

Study instrument

The instrument of the study was a survey. The principal component analysis was carried out for the three areas measuring teacher's competence in the first section of: a) *Professional qualities and values (PQV),* b) Professional knowledge and understanding

(PKU) and c) *Professional skill (PS)*, which derived from the professional standards established by the centre.

Study results and discussion

Females assess themselves more competent than males

Independent sample T-tests were run to determine whether there were differences in the competence sum scores between males and females. Because not all assumptions for parametric tests were met. A nonparametric Mann-Whitney's U-test was run to confirm the results. Females had significantly higher scores for *Attitudes towards cooperation with colleagues and parents* ($T(365) = -3.779$, $p < 0.001$)*, Competence in supporting students' higher order skills and career skills* ($T(365) = -1.982$, $p = 0.048$) and *Supporting students' individual needs* ($T(365) = -2,677$, $p = 0.008$). However, according to the nonparametric test the difference for the sum score *Competence in supporting students' higher order skills and career skills* was not significant, though close to significant ($p = .059$). Females had higher competence scores in other sum scores too, apart from the sum score *Feedback and assessment skills.*

In the domain i.e. PQV, teachers reported themselves as highly competent in enhancing the competence of students and colleagues, in PKU in supporting students' higher order skills and career skills and in PS, they reported having positive attitude towards own work. The training at the SCPTT has a particular goal to enhance the skills and performance of students, and especially improving students' 21st century skills, which cover higher order skills and career skills. Also giving feedback to teacher colleagues has been one of the ways to improve teaching competence in the SCPTT programmes. Teachers work with a colleague at school who is called a shadow teacher. The teacher attends classes, gives feedback and discusses with the shadow teacher strategies used in the class. Moreover, each new teacher identifies two to three aspects that he/she would like to improve such as contacting parents, asking for help and support, or use different ways to manage their classes with the help of the shadow teacher. The teachers' works will be kept in their own portfolio. However, despite that, teachers seem to feel competent in enhancing the skills of competence of colleagues, they had the lowest mean value in sum score *attitudes towards cooperation with colleagues and parents*. The reason for this might be that the sum score *Enhances the competence of students and colleagues* measures more the competence and the latter more reality of being able to do this in practice. It has been reported that teachers in Oman experience high workload at schools and this keeps teachers busy with their classes (Al-Ghattami & Al-Husseini, 2014). Because of this, teachers might not have enough time for communicating regularly with parents and colleagues.

The results are aligned with the previous findings in Omani context of Alkharusi (2011), Alkharusi, Aldhafri, Alnabhani (2011), and AlKalbani (2012) who found out that females outperform males in several areas of professional competencies. This contradicts with previous studies on self-assessment according to which males tend to overestimate their skills and females underestimate regardless of their performance level. However, this phenomenon was noticed to appear among students. One might

ask if the difference would have been even bigger if participants of both genders had evaluated their skills more realistically?

Summary and recommendations

This study investigated teachers' competences in the areas of teachers' professional qualities, knowledge and understanding, and professional skills.

The study gave several recommendations in terms of material design, and tackling gender differences issues and assessment. For material design, there should be more focus on tasks that can enhance collaboration between teachers, their colleagues and parents. It also recommended helping less experienced teachers to increase positive attitudes towards teaching. In terms of gender differences, male teachers need to be supported to show more cooperation with their colleagues and parents.

Study 3: Impact of In-Service Training on Teaching, Examined by Lesson Observation

Introduction

The aim of this study was to examine the impact of the newly organised professional development for teachers at the SCPTT in Oman by observing lessons of teachers who have recently participated in in-service training. To be able to evaluate the impact, a control group of teachers who have not attended Centre training was also observed correspondingly. 432 lessons from all over Oman were observed, 236 of whom were taught by teachers who participated in in-service training provided by the SCPTT. A control group of 196 teachers who did not participate in recent in-service training was observed. The results show that teachers with recent in-service training do much better in the classroom and females do better than males.

Research Questions and Methodology

This study examined the impact of the newly organised professional development for teachers at the SCPTT in Oman by observing lessons of teachers who have recently participated in in-service training compared with a group of teachers who have not attended the Centre's training.

Research questions

The research problem is formulated as two questions:

(1) What are the differences in the teaching between the two observed groups of teachers, those who participated in the in-service training and those who had not participated?

(2) How strongly are certain structural (e.g. regional) and individual (e.g. teacher gender, teacher experience) factors associated with the performance level in the two groups of teachers, the participants and the non-participants?

