



## Review article

## Effects of equity-oriented teacher education on preservice teachers: A systematic review



Wei Liao <sup>a,\*</sup>, Chonggao Wang <sup>b</sup>, Jingtian Zhou <sup>a</sup>, Zhaodi Cui <sup>a</sup>, Xiaohong Sun <sup>a</sup>, Yanling Bo <sup>a</sup>, Miao Xu <sup>a</sup>, Qian Dang <sup>a</sup>

<sup>a</sup> Center for Teacher Education Research, Key Research Institute of Ministry of Education of China, Beijing Normal University, Beijing, 100875, China

<sup>b</sup> School of Special Education, Faculty of Education, Beijing Normal University, Beijing, 100875, China

## HIGHLIGHTS

- Identifies a system of equity-oriented teacher education (EOTE) interventions.
- EOTE is enacted at programmatic, curricular, pedagogical, and activity levels.
- EOTE influences preservice teachers' (PSTs) disposition, knowledge, and performance.
- Proposes a conceptual reference for studying EOTE's effects on PSTs.
- Outlines directions for future research to advance the field of EOTE.

## ARTICLE INFO

## Article history:

Received 13 November 2021

Received in revised form

5 May 2022

Accepted 18 July 2022

Available online xxx

## Keywords:

Preservice teacher education

Equity

Diversity

Social justice

Systematic review

## ABSTRACT

This systematic review synthesizes the empirical evidence of equity-oriented teacher education's (EOTE) effects on preservice teachers (PSTs) generated from 13 countries and published in 58 articles between 2011 and 2020. Looking across the literature, we identify a system of EOTE interventions enacted at programmatic, curricular, pedagogical, and activity levels and their differing effects on PSTs' dispositions, knowledge, and performance for equity-oriented teaching. We highlight these findings' conceptual and practical contributions, raise questions about measuring equity, tracing long-term effects, and balancing equity with other values, and outline directions for future research to advance the field of EOTE.

© 2022 Elsevier Ltd. All rights reserved.

## Contents

1. Introduction .....	2
2. Review of earlier reviews .....	2
3. Methods .....	3
3.1. Forming the pool of literature .....	3
3.2. Classifying the selected studies .....	3
3.3. Identifying, analyzing, and synthesizing the empirical evidence .....	4
3.4. Limitations .....	5
4. Findings .....	5
4.1. Equity-oriented teacher education interventions .....	5
4.1.1. Programmatic configurations .....	6

\* Corresponding author. Center for Teacher Education Research, Key Research Institute of Ministry of Education of China, Beijing Normal University, 19 Xijiekouwai St, 607 Yingdong Building, Beijing, 100875, China.

E-mail address: [liaowei@bnu.edu.cn](mailto:liaowei@bnu.edu.cn) (W. Liao).

4.1.2.	Curricular settings .....	7
4.1.3.	Pedagogical approaches .....	7
4.1.4.	Teaching and learning activities .....	8
4.2.	Effects of EOTE interventions on PSTs .....	8
4.2.1.	Positive effects .....	8
4.2.2.	Negative and null effects .....	11
5.	Discussion and implications for future research .....	12
	Funding .....	13
	Authorship contributions .....	13
	Declaration of competing interest .....	13
	References .....	13

## 1. Introduction

Equity is one of the few core values that people in different societies persistently pursue over time (Hatfield et al., 2011). Briefly speaking, equity means the quality of being fair and impartial. Scholars from political science, sociology, psychology, among other disciplines, have extensively examined the meanings, constructs, and values of equity (Schillinger, 2018). The extant examinations vary, but they consensually suggest that equity can serve as a value orientation to guide people to treat each other fairly in social interactions.

Everyone would wish to live in an inclusive, equitable, and just school and society, but the reality is disappointing. In schools, students who are female, non-white, disabled, poor, sexual minorities, among other unfavorable conditions, have been marginalized, disadvantaged, and oppressed for a long time (UNESCO, 2020). Such a situation seems worsening as the notions and practices of standardization, performativity, and competition continue to penetrate education across the globe (Hill et al., 2009). The situation outside schools is even more concerning. Many countries chronically suffer from equity-related issues, such as structural discriminations against certain groups of people, widening income gaps between the rich and the poor, and the shrinking odds for individuals' social mobility (United Nation, 2020).

Previous studies (e.g., Darling-Hammond et al., 2010; Ingvarson & Rowley, 2017) have shown that teacher education programs can significantly impact their graduates' teaching performance, further influencing student learning and school improvement. Morally speaking, education, especially public education, should serve as "the great equalizer" of the conditions of human beings in a society (Bernardi & Ballarino, 2016). Considering the growing magnitudes of educational and social inequity and the foundational role that teacher education plays in educational and social development, scholars from different parts of the world have explored how to enhance equity within and beyond teacher education in the past few decades.

For instance, Cochran-Smith (2010) constructed a theory of teacher education for social justice to highlight the importance of equitable learning opportunity, respect for social groups, and acknowledging and dealing with tensions in preparing teachers for the increasingly diverse classrooms in the United States. Drawing on their practical explorations in New Zealand and survey of international research evidence, Grudnoff et al. (2021) identified a series of crucial practices for enhancing equity in teaching and teacher education, such as selecting equity-related contents, creating equity-supported learning environments, and recognizing equity-related problems in schooling. Francis et al. (2017) examined the binarized and hierarchical view of knowledge reflected in a sample of British and Australian curriculum policies. They argued that such a problematic view had contributed to the ambiguity of

what an equitable and just education system looked like and called for further clarification of equity and social justice in teaching and teacher education. Similar explorations have also been witnessed in Italy, France, South Korea, and many other countries (Cho & Choi, 2016; Mincu & Granata, 2021).

