TEACHER AS A RESEARCHER: TO BE OR NOT TO BE?

Mario Mäeots

University of Tartu, Faculty of Social Sciences and Education, Institute of Education, Centre for Educational Technology (ESTONIA)

Abstract

This paper presents some reflections on the concept of teacher as a researcher. It describes the results of two studies. In the first study, 44 Estonian pre-school and basic school teachers were surveyed in order to identify their understanding about the concept of the teacher as a researcher. They were asked to describe the role of the teacher as a researcher, their motivation to adopt research activities in their work, and the main obstacles preventing a teacher from acting as a researcher. The results show that although doing research is important according to teachers, they fail to practice it themselves due to lack of knowledge and time. In the second study, 49 Estonian teachers were asked to describe the phases that are necessary for conducting research. Based on the results three types of teacher researchers emerged: Inquirers, Analyzers, and Seekers. Overall, the teachers believe that teacher research activities help improve their teaching, but need support in applying research related activities.

Keywords: teacher research, teacher research skills, teacher professional development, teacher training.

1 INTRODUCTION

The expectations society or policymakers have of teachers’ is always changing. According to international policy documents (e.g., see the European Commission report Rethinking Education: Investing in skills for better socio-economic outcomes, http://eose.org/wp-content/uploads/2014/03/communication_rethinking-education_2012.pdf) or in national educational policy documents (e.g., see Estonian Occupational Qualifications for Teachers, http://www.kutsekoda.ee/en/kutsesysteem/tutvustus/kutsestandardid_eng) teachers should nowadays be innovative, digitally competent and learner-oriented. In order to meet all of these requirements teachers need to undertake continuous professional development with constant reflection on their work. This involves analyzing their teaching with valid (i.e. research-based) methods – in other words, teachers should act like researchers.

1.1 Teacher research

Teachers are practitioners whose main task is to apply meaningful teaching methods to support student learning. Most of these teaching methods are usually learnt during pre-service teacher training courses or after attending in-service courses. Over time these practical experiences accumulate and form certain routines in a teacher’ practice [1]. Routines are on the one hand good (e.g., keeping discipline in class) but not for applying flexible and innovative teaching methods (e.g., flipped classroom, inquiry-based learning, self-regulated learning). Professional development can support the development of these innovative methods.

One component of teacher professional development is teacher research. Drawing from the literature teacher research is seen as a reflective practice aimed to support professional development focusing on individual development or contributing to the development of public knowledge [2]. Admiraaal et al. state that there are three main goals for teacher research: (1) improving teaching practice, (2) increasing professionalism, and (3) extending the knowledge base [3].

Other studies have shown that teacher research has a positive impact on developing and deepening teaching expertise [4, 5]. For example, Martell [6] studied teachers' who attended a teacher research professional development course where they learned topics like “introduction to teacher research” or “research methods”. During the course, teachers conducted several inquiry-related activities or were asked to make reflective journal entries. Data was collected during and after the course (e.g., using questionnaires, interviews or making observations). A key result of this study is that teacher reflection practices showed positive improvement. Moreover, these improved reflection practices led to more effective learning and teaching. Still, teachers emphasized that teacher research is difficult without professional help [7]. Thus, teachers need support in applying research related activities. There are
plenty of options to consider, starting with collaboration with research institutions, universities, attending thematic in-service courses or conferences etc.

1.2 Teacher research methods

Methods used in teacher research are mostly qualitative rather than quantitative, and rarely apply a pre-test—intervention—post-test with control group research design [3]. Teachers have quite limited knowledge, low level of research-related skills or they are without previous research experience [1]. Research indicates that teachers describe their research skills using the past tense [6], meaning that they have some knowledge or skills but are no longer confident any more (e.g., it is really hard to state a problem or formulate a research question [3]). Therefore, there is nothing extraordinary that teachers declare teacher research is ineffective use of time and resources or they do not perceive any value for their classroom practices [1].

Experiences with teachers during in-service courses in Estonia and the results of the current study (see following sections) also confirm that teachers have difficulties with research-related activities. All this gives an impetus to re-design in-service course frameworks so that it has elements to support teacher research.

