2nd International Conference on Higher Education Advances, HEAd´16, 21-23 June 2016, València, Spain

Looking Through the Eyes of Mentors and Novice Teachers: Perceptions Regarding Mentoring Experiences

Gabriella Shwartz[a]*, Yehudit Judy Dori[a]

[a]*Technion-Israel Institute of Technology, Faculty of Education in Technology and Science, Technion City, Haifa Israel*

Abstract

Over the last decade, we have witnessed a declining trend in the teaching work force. The shortage of certified, STEM teachers is of concern throughout the world. Addressing the shortage of STEM teachers, STEM initiatives in Israel have emerged in order to ensure that excellent STEM teachers will provide excellence in STEM education. Our research focuses on a mentoring program that aims to: (1) facilitate the process of integrating new teachers, and (2) ensure high quality teaching to enhance students' achievements. The finding revealed that a teacher's mentoring job is muli-faceted; mentoring novice teachers addresses affective, discipline-based aspects of both pedagogical and content knowledge, and technical aspects on a daily basis. The findings can promote the improvement of mentoring programs that aim to further improve the integration and retention of novice STEM teachers within the educational school system.

1. Introduction

At present, the science, technology, engineering and mathematics (STEM) disciplines are the drivers of technological advancement and innovation, and they can secure a robust economic future (Watt, Richardson, & Pietsch, 2007). Therefore, countries around the world have stepped up efforts to strengthen science education (Huang, 2015). As part of these efforts, policymakers and educators have increasingly prioritized improving the

––––––––

* Corresponding author. Tel.: +972 4-824-0111
E-mail address: gabby.shwartz@gmail.com

quality of the teacher work force (Goldhaber, Krieg, Theobald, & Brown, 2014). Unfortunately, over the last decade, we have witnessed a declining trend in the teaching work force. The shortage of certified, STEM teachers is of concern throughout the world (Fantilli, & McDougall, 2009). In our country, the number of science and technology teachers has decreased by 5.3% between the years 1998-2010.

Once a teacher is hired and begins the process of integrating into the school system to teach STEM, there is over 50% likelihood that she or he will leave teaching within their first five years (Hare & Heap, 2001). This evidence is troubling, because research has indicated that well-prepared and capable teachers have the largest impact on student achievement (Wilson, Flodent, & FerriniMundy, 2001).

Addressing the shortage of STEM teachers, STEM initiatives in Israel have emerged in order to ensure that excellent STEM teachers will provide excellence in STEM education. Our research focuses on a mentoring program that aims to: (1) facilitate the process of integrating new teachers, and (2) ensure high quality teaching to enhance the students' achievements. Previous studies have demonstrated that effective mentoring programs can help teachers gain more confidence in their professional capability, translate educational theory into practice more effectively and improve communication skills (Shapira-Lishchinsky, 2009). Given the need for new teachers to successfully meet challenges, our research aims to describe and characterize the perceptions of novice teachers and their mentors while both groups participate in the mentoring processes.

2. Design

2.1. Research Context

In the school system of our country, first year novice teachers are obliged to participate in an induction program. The main component of the induction program is the mentoring program, in which trained mentors help novice teachers plan lessons; assist them in gathering information about best practices and instruction pedagogies; observe the novice teachers' classes; and provide feedback and reflection. The present study examines the perceptions of mentors and novice teachers regarding their experiences participating in the mentoring program.

2.2. Research Participants

The study participants were 12 science and technology teachers, six of whom were mentors and six of whom were novice teachers. The mentors were experienced high-school STEM teachers responsible for preparing students for their matriculation exams. All the novice teachers were in their first year of teaching, teaching high-school STEM subjects. The participants were selected based on the diversity of their academic background, educational discipline, and their willingness to be interviewed and observed.

2.3. Research Tools and Methodology

The research goal was interpretive in nature (Strauss & Corbin, 1990); as such, semi-structured interviews, observations of meetings between mentors and novice teachers, and reflective writings of mentors and novice teachers, were collected. In the interviews, we used a self-designed guided-interview based on Patton (1990). The interview protocol included a pre-prepared set of questions for documenting teachers' perceptions. Selected guided-interview questions included the following: (1) what are your expectations from the mentor / novice teacher? (2) did you encounter challenges during the mentoring process? If so, describe how you coped with these challenges; (3) in which aspects did you feel the mentoring program contributed and/or helped your teaching abilities?

For data analysis, we employed the process of open coding, axial coding, and selective coding (Flick, 2006). Our intention was to search for integrated themes and relationships among mentors and novice teachers' understandings and experiences as part of the mentoring process.