The international efforts at addressing equity-related issues in teacher education have presented varying conceptualizations of equity, origins of inequity, and approaches to tackling inequity. However, they all place equity at the heart of teacher education and use it as a "compass" to orient the practices of preparing teachers. Therefore, in this article, we use Equity-Oriented Teacher Education (EOTE) as an umbrella term to refer to the teacher education theories, models, and practices aimed at advancing equity, fairness, and justice in education and society (Liao, 2021a).

With decades of collective efforts worldwide, the field of teacher education has significantly advanced the practices of EOTE. For instance, many teacher education programs have integrated equity-focused courses (e.g., critical theories, multicultural education) into their curricula, supporting preservice teachers (PSTs) to develop equity-oriented pedagogical practices (e.g., culturally responsive/relevant/sustaining teaching), and reforming programmatic staffs, structures and cultures (e.g., diversifying teacher educator workforce) to be more inclusive to all PSTs (Cochran-Smith, 2020; Gorski, 2009; Kaur, 2012; Liao et al., 2021b; Villegas & Lucas, 2002). Coupled with the spread of these and other EOTE practices, a considerable and growing number of studies—both theoretical and empirical ones—have been conducted to explore the foundations, features, values, functions, practices, impact, and improvement of EOTE. Systematically reviewing this rich body of literature can help clarify the knowledge base for better understanding, enacting, and further advancing EOTE.

## 2. Review of earlier reviews

To date, a few scholars have reviewed the research literature on EOTE with different foci (Cochran-Smith, 2020; Goodwin & Darity, 2019; Kaur, 2012; Mills & Ballantyne, 2016; Pugach et al., 2019). For instance, Kaur (2012) reviewed a selection of articles that focused on equity and social justice published in *Teaching and Teacher Education* since the inception of this journal. This review identified a global move towards creating teacher education programs with explicit focus on equity and social justice and concerns regarding how to effect real changes as envisioned by such programs. Mills and Ballantyne (2016) synthesized 23 journal articles on social justice and teacher education that were published between 2005 and 2015. They found that the reviewed studies mainly focused on student teachers' understandings of social justice, used small-scale qualitative research methods, and reported mixed findings on the effects of teacher education on PSTs' beliefs.

Cochran-Smith (2020), one of the leading scholars on EOTE,

recently drew on three examples of her own work, named “working the dialectic,” “editorializing the field,” and “reclaiming accountability,” to shed light on how the landscapes of teacher education for equity and social justice, particularly referencing to the U.S. context, have been transforming in the past forty years. A more recent review was conducted by Reagan and Hambacher (2021), which also focused on EOTE practices in the North American context. The authors synthesized a large number of empirical studies published in the U.S. and Canada and identified issues related to PSTs’ identity, resistance, and emotions in learning to teach for equity and social justice.

Previous reviews have added to the literature several useful overviews of the expanding knowledge base of EOTE. However, an important pillar of the knowledge base—the effects of EOTE on PSTs—have not yet been adequately examined in the previous reviews (Sleeter, 2014). PSTs are the first-order target group and direct beneficiaries of teacher education programs. Only when EOTE bring desirable, comprehensive, and empirically verified changes to PSTs can EOTE lives up to its mission of enhancing equity in schools and society. Otherwise, EOTE would be merely an empty slogan or lip service (Zeichner, 2010).

Some previous studies have identified several effective EOTE practices in enhancing PSTs’ beliefs, knowledge, and skills for enacting equity-focused teaching, such as teacher educators’ explicit modeling of equity-oriented pedagogies (Acquah & Szelei, 2020), PSTs writing critical autobiographies (Boyd & Noblit, 2015), and learning across diverse fields (Anderson & Stillman, 2011; Nguyen & Zeichner, 2021). Some other studies, however, also reported unintended or counteractive effects of EOTE practices on PSTs, such as unchallenged deficit views (Kim & Choi, 2020), resistance to critical pedagogy (Kondo & Bracho, 2019), and even increased tendency to leave teaching altogether (Murdock & Hamel, 2016). These mixed findings call for more focused, careful, and systematic examinations of EOTE’s effects on PSTs. As an active response to this call, we conducted a systematic review of 58 empirical studies conducted in 13 different national contexts and published in peer-reviewed English journals during the past decade (2011–2020).

Two overarching research questions guided our analysis. First, what EOTE interventions have been reported in the literature? Second, what effects have the reported EOTE interventions made on PSTs? As a team of teacher education scholars, practitioners, and learners dedicated to EOTE, we aim to use this review study to deepen our understanding of EOTE, reflect on its strengths and the areas needing improvement, and help advance the research and practice of EOTE forward.

### 3. Methods

#### 3.1. Forming the pool of literature

We followed the Preferred Reporting Items for Systematic Review and Meta-Analyses (PRISMA) procedures (Moher et al., 2009) and formed the pool of literature for review with multiple rounds of database searches and screening (see Fig. 1).