Data and participants

To examine the impact of in-service training provided in the SCPTT, 423 lessons in different schools covering nine regions (out of eleven) were observed. Of the observed lessons, 236 lessons were given by teachers who had participated in in-service training provided by the Centre. In order to examine the impact of in-service training programmes, a control group of teachers was observed. The control group of 196 teachers had not recently participated in in-service training. The first group is called 'participants' and the second 'non-participants'. In both groups the same observation tool was used.

Instrument

To meet the aims of this study, systematic observation was used, *the focus of which was in the teacher behaviour and the interaction between teacher and pupils*. In our study we focused on observing how teachers succeeded in 18 pedagogical areas. The foci of observation were based on professional standards of Omani teachers which are in the very core of in-service training programmes provided by the Specialised Centre. Thus, the observation form was constructed on Professional Standards including (1) professional skills, (2) professional qualities and values, and (3) professional knowledge and understanding.

Results and discussion

Based on lesson observations, results reveal that in-service training has a substantial impact on teacher behaviour in classroom. These findings presented in the tables below show that the teachers participated in in-service training are much better in all aspects measured. Results are presented according to the professional standards emphasized. The level of professional skills was measured by six items (Table 1). Teachers who had participated in in-service training seem to do far better than their colleagues who had not participated in respective training.

Table 1. Meeting Professional Standards: observed professional skills of participant and non-participant teachers (%)

Professional skills - Secure high levels of progress for all students

	Teacher	Outstanding	Good	Standard	Poor	Total (%)
Teacher is ready with resources, facilities and the classroom environment	Participants	70.3	18.6	8.9	2.1	100
	Non-participants		24.7	35.7	24.5	5.1	100
	All		54.2	26.4	16.0	3.5	100
Teacher shares learning objectives and success criteria	Participants	45.3	33.5	15.3	5.9	100
	Non-participants		16.3	34.2	27.6	21.9	100
	All		32.2	33.8	20.8	13.2	100
Students´ progress is monitored. Teacher intervenes with support when needed	Participants	46.6	39.4	12.3	1.7	100
	Non-participants		18.4	40.8	33.2	7.7	100

	Teacher	Outstanding	Good	Standard	Poor	Total (%)
	All	33.8	40.0	21.8	4.4	100
	Participants	39.8	35.6	18.2	6.4	100
Teacher relates the plenary to the learning objectives	Non-participants	9.7	33.7	33.2	23.5	100
	All	26.2	34.7	25.0	14.1	100
	Participants	43.2	42.8	12.7	1.3	100
Students receive systematic written or verbal feedback	Non-participants	19.9	40.3	31.6	8.2	100
	All	32.6	41.7	21.3	4.4	100
	Participants	24.6	52.5	17.8	5.1	100
The feedback provides understanding of the student's progress and how to improve	Non-participants	9.2	34.2	37.2	19.4	100
	All	17.6	44.2	26.6	11.6	100

Observed Professional qualities and values also showed a significant difference in the favour of participant teachers as shown in Table 2.

Table 2. Meeting Professional Standards: observed professional qualities and values of trained and non-trained teachers (%)

Professional qualities and values - Effectively support all students, work collaboratively with students

	Teacher	Outstanding	Good	Standard	Poor	Total (%)
Participation is encouraged by different methods	Participants	50.8	38.1	8.5	2.5	100
	Non-participants	18.4	38.8	32.1	10.7	100
	All	36.1	38.4	19.2	6.3	100
Teacher is able to get students enthusiastic about learning	Participants	52.4	32.2	11.2	4.3	100
	Non-participants	19.5	33.3	33.3	13.8	100
	All	37.4	32.7	21.3	8.6	100
All students are consistently engaged in learning activities	Participants	44.9	40.3	13.6	1.3	100
	Non-participants	18.5	34.9	33.3	13.3	100
	All	32.9	37.8	22.5	6.7	100
Teacher acts effectively with students who are not engaged in learning activities	Participants	31.5	48.1	16.6	3.8	100
	Non-participants	9.2	33.7	36.7	20.4	100
	All	21.3	41.5	25.8	11.4	100
Teacher and students work together with ease and harmony	Participants	58.1	33.1	8.1	0.8	100
	Non-participants	30.8	39.5	24.6	5.1	100
	All	45.7	36.	15.5	2.8	100

The observation of professional knowledge and understanding focused mainly on higher order thinking skills and 21st century skills. The difference between participants and non-participants can be seen especially clearly in teaching higher order skills and 21st century skills as Table 3 represents.