Open coding was performed by two experts, both of whom individually coded the interviews, observations, and reflection documents. The experts looked for, and identified emergent themes throughout the collected data. For axial coding, both experts shared and revised their respectively found themes and discussed the possible

interpretations of the data. Using this process, they reached a consensus of three frequently recurring themes which can be seen in Figure 1, below.

3. Findings

We identified three main dimensions of the perceptions towards the mentoring program and categorized them as follows: affective, professional and technical aspects. Each dimension includes different aspects as shown in Figure 1. All three dimensions include mentors' and novice teachers' perceptions that are related to the mentoring processes as they experienced it.
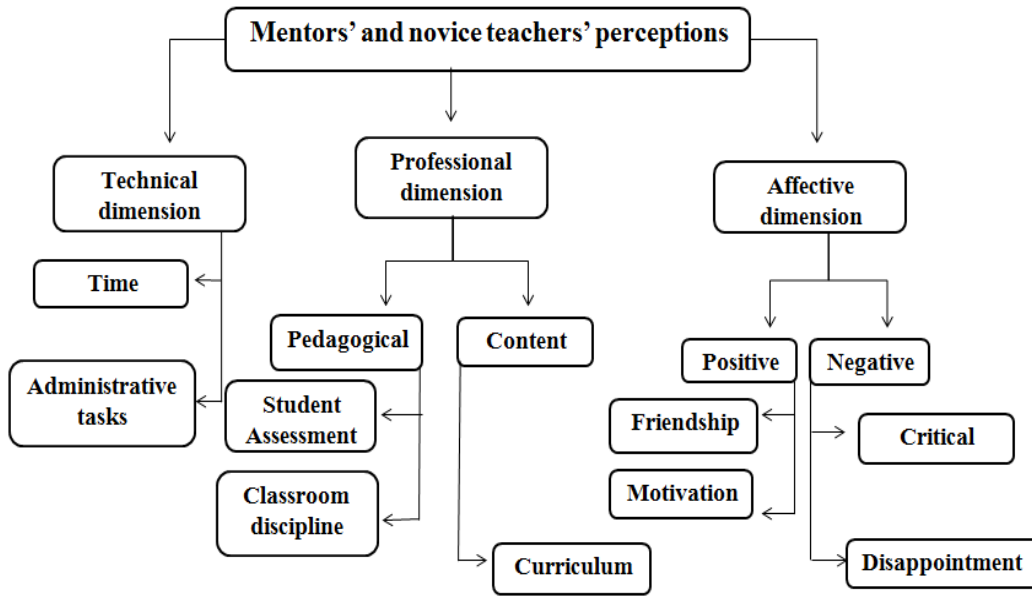

Fig. 1. Mentors' and novice teachers' perceptions regarding the mentoring process

3.1. First dimension: Affective

During interviews, observations, and reflection analysis, affective aspects emerged frequently, both from the mentors and the novice teachers.

A variety of affective responses emerged, some positive, such as friendship and motivation; and some negative, such as disappointment and criticism.

When teacher S was asked about her expectations from the novice teacher she was working with, she answered: "I had a lot of expectations of him, but unfortunately I was really disappointed by his performance." This disappointment was also expressed by teacher B at an interview wherein he explained that he was disappointed by the novice teacher he previously mentored: "This time, I did not encounter as many challenges, because I learned from the great disappointment I felt after my previous experience." He also emphasized that "it was important to clarify to [my novice teacher] when we started the process, that I do not mean to be critical, or judgemental in any way."

Many mentors and novice teachers expressed positive feelings towards the mentoring process. Novice teacher T wrote in her reflection, "[my mentor] is so supportive and she always knows to say the right thing to encourage me. During the observation of [a different mentor S] and [novice teacher A] it was obvious that the mentor was very

upset when trying to explain to his novice teacher how important it is for him to work according to the curriculum and assess the students in the correct way.

Mentors emphasized the importance that their novice teachers be self-motivated to continuously learn and be receptive to feedback. Teacher G said in his interview that "the most important thing for me is that the novice teacher will be motivated to make progress in the field of teaching and promote student achievement."

3.2. Second dimension: Professional

The mentors and novice teachers emphasized the importance of the discipline-based aspects of both pedagogical and content knowledge. The mentors explained that their main emphasis was making clear that assessment and curriculum-understanding were very important.

Additionally, the mentors and novice teachers said that dealing with student disciplinary issues is also an important matter to which they devoted much time. Teacher *A* writes in his reflection that "earlier this year, the meetings with my mentor focused primarily on content and the subjects that I should teach as part of the curriculum. We sat together on the syllabus and prepared a plan and a timetable for teaching different subjects." Regarding disciplinary measures, Teacher *D* described having difficulties: "*S* [my mentor] and I taught in parallel classes, and on one occasion she entered my classroom and asked everyone to be quiet. I did not respond positively to her actions, as it questioned my authority as a teacher." From teacher *D*'s statement, we see that while he admits to difficulties with classroom-management at the same time, he was disappointed with the way his mentor acted. It is noteworthy that the pedagogical and affective aspects overlap here – there are affective aspects to maintaining an orderly classroom which is conducive to learning and successful pedagogical implementation.

