Teaching and Teacher Education 47 (2015) 42–61

Contents lists available at ScienceDirect

Teaching and Teacher Education

journal homepage: www.elsevier.com/locate/tate

Mapping teacher education domain: A document co-citation analysis from 1992 to 2012

Hüseyin Özçınar*

Pamukkale University, Kınıklı, Denizli, 20020, Turkey

HIGHLIGHTS

- The study was carried out via document co-citation analysis, a bibliometric method.
- The study provides insight into the intellectual formation of the teacher education domain.
- The teacher education domain is comprised of a number of specialties.
- None of the specialties is advanced enough to be regarded as the principal trend in the domain.

ARTICLE INFO

Article history:
Received 13 April 2014
Received in revised form
7 December 2014
Accepted 15 December 2014
Available online

Keywords:
Teacher education
Bibliometrics
Document co-citation analysis
PFNET analysis

ABSTRACT

The aim of the present study is to identify the structure of the research base for teacher education as a scientific discipline and changes in the structure of this domain between 1992 and 2012. The study was carried out using document co-citation analysis, a bibliometric method. Document co-citation analysis shows that the domain of teacher education is characterized by a number of specialties; however, none of them are sufficiently developed to be regarded as the principal trend in the domain.

1. Introduction

Teacher quality and educating high-quality teachers have emerged as fundamental problems to be solved by nations since the correlation between education and economy is becoming more and more apparent, and the principal factor in student achievement is teacher quality (Cochran-Smith, 2008). The primary way of enhancing teacher quality is to base teacher education on the ground of robust research (Cooney, 1994). This requires more discussion of the basis for research on teacher education. As Cochran-Smith and Fries (2005, p. 69) put it:

> In many of the most important contemporary debates about teacher quality and teacher preparation, the central focus-—at least on the surface—is research itself, particularly on the fundamental question of whether there is a research basis for teacher education and, if so, what that research base suggests.

Recent years have witnessed a closer relationship between educational policies and the relevant research bases. According to Cochran-Smith (2008, p. 11), the underlying idea behind reforms in the U.S. is that, "the implementation of research-based policies regarding teacher education will solve the teacher supply problem and enhance teacher quality, thus leading to increased pupil achievement." Similarly, European scholars have agreed in recent years that a basis for research on teacher education should be formed. Although strategies vary from one country to another, certain political patterns seem to be emerging as a research base (Arreman & Weiner, 2007). Arreman (2005) summarizes the strategies related to the construction of a basis for research in the European nations thus:

> In Finland, Sweden, and Portugal, the aim has been to make teacher education a research-based field (Erixon, Frånberg, Kallós, 2001). Alternatively, in the UK, it has been to raise the

* Tel.: +90 05326335401.
E-mail address: hozcinar@pau.edu.tr.

http://dx.doi.org/10.1016/j.tate.2014.12.006
0742-051X/

professionalism of teacher educators by government-led measures derived from 'evidence-based' (Weiner, 2002, p. 279) or 'brute data' (Edwards, 2001, p. 20) research. In other European countries, for example, Austria and Spain, research in teacher education has been mainly oriented towards integrating theory and practice, in order to promote democratic values of equity and multiculturalism (Gassner & Schratz, 2001; Zufiaurre, 2001) (p.215).

1.1. A research basis for teacher education

The significance of a basis for research on teacher education is often emphasized as a critical requirement for the education of high-quality teachers. Until recently, however, the research base for teacher education was blamed for being narrow (Houston, 1990) and unguided (Zimpher & Ashburn, 1992). This section reviews the teacher education research that has been carried out in different countries and tries to provide a general view of teacher education research. Bergem, Björkqvist, Hansén, Carlgren, and Hauge (1997) examined the scope of and changes in teacher education research from the 1950s to the 1990s in Scandinavia. In their review of the research carried out in Norway, Sweden and Finland, the researchers asserted that there was a great variety of research in the field of teacher education, and that the patterns of change of research in related fields were quite similar both within and beyond the other Nordic countries during the research period (p. 450). The researchers proved that research had focused most on teacher behavior in the 1950s and later shifted to issues such as teacher cognition and student–teacher interaction. Their research also demonstrated that the use of simple quantitative tools as a research method decreased over time, while the use of the qualitative research methods such as classroom field studies, case studies, participant observation, group interviews and action research increased.