In particular, we searched four databases (i.e., Scopus, Web of Science, Google Scholar, and ERIC) that were commonly used in educational research and covered a wide range of related research literature for this review. We pulled studies out of these databases that each met the following criteria: (1) peer-reviewed English journal article; (2) containing both “teacher education” (or its synonyms including “teacher preparation,” “teacher training,” “teacher learning”) and “equity” (or “equitable,” “equality,” “equal,” “fairness,” “fair,” “justice,” “just”) in title, abstract, or keywords; (3) published between 2011 and 2020. The searches yielded a total of

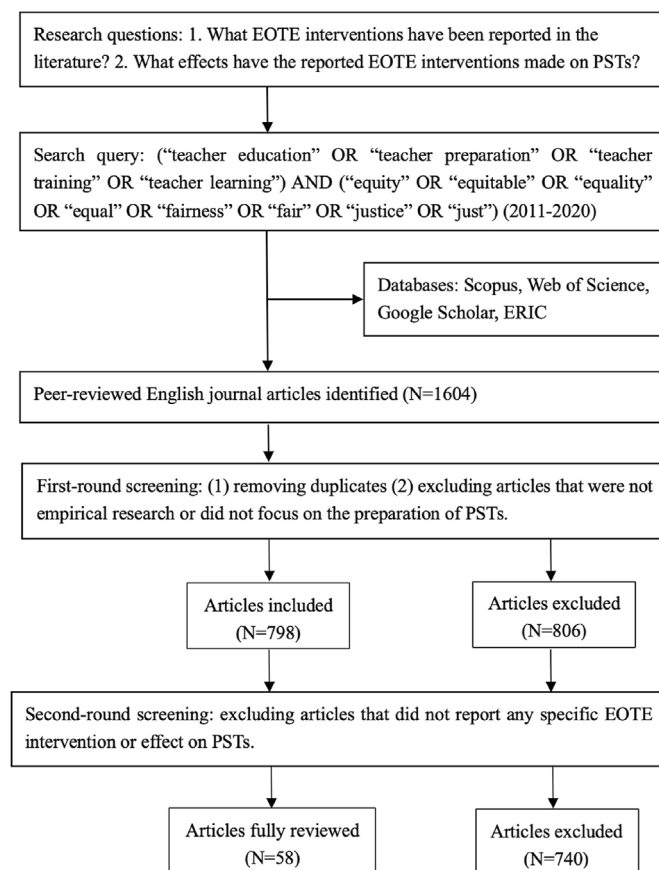


Fig. 1. PRISMA flow diagram.

1604 studies.

In the first round of screening, we removed duplicates and then narrowed the pool to 798 articles by applying two additional criteria: (1) was empirical study; (2) focused on the preparation of preservice teachers. We define empirical as “derived from or denoting experimentation or systematic observations as the basis for conclusion or determination, as opposed to speculative, theoretical, or exclusively reason-based approaches” (VandenBos, 2007, p. 327). Thus, empirical studies refer to a way of gaining knowledge by means of direct and indirect observation or experience.

Each article was read by two of the authors to be decided on whether to be included. When a pair of authors disagreed, all other authors were involved to discuss and make a final decision. In the second round of screening, we also worked in pairs to read the 798 articles several times to check whether an article reported: (1) a specific intervention of EOTE (2) any effect of the studied intervention on PSTs. Only when a study met both criteria was it selected for further analysis. We also used the same procedure as we used in the first round of screening to ensure the inter-author agreement on the inclusion or exclusion of an article. As a result, we excluded 740 additional articles and formed the final pool of literature that included 58 articles for the review. Table 1 lists core information of the selected articles.

#### 3.2. Classifying the selected studies

The distributions of the studies’ national contexts, research approaches, and sources of evidence have presented several features that can shed light on the current research landscape on EOTE (see Table 2).

**Table 1**

The Author(s), year of publication, and research context of the 58 selected studies.

Author(s)	Year	Context	Author(s)	Year	Context
1.Acquah & Szelei	2020	Finland	30.Lillge & Knowles	2020	US
2.Anderson & Stillman	2011	US	31.Liu et al.	2020	US
3.Anderson et al.	2015	Canada	32.Lund & Lee	2015	Canada
4.Baily et al.	2014	US	33.Max	2017	US
5.Baloche	2014	US	34.Newton et al.	2020	US, Germany, Honduras, Tanzania
6.Bleicher	2011	US	35.Nganga	2019	US
7.Boyd & Noblit	2015	US	36.Nguyen & Zeichner	2021 <sup>a</sup>	Vietnam
8.Broderick & Lalvani	2017	US	37.Nichols & Sullivan	2016	US
9.Byker & Marquardt	2016	US	38.Nowell & Poindexter	2019	US
10.Chong et al.	2020	China (HK)	39.Ohito	2016	US
11.Christopher & Taylor	2011	US	40.Payne & Smith	2012	US
12.Cobb & Sharma	2015	Canada	41.Petersen & Henning	2018	South Africa
13.Conklin & Hughes	2016	US	42.Rahatzad et al.	2013	Honduras
14.Convertino	2016	US	43.Reagan et al.	2016	US
15.Dodman et al.	2019	US	44.Riley & Solic	2017	US
16.Dyce & Owusu-Ansah	2016	US	45.Riley et al.	2019	Australia
17.Ellis et al.	2016	UK	46.Ritchie et al.	2013	US
18.Gachago et al.	2014	South Africa	47.Sharma et al.	2013	US, Honduras
19.Grudnoff et al.	2016	New Zealand	48.Shelley & McCuaig	2018	Australia
20.Helmer	2014	US	49.Solic & Riley	2019	US
21.Hennig et al.	2020	Canada	50.Sosa-Provencio et al.	2019	US
22.Howard & Ticknor	2019	US	51.Stanton & Gonzalez	2011	US
23.Hubbard & Swain	2017	US	52.Tan & Padilla	2019	US
24.Iyer et al.	2018	US	53.Thompson	2012	Canada
25.Kang & Martin	2018	South Korea	54.Tinkler et al.	2019	US
26.Kang & Zinger	2019	US	55.Tinkler & Tinkler	2016	US
27.Knif & Kairavuori	2020	Finland	56.Tinkler & Tinkler	2013	US
28.Kraehe & Brown	2011	US	57.Whipp	2013	US
29.Lemley	2014	US	58.White & Murray	2016	UK

<sup>a</sup> This paper was published online in 2019 at the time of the review, and recently it has been included in an issue in 2021.

