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Benchmarking Mentoring Practices: A Case Study in Turkey

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Throughout the world standards have been developed for teaching in particular key learning areas. These standards also present benchmarks that can assist to measure and compare results from one year to the next. There appears to be no benchmarks for mentoring. An instrument devised to measure mentees' perceptions of their mentoring in primary science was administered to 304 preservice teachers in Turkey. Results indicated that the majority of mentees perceived they received mentoring practices, however, 20% or more claimed they had not received 24 of the 34 practices outlined on the research-based survey. Establishing benchmarks for mentoring practices may assist educators to identify needs and developing programs that address these needs. This survey instrument can aid the identification of mentoring practices through the recipient's perspective for advancing mentoring, which may ultimately have an effect on improving teaching practices.

Keywords: Mentoring, Benchmarking, Preservice Teachers, Science Education, Mentors

INTRODUCTION

Over the last two decades, mentoring has emerged as an effective process for developing early-career teachers' practices (Feiman-Nemser, 2001; Harrison, Lawson, & Wortley, 2005; Hobson, Ashby, Malderez, & Tomlinson, 2009). Early-career teachers include preservice teachers and beginning teachers in the first years of practice. In an attempt to evaluate the effectiveness of mentoring for early-career teachers based on international related research, Hobson et al (2009) provide a benefit-cost analysis of mentoring from the perspectives of mentees, mentors, and key professionals within schools. From the perspective of early-career teachers, effective mentoring has reduced feelings of isolation, enhanced confidence and self-esteem, and improved professional development, self-reflection, and problem solving capacity (McIntyre & Hagger 1996, cited in Hobson et al., 2009). However, there are preservice teachers who feel inadequately supported by their mentors, particularly emotional and psychological support that may negate anxiety due to teaching situations (Hobson et al., 2009).

Mentoring has its share of problems and difficulties (Marable & Raimondi, 2007), particularly as mentoring is a shared dialogue. Löfström and Eisenschmidt (2009) identified mentor training, reflection and socialization as points to be improved in mentoring early-career teachers. Fletcher and Barrett (2004) evaluated the effectiveness of induction programs that involved surveying early-career teachers. The findings showed that early-career teachers perceived a sufficient help from their mentors in improving their instructional skills and teaching strategies. Mentors and mentees' roles can enhance the mentoring process. For example, Roehrig, Bohn, Turner, and Pressley (2008) explored mentoring

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State of the literature

- The quantitative study employs an empirically-based survey instrument to measure mentees' perceptions of their mentoring
- Considering that mentoring practices can be measured through mentees' perceptions as recipients of the mentoring process, which has been accomplished in Australia, Turkey and Vietnam

Contribution of this paper to the literature

- This study investigated mentees' perceptions of mentoring practices in primary science teaching.
- Establishing benchmarks for mentoring practices may assist educators to advance such practices. Survey instruments can aid the identification of mentoring practices through the recipient's perspective.
- Results in this study on mentees' perceptions can be used as benchmarks to determine the level of mentoring practices perceived by these preservice teachers.

effectiveness on the mentees' participation in the mentoring process. It was concluded that "more effective beginning teachers communicated more with mentors, more accurately self-reported use of effective teaching practices, and were more open to mentoring" (p. 684).

In Turkey, some studies have evaluated the effectiveness of mentoring from the perspectives of both preservice teachers and mentors. For example, Ekiz (2006) identified emerging issues in mentoring programs resulted mainly as either a lack of mentor-mentee communication or lack of mentor support. Okan and Yıldırım (2004) interviewed preservice teachers and their mentors to evaluate early school experiences. It was concluded that there was little evidence indicating effectiveness of the mentoring program. Isıkoglu, Ivrendi, and Sahin's (2007) qualitative study emphasized that preservice teacher's encountered destructive and inadequate supervision as well as constructive one. They also found that preservice teachers had difficulties proving their existence in the classroom and establishing professional relationships with their mentor teachers. A current debate in Turkey concerns the theory and practice connection for enacting effective mentoring practices. Indeed, the theoretical intentions of mentoring practices fall short of the actual practices implemented within schools (Ekiz, 2006; Okan & Yıldırım, 2004).

