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Blended learning at pre-service teacher education in Turkey: A systematic review

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Introduction
As a developing country tackling with large cohorts in pre-service teacher education programs and attempting to equip prospective teachers with ICT skills, the literature shows us that there is an increase in blended learning implementations (N= 74) at faculties of education in Turkey.
This systematic literature review aims to assist stakeholders through a research synthesis of blended learning implementations at teacher education programs in Turkey by investigating its impact on academic achievement and learners' attitudes.

Objectives and Research Questions
The aim of this review as declared by the authors is to reveal how blended learning has been implemented in various courses in pre-service teacher education in Turkey.
The following research questions constitute the scope of this review:

1. Does blended learning contribute to academic achievement in pre-service teacher education in Turkey?

2. What attitudes do pre-service teachers have towards blended learning environment?

In examining its impact, online learning tools and particular instructional methods combined with blended learning were to be identified by the authors, as well as major benefits and observed challenges of ICT implementation in blended learning.

Methodology

Design

In order to answer their research questions, the authors adopted a systematic review process to reveal the difference between real and assumed knowledge by compiling all empirical evidence congruent with their pre-specified eligibility criteria.
Upon delineating the scope of the study, they primarily determined the type of studies to be screened in order to collate pertinent empirical evidence.
In the next phase, an extensive literature search was carried out which was followed by screening the results based on the pre-defined criteria. Appraising the included studies and synthesizing findings constituted the final stage of the review.

Search strategy for identification of relevant studies - The authors carried out a systematic search of major databases in order to identify peer reviewed English and Turkish language articles as well as Master theses and Doctorate dissertations related to blended learning. The databases were last accessed on March 20, 2018.

Criteria for inclusion and exclusion of studies in the review - For this systematic review, studies with the following characteristics were included in the research synthesis by the authors. Firstly, studies assessing the effectiveness of blended learning and participants' attitudes in pre-service teacher education in Turkey were investigated. The second major characteristic of these studies is to employ a quantitative research design (i.e., experimental, quasi-experimental, survey) or to include at least a quantitative aspect (i.e., mixed-method, case study) in their data collection procedure. The reason to opt for quantitative studies is that they are regarded as robust studies which can directly attempt to affect a particular variable and reveal more reliable results by controlling threats to internal validity (Cohen et al. 2005; Fraenkel et al. 2015).

Results and Discussion
The authors found that the majority of the reviewed studies assessing the impact of blended learning on pre-service teachers' academic achievement demonstrate its superiority to online learning or conventional instruction. In studies conducted with single groups, they also yield positive outcomes in favor of blended learning.
Likewise, reviewed studies showed them that blended learning courses contribute to pre-service teachers' motivation and their attitudes to technology-integrated courses. In examining its impact, the authors also identified its potential benefits such as fostering student-centeredness, promoting collaboration, and facilitating the process for learners to construct their own knowledge.
The authors found that infrastructure problems and the lack of teacher candidates' self efficacy beliefs pose threats to reap advantages of blended learning.
The most critical and distinct component of blended learning as also confirmed with the authors' findings is its emphasis on face-to-face aspect of instruction whose benefits are heavily underlined by the proponents of constructivist tradition - Dewey (1963) and Vygotsky (1978) - as the fundamental role of social interaction in learning that repels isolation (e.g., as in online learning) and promotes collaboration, negotiation, debate, and peer review. Among Bruner's (1999) four propositions on learners' minds, his model which sees learners as thinkers and active constructors of meaning gains prominence in well-established ICT practices because learning in this view is regarded as a collaborative and intersubjective act fostering teacher-student and student-student interactions.
Considering these traits of social constructivism, the underlying reasons behind the effective implementations of blended learning are likely to facilitate a community of inquiry which balances open communication and provides easy access to knowledge on the internet (Garrisson and Kanuka 2004), and to foster inclusion by encouraging introvert students to express themselves through online discussion forums (Perrow 2017).
These results lead the authors to consider blended learning as a distinct delivery mode likely to

contribute to academic achievement, assist learners in developing positive attitudes towards the courses, and advance ICT implementations at pre-service teacher education programs.
The way ICT integration is handled at pre-service teacher education matters because of the fact that teacher candidates are mostly offered isolated computer courses. Highlighting the importance of infusing technology into teacher education programs as a necessity, not a luxury, Kortecamp and Croninger (1996) point out that the lack of requisite skills and knowledge could constitute a distinct barrier for pre-service teachers upon their entry to the job market.

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