1.2.1 Teacher training framework

The basis of the framework is established on the practical experiences that are complemented by the inquiry-based framework. The general aim was to support teacher research methods (see Figure 1) using five inquiry phases – orientation, conceptualization, investigation, conclusion, discussion developed by Pedaste et al [8].

<table>
<thead>
<tr>
<th>Tool</th>
<th>Inquiry phase</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tools for brainstorming and questioning (e.g., Answergarden, Tricider).</td>
<td>Orientation Conceptualisation</td>
<td>Topic: Human body RQ: How planned activities support the development of digital competencies?</td>
</tr>
<tr>
<td>Tools for planning content creation and creating content (e.g., Google docs, Padlet).</td>
<td>Planning</td>
<td>Activities supporting the development of digital competencies.</td>
</tr>
<tr>
<td>Tools for data collection (e.g., Google form).</td>
<td>Investigation Data analysis</td>
<td>Feedback questionnaire, preliminary conclusions.</td>
</tr>
<tr>
<td>Tools for presentation (e.g., Prezi).</td>
<td>Discussion</td>
<td>Comprehensive action supporting integration between subjects.</td>
</tr>
<tr>
<td>Tool of your choice.</td>
<td>Reflection</td>
<td>Reflecting on the experience.</td>
</tr>
</tbody>
</table>

Figure 1. Teacher training framework with examples.

The framework was first used for developing the specific course on supporting teachers' digital literacy and the meaningful use of digital technology. Throughout the course it was used by the teachers as a systematic structure for solving assignments provided by the in-service course instructor. Teachers were divided into the groups of four and asked to develop digital learning materials that support student learning. During the course the teachers were introduced to different digital tools for use during different inquiry phases. The first step was the orientation and conceptualisation phase, which aimed to identify a topic about which learning material would be developed. To support digital literacy in this phase, the teachers were introduced to digital tools for brainstorming (e.g. Answergarden, https://answergarden.ch and Tricider, https://www.tricider.com). The outcome of this phase was a selected topic and a research question (e.g. how effective is using digital technology in teaching?). Next was the planning phase, where teachers had to plan learning activities (i.e. describe the lesson) for their students. This phase was supported by different collaborative software for creating text-based content (e.g., Google docs or interactive whiteboard Padlet, https://padlet.com). Also, a preliminary research plan for answering their research questions was made.

After planning, teachers moved into the investigation phase where they learned to create online questionnaires (e.g., mQlickers, http://www.mqlicker.com or Google from) for data collection. They
were asked to create one feedback questionnaire to be used with the other course participants. The content of the questionnaire had to be about the planned learning activity. In the discussion phase, which aimed to share and receive feedback, presentation software was introduced (e.g., Emaze, http://emaze.com or Prezi, https://prezi.com). Here it was organized so that one group of teachers made presentations while others gave feedback using the questionnaire that was created in the previous phase. At the end of presentations each group had data based on what they did to analyze and modify their learning activity. The final phase was a group reflection on the whole process that was completed during the in-service course.

1.3 Problem and research questions

Expectations for teachers often create many challenges that place teachers into uncomfortable situations that might have an influence on their teaching. It is clear that teacher research is one of these topics that is still challenging for teachers. Why is it so? Are we still struggling with the same issues discussed in the literature? The current paper specifically addresses two research questions:

- How do teachers understand the concept of teacher research?
- What are the main obstacles for conducting teacher research?

2 METHOD

2.1 Study design

Data was collected during two separate in-service courses (see Figure 2). Both of these courses (In-service course A and B) aimed to support the development of Estonian teachers’ digital literacy and their teacher research skills. The study process of the In-service course A followed the structure described in section 1.2.1. Thus, research-related activities were embedded into the learning assignments throughout the course. For In-service course B a more traditional approach was used and the teacher research was presented and taught in depth as a special session.

In order to answer the research questions two short questionnaires were developed – Teacher research Questionnaire 1 (TQ1) and Teacher research Questionnaire 2 (TQ2): (a) TQ1 had four questions: the first two were background questions (gender and length of teaching service), the third question asked teachers to describe phases that are necessary for conducting research and the fourth question asked teachers to name any research-related activities that they apply in their lessons. TQ1 was used with teachers who participated in In-service course A.