Cameron and Baker (2004) examined the teacher education research conducted between 1993 and 2004 in New Zealand using the annotated bibliography and literature review method. The researchers found that the research they examined could be classified under six main themes according to its primary focus. These themes were: student teachers (selection of programs for initial teacher education, student teacher demographics, student teacher backgrounds and beliefs), teacher educators, the impact of particular courses and interventions, associate teachers and practicum, program evaluations (evaluations by researchers from institutions, external evaluations) and beginning teachers. McGee (1999) criticized teacher education research in New Zealand as fragmented, small scale research carried out by individuals, and the researchers found that this was accurate.

Murray, Mitchell, and Nuttall (2008) examined the experimental research on initial teacher education and beginning teachers in Australia that was published in peer-reviewed journals from 1995 to 2004. The researchers grouped the research according to topics. Most of the research carried out in that period was about reflective thinking in teacher education, followed by practicum supervision and mentoring, the use of online learning, pre-service teachers' information and communications technology self-efficacy, primary pre-service teachers' attitudes and beliefs regarding science, pre-service teachers' general conceptions of teaching and learning, primary pre-service teachers' attitudes and beliefs related to mathematics; primary pre-service teachers' mathematics subject content knowledge, graduates' perceptions of their pre-service education, primary pre-service teachers' confidence in their ability to teach science and pre-service teachers' wellbeing. The researchers stated that this topic distribution supports Tisher's (1990) claim that the field of teacher education research has a quite fragmented structure. The researchers proved that the epistemological basis for the teacher education research is weak, and consists of mostly small scale, isolated research. According to Murray et al. (2008), this is a natural result of the fact that teacher education is a new field which is trying to prove itself. The researchers assert that the funds provided for teacher education research are limited and do not allow for large scale research.

Criticisms of teacher education in different nations frequently claim that, since the field is brand new, it is hard to carry out long term, longitudinal research. It lacks funding. The research structure of the field is fragmented. Work on many significant questions has yet to be carried out, and the work have not been that has been done is insufficient (Bergem et al., 1997; Borko, Liston, & Whitcomb, 2007; Cameron & Baker, 2004; Murray et al., 2008). These limitations of teacher education research, reduce its effect on the process of generating teacher education policies (Murray et al., 2008; Pandey, 2004; Zongyi & Gopinathan, 2001). Research that can show the research structure of teacher education research, and its gaps and tendencies may contribute to the consolidation of its research basis and increase its effect on policy makers by guiding new research (Zongyi & Gopinathan, 2001).

1.2. Mapping scientific fields

Generally, geographic or spatial metaphors like "field of study" and "area of specialization" are used to talk about science. It is supposed that the visualization of abstract and complicated facts by using spatial terms makes it easier for us to comprehend conceptual relationships and developments (Small, 1999). The idea that mapping scientific fields might contribute to the specification of the research structure of scientific fields and that these results might be used by policy makers caused bibliometric mapping methods to be discussed widely (Rip, 1988). Garfield, Malin, and Small (1978) have defined this idea as follows, "Mapping science is an attempt to arrive at a spatial representation of fields and disciplines—and, at a lower level, individual papers and scientists-in which the relative locations of entities is depicted" (p. 192).

The idea that the specialties are the key element of the social and cognitive structures in scientific fields provided a framework to mapping science (Small, 1978). Chubin (1976) describes the position of the specialties in disciplines as follows, "Disciplines form the teaching domain of science, while smaller intellectual units (nestled within and between disciplines) comprise the research domain. Within the sociology of science, these units have been termed 'scientific specialties' (p. 448). Crane (1972) provided the idea of mapping the structures and the relationships of specialties.

The mapping of the scientific specialties or subdomains may contribute to the analysis of the domain sociologically and historically, to the increase of our comprehension about the process of information transfer among scientific domains and to the improvement of relationships between cognitive structures (Small & Crane, 1979). According to Borgman and Furner (2002), the relationships among the sub domains that constitute a scientific domain and the mapping of the improvements in that domain may allow its structure to be comprehended as a historical process and allow predictions to be made about its methods.

Thus, insight into the intellectual structure of teacher education, as well as its evolution and research trends over time, will enable researchers, practitioners and policymakers to b better understand the existing situation and guide their future research. Small (1978) suggested a general method for the examination of the structures and changes in the relationships among the specialties. The basic rule of this method is that changes in social/cognitive situations will be reflected in the citation patterns of the researchers working in the