Table 3. Meeting Professional Standards: observed professional knowledge and understanding of participant and non-participant teachers (%)

Professional knowledge and understanding - Maintain up to date knowledge and understanding of specialist subject, teaching methodology and relevant research

	Teacher	Outstanding	Good	Standard	Poor	Total (%)
Demonstrations or examples related to everyday life is given to students	Participants	52.1	33.9	11.0	3.0	100
	Non-participants	20.9	38.8	30.1	10.2	100
	All	38.0	36.1	19.7	6.3	100
The students are engaged with differentiated learning activities	Participants	43.2	41.9	12.3	2.5	100
	Non-participants	9.2	36.2	39.3	15.3	100
	All	27.8	39.4	24.5	8.3	100
Higher order skills						
Learning activities engage the students in analysing.	Participants	39.4	42.4	16.9	1.3	100
	Non-participants	13.8	39.3	32.7	14.3	100
	All	27.8	41.0	24.1	7.2	100
Learning activities engage the students in evaluating	Participants	28.0	44.1	22.5	5.5	100
	Non-participants	10.7	29.6	38.8	20.9	100
	All	20.1	37.5	29.9	12.5	100
Learning activities engage the students in creating	Participants	21.6	41.1	29.2	8.1	100
	Non-participants	6.6	25.0	39.8	28.6	100
	All	14.8	33.8	34.0	17.4	100
21st century skills						
Learning activities engage the students in career skills	Participants	39.8	39.4	16.9	3.8	100
	Non-participants	10.2	31.6	38.8	19.4	100
	All	26.4	35.9	26.9	10.9	100
Learning activities engage the students in personal skills	Participants	30.5	42.4	20.3	6.8	100
	Non-participants	10.2	26.5	37.8	25.5	100
	All	21.3	35.2	28.2	15.3	100

The differences between participants and non-participants were statistically significant on each sum scale, and the scores of the professional standards were considerably higher for participant teachers as indicated by Cohen's d values (table 4).

Table 4. Differences in observed professional standard between male (participants and non-participants) and female (participants and on-participants)

Professional standard	Group	*M*	*SD*	t	df	p	d*

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Professional skills	Male	Participants	3.00	0.66	7.32	181	< 0.001	1.09
		Non-participants	2.29	0.64				
	Female	Participants	3.41	0.58	8.12	181	< 0.001	0.93
		Non-participants	2.81	0.67				
	All	Participants	3.23	0.64	10.04	430	<0.001	0.97
		Non-participants	2.58	0.70				
Professional qualities and values	Male	Participants	3.02	0.69	7.19	181	< 0.001	1.17
		Non-participants	2.29	0.69				
	Female	Participants	3.41	0.53	8.46	181	< 0.001	0.97
		Non-participants	2.81	0.73				
	All	Participants	3.31	0.64	9.93	430	< 0.001	0.97
		Non-participants	2.62	0.78				
Professional knowledge and understanding	Male	Participants	2.79	0.69	7.43	181	< 0.001	1.13
		Non-participants	2.08	0.59				
	Female	Participants	3.30	0.56	9.16	181	< 0.001	1.09
		Non-participants	2.59	0.75				
	All	Participants	3.11	0.66	10.78	430	< 0.001	1.06
		Non-participants	2.37	0.73				

Note: [*]Effect size Cohen's d: 0.2 small, 0.5 medium, 0.8 large (Cohen, 1988)

Results show the crucial role of gender in affecting the level of teachers' professional skills. Female teachers are observed to have reached much higher level of professional skills than their male colleagues in both studied groups.

Conclusion and Implications

Better performance of participant teachers compared to non-participants is the major result in this study, which is consistent with a number of previous studies by Borko (2004), Ostermeier e*t al.* (2010) and Cordingley *et al.* (2003). Participants seem to do better in catering for individual differences and using some aspects of formative assessment and teaching higher order thinking skills, which were recommended by previous studies on the Omani education (IEA 2012a, b, c; Al Shabibi and Silvennoinen 2018).

Both male and female teachers benefited from in-service training, but participation in in-service training has not been able to reduce the gender gap in skills. There is a large gender difference in favour of female teachers in meeting the professional standards. Al-Jaradi (2006) and Al-Hrmali (2015) agree that female teachers do better in teaching than male teachers. However, Alhosani (2016) and Çoğaltaya (2016) indicate that gender does not affect teaching performance. Culturally, one might assume that female teachers tend to regard the teaching profession as higher in status than male teachers. Consequently, they show more commitment to develop themselves and willingness to change their practices. However, this assumption needs further research.