First, most studies ( $n = 38$ ) were conducted exclusively in the U.S., while twelve other national contexts were identified, including Canada ( $n = 5$ ), U.K. ( $n = 2$ ), Australia ( $n = 2$ ), South Africa ( $n = 2$ ), Finland ( $n = 2$ ), Honduras ( $n = 1$ ), New Zealand ( $n = 1$ ), South Korea ( $n = 1$ ), Vietnam ( $n = 1$ ), China (Hong Kong) ( $n = 1$ ), and in cross-national contexts (i.e., U.S., Honduras; U.S., Honduras, Germany, Tanzania) ( $n = 2$ ). This distribution echoed Mills and Ballantyne's (2016) conclusion that the U.S. was the dominant context for research on EOTE. But this review covered several new contexts that previous reviews did not cover, such as South Africa, Vietnam, and China (Hong Kong).

According to Mertler's (2021) widely used taxonomy of educational research, we found that most of the reviewed studies adopted a qualitative approach ( $n = 46$ ) while other studies used the mixed-methods approach ( $n = 10$ ) or action research approach ( $n = 2$ ); no single study exclusively used the quantitative research approach. Some studies ( $n = 10$ ) used the longitudinal study design to trace the effects of EOTE over time and most of them collected data twice, before and after the EOTE interventions which lasted two months to two years. Because most of these studies used qualitative research approaches as their overarching design, they did not use a standardized, quantitative instrument to measure and evaluate the effects. In terms of data collection methods, many studies capitalized on interviews ( $n = 39$ ), observation ( $n = 17$ ), and artifacts collection ( $n = 50$ ) to generate qualitative forms of data. Some other studies ( $n = 17$ ) also used the questionnaire to enrich their evidence bases with quantitative data.

In short, these methodological distributions confirmed previous reviews' (e.g., Mills & Ballantyne, 2016) observation that EOTE research predominantly used qualitatively-oriented research approaches and evidentiary bases.

### 3.3. Identifying, analyzing, and synthesizing the empirical evidence

Treating the empirical evidence in the selected studies as the raw data, we analyzed the data in three main steps. First, we identified the EOTE interventions and their effects on PSTs in each of the studies. This step led to a wide range of EOTE interventions (e.g., modeling, autobiography, critical pedagogy, diversity course, study-abroad program) and the effects on PSTs (e.g., awareness of equity, equity-oriented pedagogical knowledge, equity-oriented teaching performance during practicum).

Next, we used a combination of inductive and deductive analysis to categorize the EOTE interventions and their effects into groups. As informed by previous research on teacher education interventions (Cochran-Smith & Villegas, 2015; Kohli et al., 2022), we used program-, curriculum-, pedagogy-, and activity- as a general framework to deductively categorize the identified EOTE interventions into four general levels. Similarly, we draw on a dominant conceptualization of teacher learning (CCSSO, 2013; Korthagen, 2017) and deductively coded the effects on PSTs into three dimensions: disposition, knowledge, and performance.

Then, we inductively analyzed the coded data to generate sub-categories within each category of the EOTE interventions and their effects. For instance, at the curricular level of EOTE interventions, we identified two sub-categories of interventions: university courses (e.g., thematic lectures or seminars) and field experiences (e.g., having teaching practicum in multiple sites). Similarly, for the EOTE's effects on the dispositional dimension, we developed four nuanced and incremental levels of effects, including raising awareness of inequity, (re)examining assumptions about inequity, positioning as agents of addressing inequity, and developing commitment to equity. All authors were involved in making



**Table 2**  
Classifications of the 58 selected studies.

National Contexts	Research Approaches	Sources of Evidence
<b>US: 38</b> (2,4,5,6,7,8,9,11,13,14,15,16,20,22,23,24,26,28,29,30,31,33,35,37,38,39,40,43,44,46,49,50,51,52,54,55,56,57) <b>Canada: 5</b> (3,12, 21,32, 53) <b>UK: 2</b> (17,58) <b>Australia: 2</b> (45,48) <b>Finland: 2</b> (1,27) <b>South Africa: 2</b> (18,41) <b>Honduras: 1</b> (42) <b>New Zealand: 1</b> (19) <b>South Korea: 1</b> (25) <b>Vietnam: 1</b> (36) <b>China (Hong Kong): 1</b> (10) <b>Cross-national: 2</b> (34,47)	<b>Qualitative: 46</b> (1,2,5,7,8,9,12,13,14,18,19,20,21,22,24,25,26,27,28,30,31,32,33,35,36,37,38,39,40,41,42,44,45,46,47,48,49,50,51,52,53,54,55,56,57,58) <b>Quantitative: 0</b> <b>Mixed-methods: 10</b> (3,4,6,10,15,16,17,23,34,43) <b>Action research: 2</b> (11,58)  <b>Longitudinal: 10</b> (7,10,13,16,23,24,29,32,44,49)	<b>Interview: 39</b> (2,3,4,6,10,13,15,16,17,18,20,21,22,23,24,25,26,28,29,30,32,34,35,36,37,38,39,40,41,42,44,46,47,48,49,53,54,57,58) <b>Observation: 17</b> (2,4,20,21,26,29,30,32,37,41,42,43,48,49,51,52,54) <b>Artifact: 50</b> (1,2,4,5,6,7,8,9,11,12,13,14,15,17,19,20,21,22,24,25,26,27,28,29,30,31,32,33,35,36,37,38,39,41,42,43,44,46,47,48,49,50,51,52,53,54,55,56,57,58) <b>Questionnaire: 17</b> (3,4,6,10,11,15,16,17,19,23,24,30,34,39,43,54,55)