(b) TQ2 had also four questions. Similar to the TQ1 the first two questions were background questions. The third question aimed to understand how teachers describe teacher research and the
fourth question focused on detecting what are the main obstacles for conducting teacher research. TQ2 was used with teachers who participated in In-service course B. Both of these questionnaires were filled in at the beginning of the in-service courses.

2.2 Sample

Teachers voluntarily registered to the in-service courses. Forty nine teachers (seven male and 42 female teachers) selected In-service course A and 29 teachers (all female) enlisted for In-service course B. The distribution based on the length of teaching service is presented in Table 1.

Table 1. Number of participants according to the length of their teaching service for each sample.

<table>
<thead>
<tr>
<th>Sample</th>
<th>Length of teaching service (years)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0-5</td>
</tr>
<tr>
<td>In-service course A</td>
<td>9</td>
</tr>
<tr>
<td>In-service course B</td>
<td>8</td>
</tr>
</tbody>
</table>

2.3 Data analysis

The data analysis began with applying simple descriptive statistics. Teachers’ open-ended answers from both questionnaires (TQ1 and TQ2) were analyzed using qualitative content analysis. The method is described as a widely used approach for analyzing text data [9]. In addition, hierarchical cluster analysis was used to identify teacher groups based on their understanding about teacher research.

3 RESULTS

3.1 How do teachers understand the concept of teacher research?

Teachers’ answers to the question “What does a teacher researcher do?” (in TQ2) were analyzed and compared to the aims of teacher research described by Admiraal et al [3].

According to qualitative content analysis the teacher responses could be categorized into four areas depending on what was the primary focus expressed in the response:

a) analyzing teaching or learning (e.g., “A teacher who analyses his or her teaching”, “A teacher who is interested in understanding the whole learning process and perceives the need to analyze it”): fits with the first aim (improving teaching practice)

b) solving problems (e.g., “A teacher who finds solutions to problems”, “A teacher who knows how to state research questions, hypotheses and plan experiments”): fits with the third aim (extending the knowledge base)

c) professional development (e.g., “A teacher who wants to become a better teacher”, “A teacher who is interested in continuous development”): fits with the second aim (increasing professionalism)

d) reflection (e.g., “A teacher who is able to reflect on his or her teaching”, “A teacher who reflects on others work”): fits with the second aim (increasing professionalism)

The next analysis focused on identifying teachers understanding about the phases that are necessary for conducting research. The input for this came from the answers that teachers submitted in TQ1. For this analysis the five inquiry phases [7] were used to categorize teachers’ responses. If a teachers’ response mentioned aspects of a specific inquiry phase then they received one point, otherwise zero points. After categorization, a hierarchical cluster analysis was conducted to group the teachers based on their knowledge about teacher research. As a result of the analysis three clusters were generated (see descriptive statistics in Table 2):

a) Inquirers (n=10): teachers who described the whole research process, mentioning necessary phases and structuring phases into a sequence that is common for research processes. The background of these teachers was in science and math. It might be explained by the fact that
inquiry as a method is embedded into the Estonian national curricula and a large variety of teacher training courses to support teacher inquiry skills have been implemented.

b) Analyzers (n=17): teachers who focused on collecting evidence aiming to analyze their teaching. They described activities that relate to the investigation and conclusion phases. Most of the teachers in this group were language teachers.

c) Seekers (n=22): teachers who described activities that are common to the orientation phase, where they mention searching for information, setting goals, getting acquaintance with the topic. They were the only group that does not mention activities related to research question or hypothesis formulation. Most of the teachers in this group were teaching social sciences or art.