To conclude, the fact that multiple observers carried out the observation could enhance the reliability of the findings according to LeCompte & Goet (1982) while Cohen *et al.*

(2011) suggest the inconsistency of the findings. This reservation is relevant when evaluating the limitations of this study.

Study 4: Principals' Perceptions on the Impact of Professional Development on Teachers' Practices in Oman

Introduction

The establishment of the new Specialised Centre for Professional Training of Teachers in 2014 has resulted in profound changes in the professional development programmes offered by the Ministry of Education in Oman. The aim of this study is to explore the impact of in-service training as perceived by school principals. The study used a quantitative approach to explore the improvement levels of the in-service-trained teachers in terms of teaching quality, commitment, involving parents, participating in school development, and affecting colleagues as perceived by the school principals (N = 251). The study also investigated the differences in the impact of training on teachers based on teacher's gender and years of teaching experience. The results show a positive change on teachers' performance in all areas of teaching practices. The degree of improvement varies by teachers' gender and the number of years of teaching experience.

It is widely acknowledged that teacher professional development (TPD) is likely to impact teacher quality and student learning (Antoniou and Kyriakides, 2013; Borg, 2011; Desimone, 2009; Desimone et al., 2002; Garet et al., 2001; Gibbs and Coffey, 2004; Harris and Sass, 2011; Highsmith, 1974; Ingvarson et al., 2005; Jacob, 2004). Hence, school teachers and principals have been increasingly involved in improving their teaching quality and professional skills through participating in various professional development programmes (Craft, 1996; Desimone et al., 2002). While teaching quality and teacher professional development are highly interdependent (Desimone, 2009), understanding of the relevance and impact of TPD would benefit from more intensive investigation on their relationship with each other.

Most of the studies on teacher professional development have focused mainly on recording teachers' satisfaction, beliefs, or commitment to the intervention rather than its impact or the process of its implementation (Desimone, 2009; Guskey, 2000). This is true also in the case of Oman (Al-Lamki, 2009; Alyahmadi & Al-Kiyumi, 2014). Moreover, the most commonly used methods for collecting data in teacher professional development studies are classroom observation and interviews with questionnaires to teachers (Day *et al.*, 2008; Desimone, 2009). These methods do not circumvent the inherent biases of believing in the positive impact of professional development which are found in discussions with teachers about their learning and behaviour (Desimone, 2009). However, this study broadens the perspective by providing a different approach in examining the impact of TPD on teachers' practices. The study provides empirical

evidence on the impact of teachers' in-service training from the standpoint of school principals. The main aim is to explore the impact of the programmes on teachers' practices, as perceived by their school principals, and to understand the possible differences in improvement displayed by teachers.

Research Questions and Methodology

This study sought to determine the impact of in-service training on teachers' practices, such as involving parents, participating in school development, commitment to the school's vision, and affecting other teachers' behaviours based on principals' perception. It also explores possible differences among teachers and changes in teachers' practices which we referred to as the concept of professional improvement.

Research questions

Given the critical role of professional development and its impact on teaching and learning, we interviewed the principals on the improvement they have perceived in professional practices of the teachers who have participated in in-service training. By this study we aim at answering two questions:

RQ1. Based on principals' perception, to what extent have the in-service-trained teachers improved in terms of teaching quality, commitment, involving parents, participating in school development, and affecting colleagues?

RQ2. Based on principals' perception, to what extent does the impact of in-service training vary in relation to teacher's gender and the number of years of teaching experience?

Data and participants

The target group of this study are teachers that have participated in in-service training programme at the SCPTT. Teachers participating in this study were randomly selected from the five training programmes (New teachers, Senior teachers ['Centre associates'], Arabic teachers, Science teachers, and Mathematics teachers). These 251 participating teachers represent all 11 regions (governorates) and all school types (Cycle One schools, Cycle Two schools, and Post-Basic schools) in Oman. The principals of these teachers were interviewed and asked to assess individually how much the participant teacher had changed his or her practices since starting the in-service training programme.