Note. The integers in the brackets are the serial numbers in Table 1. The sum of the counts in the column of "Sources of Evidence" is greater than 58 because some studies have drawn on multiple sources to generate evidence for their research.

collective decisions on developing, naming, and defining the categories and sub-categories and allocating the 58 selected studies into the analytical framework.

Third, we used a qualitative cross-tabulation analysis (Hai-Jew, 2019) to establish the links between EOTE interventions and their effects on PSTs. As shown in Table 4, we listed the four levels of EOTE interventions vertically in the first column and listed the nine sub-dimensions of effects (nested within the three major dimensions) horizontally in the first row. Then, we mapped the 58 studies in the 36 cells (4\*9) according to the specific EOTE interventions and their effects on PSTs reported in each study. For instance, Baily et al. (2014) (i.e., the 4th study in Table 1) examined how a U.S. teacher preparation program called "Education for Social Change (ESC)" influenced PSTs' perspectives related to teaching and education. The ESC program systematically fashioned its mission, curriculum, field placement, and faculty collaboration to be centered around preparing educators to "addresses issues of power, privilege, social justice, and diversity" (p. 253). Drawing on a rich set of interview and textual data, the study found that ESC's programmatic interventions had effectively raised the program students' awareness of (in)equity. Therefore, we assigned Bailey et al.'s (2014) study to the most top-left cell in Table 3 where "Programmatic configurations" and "Raising awareness of inequity" intersect.

Worthy of note is that a study could be assigned to more than one cell if it reports more than one level of EOTE intervention or more than one dimension of effect on PSTs. After mapping all the studies in the 36 cells, we added the count of studies in a cell. A greater count in a cell means that more studies have fallen into this cell and suggests a stronger evidentiary base that supports the relationship between the corresponding EOTE intervention and the effect on PSTs. As similarly experienced by the authors of previous reviews (e.g., Conklin & Hughes, 2016), we found it challenging to fit some studies into the categories we established for analysis. In such situations, we perused the study further, sought external experts' opinions, and initiated group discussions to make a collective decision based on the most salient features of the EOTE interventions and the reported effects on PSTs. We acknowledge the inevitable subjectivity involved in our decisions of categorizing a study in one group over another.

### 3.4. Limitations

One limitation of this review study is that how we formed the pool of literature might have excluded journal articles that did not include equity-related terms in their titles, abstracts, or keywords

but were, in essence, focused on the topic of this review. In addition, we did not include scholarships in other forms (e.g., unpublished dissertations, books) or languages that might be related to this review. Second, our decisions to include or exclude an article were inevitably subjective. Thus, we acknowledge that the reviewed studies are by no means exhaustive. We call for future studies to broaden their search scopes and capitalize on advanced technologies such as artificial intelligence (Schoeb et al., 2020) to strengthen the inclusiveness and thoroughness of reviewing the literature on EOTE.

## 4. Findings

Overall, our review has identified four levels of EOTE interventions (i.e., programmatic, curricular, pedagogical, and activity) and their respective effects on nine types of subtle changes nested in three general dimensions (i.e., disposition, knowledge, and performance) related to PSTs' professional competencies for equity-oriented teaching. Fig. 2 provides a visual summary of the key findings. Aligned with the two research questions above, we first report the EOTE interventions, and then the effects of these interventions on PSTs.

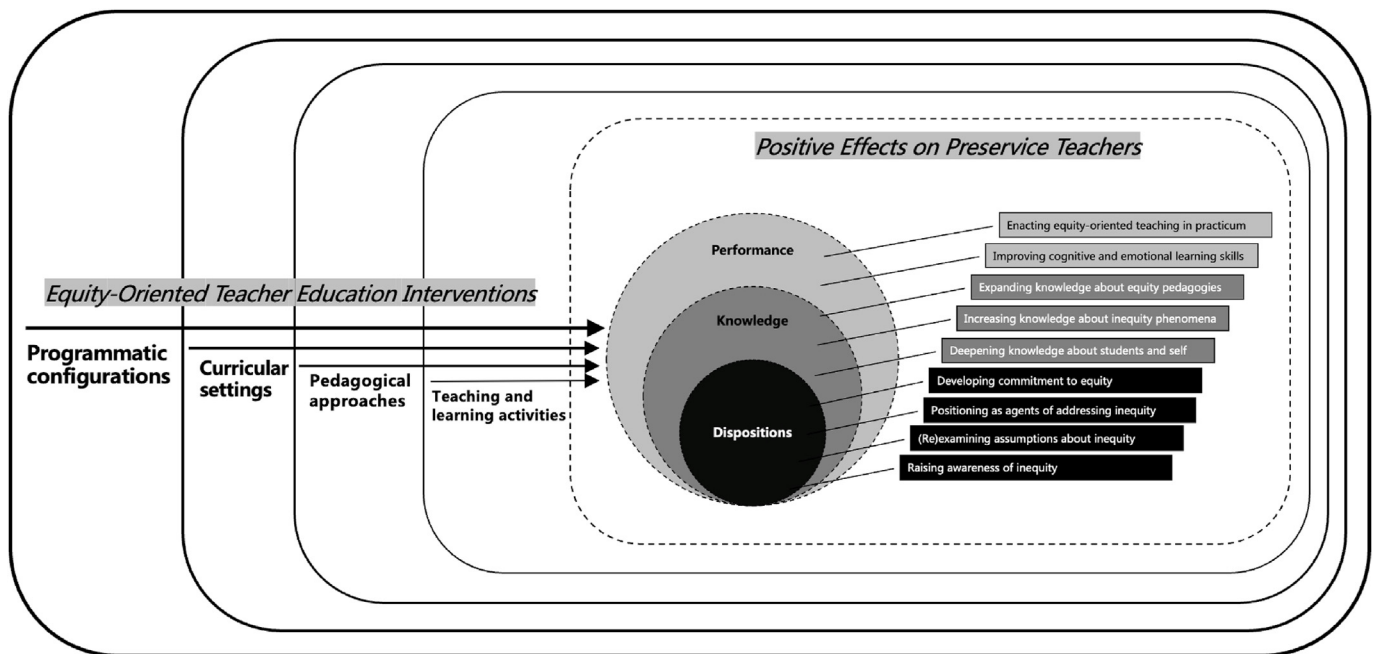
### 4.1. Equity-oriented teacher education interventions