### Table 2. Descriptive statistics between different clusters.

<table>
<thead>
<tr>
<th>Clusters</th>
<th>Orientation (max1)</th>
<th>Conceptualisation (max1)</th>
<th>Investigation (max1)</th>
<th>Conclusion (max 1)</th>
<th>Discussion (max1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inquirers n=10</td>
<td>Mean: 0.90</td>
<td>Mean: 0.80</td>
<td>Mean: 0.90</td>
<td>Mean: 0.80</td>
<td>Mean: 0.60</td>
</tr>
<tr>
<td></td>
<td>Std. Dev: 0.316</td>
<td>Std. Dev: 0.422</td>
<td>Std. Dev: 0.316</td>
<td>Std. Dev: 0.422</td>
<td>Std. Dev: 0.516</td>
</tr>
<tr>
<td>Analyzers n=17</td>
<td>Mean: 0.76</td>
<td>Mean: 0.12</td>
<td>Mean: 0.88</td>
<td>Mean: 0.88</td>
<td>Mean: 0.29</td>
</tr>
<tr>
<td></td>
<td>Std. Dev: 0.437</td>
<td>Std. Dev: 0.332</td>
<td>Std. Dev: 0.332</td>
<td>Std. Dev: 0.332</td>
<td>Std. Dev: 0.470</td>
</tr>
<tr>
<td>Seekers n=22</td>
<td>Mean: 0.41</td>
<td>Mean: 0.00</td>
<td>Mean: 0.27</td>
<td>Mean: 0.14</td>
<td>Mean: 0.18</td>
</tr>
<tr>
<td></td>
<td>Std. Dev: 0.503</td>
<td>Std. Dev: 0.000</td>
<td>Std. Dev: 0.456</td>
<td>Std. Dev: 0.351</td>
<td>Std. Dev: 0.395</td>
</tr>
</tbody>
</table>

### 3.2 What are the main obstacles for conducting teacher research?

The outcomes of analyzing teachers’ responses about obstacles for conducting teacher research revealed several obstacles. Table 3 presents frequencies of different obstacles that teachers brought out. The results are not surprising as the most frequent obstacle is lack of time (29% of all respondents). It is coherent with studies which claim that time is an issue for doing research related activities [7].

### Table 3. Main obstacles for conducting teacher research.

<table>
<thead>
<tr>
<th>Obstacles</th>
<th>Length of service (years)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0-5</td>
</tr>
<tr>
<td>Low level of knowledge and skills</td>
<td>18%</td>
</tr>
<tr>
<td>Lack of time</td>
<td>63%</td>
</tr>
<tr>
<td>Lack of motivation</td>
<td>-</td>
</tr>
<tr>
<td>Indolence</td>
<td>19%</td>
</tr>
<tr>
<td>High workload</td>
<td>-</td>
</tr>
<tr>
<td>Lack of resources</td>
<td>-</td>
</tr>
</tbody>
</table>

The second frequent obstacle is a low level of knowledge and skills (24%). Six teachers out of 49 stated that they do not have any obstacles. If we compare teachers by their length of service, then we see that lack of time is the main issue for teachers how have just started their teaching. It seems that they are more involved with planning their teaching activities (lesson plans etc.). Of interest is the group of teachers who worked at school longer than five years but less than ten years. They reported
that for them the main obstacle is laziness or indolence. They emphasized that it is good to be in the
comfort zone where you just do as much as needed. In the case of teachers who have worked longer
than ten years the key issue in addition to time, knowledge and skills is high workload. Workload
usually increases when new responsibilities like different administrative tasks are taking part of their
professional role [1].

4 CONCLUSIONS
Teacher research is certainly a topic that needs further investigation in order to offer support that helps
decrease the level of obstacles for conducting research. The current study is a small reflection on
teachers and their understandings about teacher research. The results showed that understanding
among teachers is different but still fits with the outcomes emphasized in the literature. Teachers
reported that teacher research has a positive effect on their teaching and their professional
development. Also, cluster analysis highlighted three main groups of teachers who are fully (Inquirers)
or partially (Seekers and Analyzers) ready for teacher research. Identifying these types of teachers
can be used by ‘teacher trainers’ as useful input for planning research related in-service courses.
Finally, the answer to the question in the title of this paper is definitely “to be teacher researcher”.

ACKNOWLEDGEMENTS
The author would like to thank all the teachers who participated in this study and the good colleagues
from the Centre of Educational Technology at the University of Tartu.

REFERENCES
[1] C. K. Bennett. Teacher-Researchers: All Dressed Up and No Place to Go?. Educational
teacher research in history and geography classrooms, Educational Action Research, 25, 316–
331, 2017. DOI: 10.1080/09650792.2016.1152904
development course, Teaching Education, 27, 88–102, 2016. DOI: 10.1080/10476210.2015.1042855
[7] K. M. Zeichner. Teacher research as professional development for P–12 educators in the USA
health research, 15, 1277–1288, 2005.