Instrument

A questionnaire form covering eight areas in teacher's work was developed in the study. The principals of the participants' schools were asked to describe and evaluate the change of the trained teachers' behaviour in those eight areas. Current education policy in Oman regards all these areas as crucial elements in efforts to update teachers' tasks and teaching as a profession as well as improving the quality of schooling. The eight items addressed levels of perceived change in teaching quality, involving parents, participating in school development, commitment to the school's vision, and affecting

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other colleague teachers' behaviours. Each item included four options (1: no change, 2: some change, 3: clear change, and 4: remarkable change). Answers to the questionnaire items reflected the principals' perception of the change on teachers' behaviours after the training period. Consequently, the results do not describe the level of competence of teachers, but rather the *perceived change,* and the association of the change with gender and experience.

Results and discussion

Professional improvement of teachers' practices

In general, the results reveal that the school principals perceived that participation in in-service training had improved the teaching practices of their teachers. The size of change, however, varied between areas of teacher's work. The interviewed principals assessed that teachers who had participated in in-service training had shown a clear improvement in the areas of cooperation with their colleagues, interest in self-development, commitment to improving their teaching quality, and affecting their colleagues' teaching behaviour. However, teachers had shown less improvement in areas of affecting other colleagues' behaviour related to the school community, involving parents, participation in school development, and commitment to the school vision.

The improvement is relatively low in affecting colleagues' school community behaviour and involving parents in school activities. An explanation for this weak change may be related to the traditional role that teachers have been expected to play in their schools (see Ministry of Education 2015). Responsibility for tasks such as influencing other colleagues' school community behaviour and involving parents has not explicitly assigned to rank-and-file teachers. Rather, these two tasks have usually been carried out by senior teachers and school administrators. Moreover, in addition to their teaching duties, Omani teachers are usually required to carry out certain administrative tasks (Ministry of Education, 2015). This may make it difficult for them to invest an appropriate amount of time and energy in the development of the school.

Improvement by gender

The independent sample t-tests computed to compare changes in teachers' performance based on their principals' perceptions revealed that there were significant differences in means between male and female teachers' improvement in the areas of teachers' commitment to improve their teaching quality and affecting colleagues' teaching behaviour. In both of these areas, female teachers were perceived to have shown a bigger improvement compared to their male counterparts.

The observed difference between males and females' in the size of improvement is significant. Although this study was not intended to explore the reasons behind these differences, the study supports the findings in previous studies (Chapman *et al*., 2014) that Omani female teachers are more satisfied with their teaching career than males. Thus, female teachers tend to be more committed to their profession and to developing themselves as teachers. Also, compared to their male colleagues, female teachers tend

to display higher levels of social communication which helps them to create stronger connections and relationships with each other (Merchant, 2012). Hence, female teachers are more likely than male teachers to share with their colleagues and to influence their behaviour.

Improvement by the number of years of teaching experience

When comparing differences among teachers with differing lengths of teaching experience, two major findings are revealed. First, the teachers with 8-12 years of teaching experience have improved the best, overall. Second, compared to their colleagues the teachers with only 1-2 years of teaching experience have benefitted the least from attending the training programmes.

The reason why teachers with only 1-2 years of teaching experience showed little improvement in their teaching practices can perhaps be attributed to the challenges and difficulties they face in adapting to and learning their new job (Wang *et al*., 2008). On the other hand, the reason why teachers with 8-12 years of experience tended to be more positively affected by the training can be explained by the fact that as they have become more experienced they have matured professionally, and this has enabled them to internalize the learning aspects of training and to reflect on their behaviour.

Conclusion and Implications

The results of the study indicate a positive change on teachers' performance in all of the aforementioned areas. The observed improvement varies according to gender and the number of years of teaching experience. The perception of the school principals was that female teachers displayed greater change in their commitment to improving teaching quality and affecting their colleagues' teaching behaviour than their male counterparts. In addition, the school principals perceived that the teachers with 8-12 years of teaching experience improved significantly more than other teachers, i.e. teachers with less than three years or more than 12 years of teaching experience.

This suggests that school principals and administrators could perhaps support subject teachers to create professional learning communities. This would help both male and female teachers to share and reflect to enhance their teaching skills and strategies and encourage improvements in others. Since the teachers with 1-2 years of teaching experience showed less improvement than other teachers, educational policy makers should consider launching special site-bounded training for new teachers in which they receive constant training, support, and guidance in their schools. Also, teachers with 8-12 years of teaching experience could be used as mentors and paired with teachers with less teaching experience. Furthermore, school principals and administrators should be aware of teachers' receptivity to change, and of the need to design special training programmes aimed at enhancing teachers' professionalism. In terms of theoretical implications, the study provides evidence on the relationship between teachers' change due to professional in-service training and the amount of teaching experience.

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