Four levels of teacher education interventions have been identified from our inductive analysis of the selected articles (see Table 3).

The first level, namely the programmatic configurations, refers to the interventions in which equity is systematically integrated into major components of a teacher education program, such as student admission, course development, instruction, and field placement. The second level pertains to the program curricula, including both university-based courses and out-of-university field experiences. The third level focuses on pedagogical approaches that explicate general pedagogical principles, frameworks, or models that guide teacher education practices. The last level refers to the specific teaching and learning activities used in courses and other educational experiences in teacher education programs. For analytical purposes, we synthesized the rich and diverse set of EOTE interventions into these four categories. But in reality, these EOTE interventions must intricately interconnect and interplay with each other, and teacher education programs use them in different combinations to advance PSTs' learning to become equity-oriented educators in their situated contexts.

**Table 3**  
Equity-oriented teacher education interventions.

Programmatic configurations	Curricular settings	Pedagogical approaches	Teaching and learning activities
<b>Advocating core values</b> <ul style="list-style-type: none"> <li>- Equity (Grudnoff et al., 2016)</li> <li>- Social justice (Newton et al., 2020; Reagan et al., 2016; Whipp, 2013)</li> <li>- Core practices for equitable instruction (Kang &amp; Zinger, 2019)</li> <li>- Education for social change (Baily et al., 2014)</li> </ul> <b>Enhancing curricular coherence</b> <ul style="list-style-type: none"> <li>- Horizontal coherence (Kang &amp; Zinger, 2019)</li> <li>- Vertical coherence (Whipp, 2013)</li> </ul> <b>Fostering supportive environments</b> <ul style="list-style-type: none"> <li>- Adequate length of interventions (e.g., Baily et al.)</li> <li>- Diversified spaces (e.g., Newton et al., 2020)</li> <li>- Securing financial support (Reagan et al., 2016)</li> <li>- Developing teacher educators (e.g., Baily et al.)</li> </ul>	<b>University courses</b> <ul style="list-style-type: none"> <li>- Lectures or seminars including reading, writing, discussion and reflection (Broderick &amp; Lalvani, 2017; Ellis et al., 2016; Lemley, 2014; Riley et al., 2019)</li> <li>- Courses featuring inquiry or in-depth study (Nowell &amp; Poindexter, 2019)</li> <li>- Courses with experiential learning activities (Kang &amp; Martin, 2018; Stanton &amp; Gonzalez, 2011)</li> </ul> <b>Field experiences</b> <ul style="list-style-type: none"> <li>- Short-term service learning or internships in one location (Bleicher, 2011; Dyce &amp; Owusu-Ansah, 2016; Liu et al., 2020; Nichols &amp; Sullivan, 2016; Tinkler &amp; Tinkler, 2016)</li> <li>- Long-term service learning or practicum in one location (Iyer et al., 2018; Lund &amp; Lee, 2015; Tinkler et al., 2019)</li> <li>- Learning across diverse fields (Anderson &amp; Stillman, 2011; Nguyen &amp; Zeichner, 2021; Petersen &amp; Henning, 2018; Rahatzad et al., 2013; Ritchie et al., 2013; Sharma et al., 2013)</li> </ul>	<ul style="list-style-type: none"> <li>- Inclusive pedagogy (Thompson, 2012)</li> <li>- Pedagogy of discomfort (Ohito, 2016; Shelley &amp; McCuaig, 2018)</li> <li>- Social justice-based critical pedagogy (Helmer, 2014)</li> <li>- Participatory action research pedagogy (Anderson et al., 2015)</li> <li>- Testimonio pedagogy (Sosa-Provencio et al., 2019)</li> <li>- Arts-based pedagogy (Shelley &amp; McCuaig, 2018)</li> <li>- Compassionate, critical, justice-oriented pedagogy (Conklin &amp; Hughes, 2016)</li> <li>- Critical and dialogical pedagogy (Convertino, 2016)</li> <li>- Personal reflection pedagogy (Shelley &amp; McCuaig, 2018)</li> <li>- UDL framework and DSME principles for SEN students (Tan &amp; Padilla, 2019)</li> <li>- RSIS model for LGBTQ students (Payne &amp; Smith, 2012)</li> </ul>	<b>Teaching activities</b> <ul style="list-style-type: none"> <li>- Co-teaching (Cobb &amp; Sharma, 2015)</li> <li>- Explicit modeling (Acquah &amp; Szelei, 2020)</li> <li>- Visual pedagogical strategies (White &amp; Murray, 2016)</li> </ul> <b>Learning activities</b> <ul style="list-style-type: none"> <li>- Student inquiries on a given theme (Byker &amp; Marquardt, 2016; Chong et al., 2020; Christopher &amp; Taylor, 2011; Hennig et al., 2020; Howard &amp; Ticknor, 2019; Kraehe &amp; Brown, 2011; Nganga, 2019)</li> <li>- Story-telling, dialogues and meetings (Baloch, 2014; Gachago et al., 2014; Solic &amp; Riley, 2019; Tinkler &amp; Tinkler, 2016)</li> <li>- Designing and practicing teaching (Hubbard &amp; Swain, 2017; Knif &amp; Kairavuori, 2020)</li> <li>- Autobiography (Boyd &amp; Noblit, 2015)</li> <li>- Equity audit (Dodman et al., 2019)</li> <li>- Digital vignettes (Max, 2017)</li> <li>- Daybooks (Lillge &amp; Knowles, 2020)</li> </ul>