Subject-specific mentoring is another issue for developing effective mentoring programs in Turkey. Preservice teachers are required to complete some activities that were designed and offered centrally by the Higher Education Council for all teacher education programs (Asan, 2003; Ekiz, 2006). Although some modifications and adaptations could be done according to the subject areas, the variations in the school context are not considered (Okan & Yıldırım, 2004).

In their study, Gömleksiz, Mercin, Bulut, and Atan (2006) developed a questionnaire to explore preservice teachers' views about their mentors (supervising teachers) while in the school setting. The questionnaire was administered to 336 preservice teachers enrolled in "School Experience II" course. It was reported that these preservice teachers felt dissatisfied with their university supervising teachers' (i.e., faculty staff) approaching and evaluating the course. Kiraz and Yıldırım (2007) also administered a questionnaire consisting of open-ended questions to 690 preservice teachers to explore their perceptions about their supervising teachers' mentoring competencies. It was concluded that preservice teachers felt their mentoring was inadequate. The study also revealed that less experienced teachers exhibited more enthusiasm for mentoring, then it was suggested that experience should not be the only criterion for selecting teachers for mentoring practice. New mentors may be more enthusiastic; however their experience in pinpointing pedagogical practices and presenting constructive criticisms for mentees' reflection on practice may be more limited.

The Ministry of National Education in Turkey has implemented substantial reforms to facilitate a paradigm shift for elementary and secondary education. For example, in science and technology education constructivism and inquiry-based orientation have been included (Savran-Gencer & Cakiroglu, 2007). Under the scope of this reform, science and technology courses focus on developing students' scientific literacy and cater to students' individual differences. The Ministry of National Education has developed a set of teaching competencies and standards in the areas of science and technology in English.

Sağ (2008) conducted phenomenological research based on a group discussion and interviews to identify expectations of preservice teachers about their cooperating teachers, supervisors, and teaching practice in schools. The results revealed that preservice teachers' expectations of their cooperating teachers (mentors) focused on collegial relationships and guidance, clear communication, and acting as a role model and leader. Their expectations from their mentors also focused on providing guidance, establishing a good rapport, and mentoring about their teaching practices. The preservice teachers wanted to be perceived as teachers within a desirable teaching environment to facilitate their learning.

Higher Education Council regulates all higher education in Turkey. In particular, it is concerned with curriculum, personnel, relationships, facilities, management, and quality assurance of teacher education programs (YOK, 1999). The practicum courses in tertiary institutions in Turkey were restructured in 1998 by the Higher Education Council within the reform on teacher education. Further, faculty-school partnerships were empowered to provide more school experiences for preservice teachers. The model emphasizes more diversity in mentoring practices with stronger collaboration between faculties and schools including activity plans and defining roles and responsibilities of faculty staff (supervising), mentors (cooperative teachers) and preservice teachers (Asan, 2003; Ekiz, 2006; Savran-Gencer & Cakiroglu, 2007; YOK, 1998). For instance, mentors' roles include observation of preservice teachers' lessons, teaching methods and techniques in the classrooms (Ekiz, 2006).

There are some studies that have used surveys to measure mentors and mentees' perceptions in the literature. For example, Clinard and Ariav (1997) explored the perceptions of mentor teachers and the impact of mentoring. The results of this study showed large differences between American and Israel mentors in their perceptions of what they gained from the mentoring experience. In another study, Hudson (2007) proposed the use of a survey instrument to benchmark mentees' perceptions of their mentoring for developing their mathematics teaching and as a reference point for delivering professional development for mentors. Considering that mentoring practices can be measured through mentees' perceptions as recipients of the mentoring process, which has been accomplished in Australia (Hudson, 2006), Turkey (Hudson, Uşak, & Savran-Gencer, 2009) and Vietnam (Hudson, Nguyen, & Hudson, 2009), it appears as a sequential step to benchmark such practices for future developments. Indeed, benchmarking occurs in school systems (educational results attributed to school leavers and national tests) and universities (student feedback about teaching and assessment). The research question for this study was: How can mentees' perceptions be benchmarked for subject-specific mentoring?