3.3. Third dimension: Technical

This aspect referred to time constraints related to administrative and bureaucratic tasks (as opposed to pedagogical tasks) the mentor and novice teacher often had to deal with. For example, during the observations before parents' day, Teacher M guided Teacher T through performing administrative tasks, such as entering student grades into the computerized system.

To sum up, the comments and reflections from the teachers in the mentoring program revealed that a teacher's job is muli-faceted; mentoring teachers addresses affective, professional, and technical aspects on a daily basis.

3.4. Discussion and Contribution to the Teaching and Learning of Science

Mentoring is a key factor for professional success in science education (Fantilli, & McDougall, 2009). Successful mentorship is vital to career success and satisfaction for both mentors and novice teachers (Straus, Johnson, Marquez, & Feldman, 2013). Our study provides guidance for mentors and novice teachers on how to create a successful mentoring relationship based on their perceptions. The results of this study revealed that perceptions of mentoring are affected by three main dimensions: affective, professional and technical aspects. These findings strengthen the claims that a successful mentoring is characterized by key components such as respect, trust and role modelling-all affective aspect (Eller, Lev, & Feurer, 2014). Additionally, it is well documented in the literature that effective mentoring creates supportive environment that would: (1) enable the novice teachers to develop self confidence in teaching science, (2) further their understanding of science curriculum and school policies, and (3) help with developing their pedagogical knowledge and improve their science teaching (Parker, 2004; Schneider, 2008).

The study described has theoretical and practical contributions to the development and growth of STEM educators in Israel. The theoretical contribution of the study is in characterizing the perceptions of mentors and novice teachers who chose to participate in the mentoring program in order to become better STEM educators. The practical contributions of this study is in the design and/or improvement of mentoring programs that aim to further improve the integration and retention of novice STEM teachers within the Israeli school system.

References

Eller, L. S., Lev, E. L., & Feurer, A. (2014). Key components of an effective mentoring relationship: A qualitative study. Nurse education today, 34(5), 815-820.

Fantilli, R. D., & McDougall, D. E. (2009). A study of novice teachers: Challenges and supports in the first years. Teaching and teacher education,25(6), 814-825.

Flick, U. (2006). An introduction of qualitative research. London: Sage.

Goldhaber, D., Krieg, J., Theobald, R., & Brown, N. (2014). The STEM and Special Education Teacher Pipelines: Why Don't We See Better Alignment Between Supply and Demand?. Phi Delta Kappan (in press, available as CEDR working paper 2014-3).

Hare, D., Heap, J., & Raack, L. (2001). Teacher Recruitment and Retention Strategies in the Midwest: Where are They Do They Work?. North Central Regional Educational Laboratory.

Huang, J. (2015). The Forecast of Demand and Shortage of China 2015-2025 Primary School Science Teachers. *Cross-Cultural Communication*, *11*(3).

Shapira-Lishchinsky, Orly. "Israeli teachers' perceptions of mentoring effectiveness." *International Journal of Educational Management* 23, no. 5 (2009): 390-403.

Schneider, R. (2008). Mentoring new mentors: Learning to mentor preservice science teachers. *Journal of Science Teacher Education*, *19*(2), 113-116.

Strauss, A. L., & Corbin, J. M. (1990). *Basics of qualitative research* (Vol. 15). Newbury Park, CA: Sage.

Straus, S. E., Johnson, M. O., Marquez, C., & Feldman, M. D. (2013). Characteristics of successful and failed mentoring relationships: a qualitative study across two academic health centers. *Academic medicine: journal of the Association of American Medical Colleges*, *88*(1), 82.

Patton, M. Q. (1990). Qualitative evaluation and research methods. Newbury Park, CA: Sage.

Parker, J. (2004). The synthesis of subject and pedagogy for effective learning and teaching in primary science education. *British Educational Research Journal*, *30*(6), 819-839.

Watt, H. M., Richardson, P. W., & Pietsch, J. (2007). Choosing to teach in the "STEM" disciplines: Characteristics and motivations of science, ICT, and mathematics teachers. *Mathematics: Essential research, essential practice*, *2*, 795-804.

Wilson, S. M., Floden, R., & Ferrini-Mundy, J. (2001). Teacher preparation research: Current knowledge, gaps. In *and Recommendations*. Center for the Study of Teaching and Policy Seattle, WA.