**Fig. 2.** A conceptualization of EOTE interventions and their effects on PSTs.

#### 4.1.1. Programmatic configurations

As displayed in Table 3, we identified three specific programmatic interventions in six studies (i.e., Baily et al., 2014; Grudnoff et al., 2016; Kang & Zinger, 2019; Newton et al., 2020; Reagan et al., 2016; Whipp, 2013), including advocating core values, enhancing curricular coherence, and fostering supportive environments.

The first programmatic intervention was to explicitly state and advocate equity-related core values. The programs in the related studies brought up several core values, including “Equity”

(Grudnoff et al., 2016), “Social Justice” (Newton et al., 2020; Reagan et al., 2016; Whipp, 2013), “Core Practices for Equitable Instruction” (Kang & Zinger, 2019), and “Education for Social Change” (Baily et al., 2014), to guide their teacher education practices at the programmatic scale. For instance, Reagan et al. (2016) reported how the Urban Teacher Residency Program at a research-intensive university in the United States adopted “Social Justice” as the program’s core value. The program explicitly aimed to prepare teachers “to actively challenge the many sociocultural, institutional, bureaucratic, and interpersonal ways in which children and their

families experience marginalization and exclusion in schools" (Reagan et al., 2016, p. 215). By naming and stating the core values, these programs formed a vision of teacher education to guide the practices and interactions among PSTs, teacher educators, administrators, and other stakeholders.

The second program-level intervention was to enhance curricular coherence across different curricular components, such as on-campus coursework, service learning, and teaching practicum. Two programs (i.e., Kang & Zinger, 2019; Whipp, 2013) explicitly adopted this intervention. Kang and Zinger (2019) reported on how a master's level teacher education program in the United States enhanced the program curriculum's horizontal coherence, which means that two or more courses parallelly held (e.g., in the same semester) are inherently consistent and mutually reinforcing. In this program, the PSTs' year-long field teaching was coupled with a fieldwork seminar that addressed common teaching issues and a science methods course that promoted four core practices of Ambitious Science Teaching (AST). Guided by this framework, PSTs exercised the "planning-practicing-reflecting-revising" cycles in their teaching and brought student work samples to this course for instructor and peer feedback. In the meantime, reflective notes and teaching reports were assigned to them as a means of evaluation. In this way, PSTs moved back and forth between the targeted value and complex realities and cultivated critical habits of mind for long-term inquiries.

Relatedly, Whipp (2013) described how another program at a mid-sized Catholic university in the United States enhanced the curriculum's vertical coherence. We use vertical coherence to refer to a series of interconnected courses over time (e.g., different semesters) that can advance gradual progress towards the program's core values and goals. In this program, early foundational courses such as "Teaching in a Diverse Society" introduced reading materials to help PSTs interrogate their initial understandings of equity-related issues while following methods courses supported their practice of culturally responsive and critical pedagogies. More importantly, the extent of PSTs' exposure to practice also increased from after-school tutoring, early experiences in urban churches, guided teaching to full-semester practicum. Across the curriculum, PSTs had continuous debates on policy issues and structural inequity in connection with their reading, writing, and firsthand knowledge. In brief, this program's theoretical inputs, guided deliberation in practice, and follow-up coursework such as ongoing reflection were organically interconnected, which constituted a coherent curriculum for fostering equity-oriented teaching.

The third intervention was to foster programmatic learning environments that could support PSTs' deep and intensive engagement with equity-oriented teaching. Such an effort involved program-wide arrangements of time, space, financing, and teacher educators. The six programs mentioned above provided one to two years of equity-focused curricular interventions, which guaranteed sufficient time and opportunities for PSTs to approximate equity-oriented teaching practices. In terms of space, all the programs established partnerships with local schools, communities, and social institutions for PSTs to engage with educational realities in diverse settings. The program reported in Newton et al.'s (2020) study even extended the PSTs' space for learning beyond national borders through a study-abroad program to develop PSTs' global competency to serve diverse students. Securing sufficient financial support was also crucial. The program reported in Regan et al.'s (2016) study actively sought governmental grants to enhance financial support for the EOTE efforts, but such an effort was barely reported in other studies. Furthermore, teacher educators in several programs also strived to create a safe and caring environment for PSTs to voice freely and inquire with scaffoldings and modeled equity-oriented teaching methods in their own classrooms. Some

programs also provided resources and activities to advance teacher educators' awareness of and capacity to support PSTs to pursue equity-oriented teaching (Baily et al., 2014; Kang & Zinger, 2019).