Study context

Turkey has about 120 universities of which 58 have preservice teacher education programs. This study focuses on 304 final-year preservice teachers from 3 Turkish universities. Although these preservice teachers do not have school experiences in their first two years, their third involves 28 days in schools over two semesters. During this period, they observe their mentors' (teachers) professional behaviour in class, relationship with their students, classroom management techniques, behaviour management, teaching methods and strategies, and assessment practices. Preservice teachers within their third year at the university are expected to gain the following skills: improve questioning skills; acquire confidence in classroom control; understand how to assess students' works; design lesson plans; prepare exam questions, mark and analyse results; organise group work; and implement lessons.

In their fourth year they attend a school either 6 hours a day for 28 days or 3 hours a day for 56 days over two semesters. Both the mentor (cooperating teacher) and lecturer observe the final-year preservice teacher's teaching practices. They discuss how the preservice teacher can improve teaching practices. Apart from responsibilities delegated by the school administration and mentor, the university requires final years to teach a minimum of 10 lessons with planning, implementing, assessing and evaluating as key to their development. Mentors are also expected to assist the preservice teachers with knowledge and skills in these areas, including micro teaching skills such as group work, classroom management, content knowledge and pedagogical knowledge. This study specifically investigates benchmarking preservice teachers' perceptions of their mentoring in primary science teaching.

Theoretical Framework

This quantitative study employs an empirically-based survey instrument to measure mentees' perceptions of their mentoring. The survey is linked to a five-factor mentoring model (i.e., personal attributes, system requirements, pedagogical knowledge, modelling and feedback). Each factor has associated attributes and practices that were derived from the research literature about mentoring. Each attribute and practice had at least two empirical studies assigned to the survey item, with some items having far more empirical studies (e.g., mentors need to be supportive of mentees; Hudson, 2004, 2007). For instance, in the factor Feedback there are six practices assigned, that is, the mentor: articulated expectations for teaching, reviewed lesson plans, observed teaching for providing feedback, provided oral feedback, provided written feedback, and facilitated evaluation of teaching, which aligns with critical self reflection (e.g., see Briscoe & Peters, 1997; Feiman-Nemser, 2001; Ganser, 2002; Jarvis, McKeon, Coates, & Vause, 2001; Jonson, 2002; Mulholland, 1999; Schön, 1987).

The "Mentoring for Effective Primary Science Teaching" (MEPST, see Hudson, 2007) survey instrument arrived from a statistical analysis of 331 preservice teachers' responses on the five-factor model. The findings from this survey indicated acceptable

Cronbach alphas for each key factor, namely, Personal Attributes (mean scale score=2.86, SD=1.08), System Requirements (mean scale score=3.44, SD=.93), Pedagogical Knowledge (mean scale score=3.24, SD=1.01), Modelling (mean scale score=2.91, SD=1.07), and Feedback (mean scale score=2.86, SD=1.11) were .93, .76, .94, .95, and .92, respectively. The findings also showed that the majority of these 331 Australian preservice teachers perceived that their mentors did not provide mentoring on 27 of 34 items surveyed. However, further research is required to determine if this survey is transferable to other contexts, including other countries such as Turkey.

Data Collection and Analysis

The MEPST survey instrument was used in this study with 304 preservice teachers from Turkey at the conclusion of their year-long professional experience. Responses to these items were on a five-part Likert scale (i.e., strongly disagree=1, disagree=2, uncertain=3, agree=4, strongly agree=5). These data were subjected to confirmatory factor analysis (CFA; Hair, Anderson, Tatham, & Black, 1995), which defined a relationship between the variables (items) assigned to each factor. Cronbach alpha scores > .70 are considered acceptable for internal consistency (Klein, 1998). Data were analysed within each of the five factors (i.e., personal attributes, system requirements, pedagogical knowledge, modelling, and feedback) for developing primary science teaching, and descriptive statistics (i.e., percentages, means and standard deviations) were derived using a statistical analysis package SPSS.

RESULTS AND DISCUSSION

Cronbach alpha scores were considered acceptable for each factor (personal attributes=0.94, system requirements=0.77, pedagogical knowledge=0.91, modelling=0.85 and feedback=0.79, Table 1). All were greater than the required .70 (Kline, 1998) and all were statistically significant ($p<.001$). The mean scale scores ranged from 4.10 to 4.15 across the five factors indicated a majority of participants agreed or strongly agreed their mentors provided these mentoring practices. The following data presents further insights into the mentoring attributes and practices these preservice teachers perceived they had received during their school-based experiences.

Table 1. Mean scale scores and Cronbach alphas for the five factors (*n*=304)

Factor	Mean scale score*	Cronbach Alpha	*df*
Personal Attributes	4.12	.94	5
System Requirements	4.13	.77	2
Pedagogical Knowledge	4.12	.91	10
Modelling	4.10	.85	7
Feedback	4.15	.79	5

* All factors were statistically significant $p<.001$

Table 2. "Personal Attributes" for mentoring primary science teaching (*n*=304)

Mentoring Practices	%*	*M*	*SD*
Listened attentively	87	4.29	0.68
Instilled confidence	79	4.17	0.77
Supportive	73	3.98	1.18
Assisted in reflecting	73	4.26	1.01
Comfortable in talking	72	4.13	0.96
Instilled positive attitudes	71	3.92	0.99

* % = Percentage of mentees who either "agreed" or "strongly agreed" their mentor provided that specific mentoring practice.

Table 3. "System Requirements" for mentoring primary science teaching (*n*=304)

Mentoring Practices	%*	*M*	*SD*
Discussed aims	87	4.37	0.88
Discussed policies	74	4.16	1.14
Outlined curriculum	56	3.87	1.15

* % = Percentage of mentees who either "agreed" or "strongly agreed" their mentor provided that specific mentoring practice.

Between 71 to 87% of mentees perceived that their mentors exhibited personal attributes for mentoring. Nevertheless, mentees claimed that more than 20% of mentors did not instil confidence or positive attitudes or assist in reflection on practice. More than 25% of mentees did not agree or strongly agree that their mentors were supportive or comfortable in talking about teaching primary science (Table 2). A key part of mentoring is supporting the mentee, especially assisting them to reflect on their teaching (e.g., Schön, 1987). Yet, it appears that mentors are either not explicit enough for mentees to recognise these mentoring practices or they are not involved in these practices. Either way, significant numbers of mentors may not have personal attributes education about mentoring effectively. Teachers can be effective practitioners however some may not be suited to mentoring, particularly as mentoring requires communication with adults instead of primary students. Berliner (1986, p. 7) also states, "experienced and expert practitioners very often lack the ability to articulate the basis for their expertise and skill."

In system requirements, the majority of mentees claimed that their mentors discussed aims and policies for teaching science; although only 56% recorded they had the prescribed science curriculum outlined to them (Table 3). These percentages are more than double than the study conducted in Australia for primary science mentoring but appeared more comparable to mentoring in primary mathematics in Australia (Hudson, 2007). Science is not be given high priority by primary teachers in Australia (Goodrum, Hackling, & Rennie, 2001) while

Table 4. "Pedagogical Knowledge" for mentoring primary science teaching (*n*=304)

Mentoring Practices	%	*M*	*SD*
Provided viewpoints	88	4.34	0.69
Discussed problem solving	83	4.42	0.77
Guided preparation	82	4.09	1.07
Discussed assessment	81	4.27	0.77
Assisted with teaching strategies	79	4.35	0.81
Discussed content knowledge	77	3.94	1.13
Assisted with classroom management	76	4.07	0.74
Discussed questioning techniques	75	3.84	0.97
Discussed implementation	73	4.05	0.92
Assisted in planning	66	3.97	0.98
Assisted with timetabling	65	3.98	0.97

* %=Percentage of mentees who either "agreed" or "strongly agreed" their mentor provided that specific mentoring practice.

Table 5. "Modelling" primary science teaching (*n*=304)

Mentoring Practices	%	*M*	*SD*
Demonstrated hands-on activities	86	4.21	0.84
Displayed enthusiasm for teaching	85	4.27	0.74
Modelled a well-designed lesson	80	4.33	0.79
Modelled effective teaching	79	4.10	0.72
Modelled teaching	76	4.10	0.72
Modelled rapport with students	75	4.00	0.89
Used syllabus language	73	4.08	0.79
Modelled classroom management	55	3.77	1.10

* %=Percentage of mentees who either "agreed" or "strongly agreed" their mentor provided that specific mentoring practice.

Table 6. Providing "Feedback" on primary science teaching (*n*=304)

Mentoring Practices	%	*M*	*SD*
Provided evaluation on teaching	86	4.17	0.84
Reviewed lesson plans	78	4.19	0.81
Provided oral feedback	77	4.19	0.79
Provided written feedback	77	4.11	0.94
Articulated expectations	74	4.14	1.05
Observed teaching for feedback	74	4.14	0.93

other countries such as Turkey may have greater emphasis on studying science in the primary school.

Practices aligned with mentoring pedagogical knowledge were agreed upon by most mentees, yet despite the majority indicating that their mentors had demonstrated such practices (Table 4), there were gaps in the mentoring perceived by many mentees. For example, about 75% of these mentees claimed they had discussed questioning techniques or implementation of a science lesson, yet less than 70% had assisted in planning or timetabling of a science lesson (Table 4). Pedagogical knowledge makes "understanding of science usable in the classroom" (Mulholland, 1999, p. 26), and consequently, many mentees who are in their beginning stages of development require practical directions for enhancing their teaching. Mentors need to be explicit in assisting their mentees with clear advice about successful teaching strategies and age appropriate content knowledge for teaching science. Pedagogical knowledge around planning (Jarvis et al., 2001), timetabling or scheduling lessons (Williams, 1993), implementation of the lesson (Briscoe & Peters, 1997) and questioning skills (Fleer & Hardy, 2007) for teaching science was not agreed upon by a quarter or more of these preservice teachers.

A similar picture occurs with mentees' claims about mentors' modelling of teaching practices. That is, significant numbers of mentees perceived they were uncertain or did not observe their mentors model teaching or classroom management (Table 5). This is of concern, as mentees can learn considerably by observing mentors in action (Carlson & Gooden, 1999), particularly as managing student behaviour for early-career teachers can lead to stress with more than 25% leaving the profession within the first five years (Crosswell, 2009; Lewis, Romi, Qui, & Katz, 2005; Putman, 2009). Indeed, modelling classroom management does not occur in the university setting, as there are no primary students within such settings, hence, there are lost opportunities for developing preservice teachers' practices for significant numbers of mentees.

Although mentees claimed that their mentors provided evaluation about their teaching, more than 20% of mentees could not agree or strongly agree that their mentors provided feedback on five of the six items (Table 6). Oral and written feedback provides a way for mentees to reflect on their practices with consideration of expert opinion (Feiman-Nemser, 2001; Ganser, 2002). Articulating clear expectations needs to be up front so mentees can reflect on planning and make suggested amendments (Jonson, 2002); yet less than three quarters of these mentees perceived their mentors had presented these expectations.

More than 25% of mentees perceived that their mentors did not support them or instill positive attitudes for teaching. Reflection on practice is considered to be pivotal to professional growth in teaching (Schön, 1987), however less than three quarters of these mentors appeared to discuss with mentees their reflection on practice (Table 2). This percentage may also coincide with articulating expectations about teaching, which can help to facilitate dialogue for reflecting on practices (Jonson, 2002; Table 6). These mentors seemed to provide evaluation of teaching but may not have encouraged the mentee to present viewpoints on teaching practices in the form of critical self reflection.

Forty-four percent of mentees indicated that their mentors did not assist with planning even though they would help with classroom preparation (Table 4). Planning is a crucial point towards implementing teaching and learning activities in science (Jarvis et al., 2001). Mentees who receive no or minimal guidance on planning and implementing plans may not reach higher levels of teaching practices at this formative stage of development. Indeed, 44% of mentors also were seen not to outline curriculum documents which are required for planning lessons (Table 3). Mentors must engage with their mentees at each stage of the teaching process; that is, planning, implementation, assessment, and evaluation. Although it appears that mentors were willing to discuss viewpoints and problem solving for teaching, other processes such as planning and evaluation were not considered as much.

There were some incongruous results in this study. Mentees claimed that mentors demonstrated hands-on activities and modelled teaching practices, yet it was not perceived they had modelled classroom management to the same degree (Table 5). Classroom management would be embedded in the hands-on activities, though this response indicated that a small percentage of mentors may provide hands-on activities but not have effective classroom management techniques. Another incongruous result was with the factor Feedback, which showed that 74% observed teaching to provide feedback yet 3% provided oral and written feedback without observation. This was also the case in a previous study (Hudson, 2007). In a small percentage of cases, mentees may not be aware that the mentor is observing their practices or mentors may have provided feedback without observation. It may be that three percent of mentees did not accurately record their responses on the survey. Considering assessment and teaching are inextricably linked, nearly 20% of mentees perceived their mentors did not discuss assessment.

CONCLUSION

This study investigated mentees' perceptions of mentoring practices in primary science teaching. Internationally, many universities now conduct

evaluations of lecturing practices, which involves university students' perceptions of their teaching and learning. Evaluation results are used as benchmarks to measure students' perceptions from one year to the next (e.g., Queensland University of Technology). In a similar way, results in this study on mentees' perceptions can be used as benchmarks to determine the level of mentoring practices perceived by these preservice teachers. Mentees are recipients of mentors' practices (Feiman-Nemser, 2001); hence they are well placed to comment upon their mentors. The mentees' perceptions are through observations and experiences and, even though interpreting these observations and experiences may vary from one mentee to the next, it presents a way to gain multiple perspectives in the form of qualitative data about mentors' practices.

Studies (Ekiz, 2006; Isıkoglu et al., 2007; Okan & Yıldırım, 2004) that have investigated mentoring practices and experiences have suggested a lack of mentoring or poor mentoring practices. The results in this current study showed that a majority of mentees perceived their mentors provided mentoring practices on all items, however, each item showed percentage differences that may be investigated further. Nevertheless, the percentages provide a benchmark to understand how mentoring may occur in school-based experiences. Although this study was about mentees' perceptions, either the mentee has not received the mentoring practices or these practices were not transparent or explicit enough for mentees to recognise. Either way, results in this study can be used as a benchmark on what mentees perceive they receive in their mentoring. Institutions can target areas for professional development and then use the survey instrument to determine if mentoring practices are becoming more purposeful and explicit through the eyes of the mentees.

Establishing benchmarks for mentoring practices may assist educators to advance such practices. Survey instruments can aid the identification of mentoring practices through the recipient's perspective. For example, acceptable Cronbach scores indicated internal consistency for the survey; however when evidence shows that 20% or more mentees indicated they had not received 24 of the 34 practices then institutions need to direct their energy towards improving specific mentoring practices. Indeed, clearer identification of effective practices may be compiled as exemplars for all mentors. This type of work requires strong collaboration between institutions and participating schools.

The commonalities outlined in mentees' reports on their mentors' practices can identify areas where professional development can advance mentoring in schools. For example, this study showed that mentees' claimed mentors guided them in the aims (87%), policies (74%) and curriculum (56%) for teaching primary science; hence if an evaluation in a subsequent year shows lower percentages then the variability in mentoring practices can be pinpointed towards devising ways for improvement. Conversely, mentoring practices that are perceived to increase can allow researchers to investigate specific areas for understanding effective mentoring. Indeed, qualitative studies into how mentoring occurs in each of these mentoring practices can provide further evidence for delivering effective mentoring strategies.

More research is needed to determine how specific mentoring practices translate into teaching practices. Research also needs to investigate mentors' reports on their own mentoring practices (e.g., see Hudson, 2010). Mentees' perspectives can also assist towards understanding mentoring practices in specific contexts (e.g., other countries and other disciplines such as mathematics or English as a foreign language). Indeed, the five-factor mentoring model may be used across and within cultures and disciplines to benchmark mentor's practices (e.g., Hudson, Nguyen, & Hudson, 2009); however more research is required to understand mentees' perceptions through rich qualitative studies. Effective mentoring needs to be at the forefront of assisting preservice teacher development, particularly as preservice teachers learn about teaching through real-world experiences. Benchmarking mentoring practices can assist tertiary institutions to identify areas of success and areas that require further support to enhance such practices.

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