#### 4.1.2. Curricular settings

Instead of structuring the whole program to be centered around equity, the second level of EOTE interventions as identified in 21 studies (e.g., Broderick & Lalvani, 2017; Nguyen & Zeichner, 2021; Sharma et al., 2013) focused on the "meat" of teacher education programs—curriculum. We use curriculum here to refer to both university-based courses and field experiences that take place in various settings.

University-based courses were used as a main site of curriculum-level EOTE interventions. Many teacher educators in universities consciously incorporated equity-related themes in classroom discussions, recommended literature, writing assignments, workshop activities and student tutorials to advance the progression of PSTs' understanding of core concepts related to educational and social equity (Broderick & Lalvani, 2017; Ellis et al., 2016; Lemley, 2014; Riley et al., 2019). Other courses were organized in a more proactive manner, as PSTs engaged with inquiries or in-depth analysis of certain subject matters, such as Holocaust, tasked with writing and rewriting lesson plans for the enactment of equity-oriented teaching in their future classrooms (Nowell & Poindexter, 2019). Some course instructors even chose to set their courses in theatres, where the real-life connecting course settings enabled PSTs to learn about multiculturalism and history in a more intimate way (Stanton & Gonzalez, 2011).

Several out-of-university fields were used as additional sites of curriculum enactments to help PSTs understand inequity issues in practical contexts. For instance, some teacher education programs assigned PSTs to teach in schools with different socio-economic backgrounds or racial makeups in their local communities (Anderson & Stillman, 2011; Nguyen & Zeichner, 2021; Ritchie et al., 2013). Other programs provided PSTs with the opportunity to teach overseas (Sharma et al., 2013). Despite the usefulness of direct exposure to educational and social realities, theoretical guidance and support from university-based teacher educators were considered indispensable to help PSTs make meanings of, reflect on, and develop actions towards the equity-related phenomena they observed in field experiences.

The lengths of field-based curricular experiences also varied, ranging from 10 hours of academic tutorial to weekly service learning that could last a whole school year. While short-term (less than a month) on-the-spot learning rewarded PSTs with firsthand knowledge of the challenging conditions facing disadvantaged students (Liu et al., 2020; Tinkler et al., 2019), longer arrangements could enable PSTs to investigate (in)equity-related phenomena in greater detail and depth (Iyer et al., 2018).

#### 4.1.3. Pedagogical approaches

We identified another bulk of EOTE interventions in ten studies (e.g., Ohito, 2016; Shelley & McCuaig, 2018; Thompson, 2012) that operationalized at the level of pedagogical approaches which refer to general teaching frameworks, principles, or models applied by teacher educators to prepare equity-oriented teachers.

A wide range of equity-oriented pedagogical approaches with differing names has emerged from the reviewed studies. These included inclusive pedagogy (Thompson, 2012); pedagogy of discomfort (Ohito, 2016; Shelley & McCuaig, 2018); social justice-based critical pedagogy (Helmer, 2014); testimonio pedagogy (Sosa-Provencio et al., 2019); arts-based pedagogy (Shelley & McCuaig, 2018); participatory action research pedagogy (Anderson & Stillman, 2011); compassionate, critical, justice-oriented pedagogy (Conklin & Hughes, 2016); critical and

dialogical pedagogy (Convertino, 2016); personal reflection pedagogy (Shelley & McCuaig, 2018); Universal Design for Learning (UDL) framework and Disability Studies in Mathematics Education (DSME); principles to serve Special Educational Needs (SEN) (Tan & Padilla, 2019); and Reduction of Stigma in Schools (RSIS) (Payne & Smith, 2012).

These pedagogical approaches took slightly different conceptual and pragmatic underpinnings regarding equity issues and presented different foci on teacher education practices. Some of these approaches highlighted the role of critical reflection and assumed that it was pivotal to create safe, supportive, and stimulating environments for PSTs to critically reflect and act on their pre-existing assumptions about teaching, education, and society. The pedagogy of discomfort, for instance, required learners to step out of their comfortable zone, investigate their emotions, and question their hegemonic beliefs and habitual practices (Ohito, 2016). Likewise, the inclusive pedagogy would purposively and educationally disrupt PSTs' individualized, medical views of disability and encourage them to explore alternative enabling, socially just views and practices (Thompson, 2012). Similar pedagogical logics were also reflected in the other pedagogical models mentioned above.

Some other approaches were set to engage PSTs in research practices, such as participatory action research informed pedagogy (Anderson et al., 2015) and Testimonio narrative pedagogy (Sosa-Provencio et al., 2019) as they posited research as a driving force of PSTs' equity-oriented learning and growth. Drawing on Grossman, Hammerness, and McDonald's (2009) core practices of professional education, Conklin and Hughes (2016) delineated a compassionate, critical, justice-oriented pedagogy that consisted of three key steps: representation of multimedia sources, decomposition of teaching strategies, and approximation of equitable practices. Still others were focused on particular groups of disadvantaged students, such as students with special needs and sexual-minority students (Payne & Smith, 2012; Tan & Padilla, 2009).

#### 4.1.4. Teaching and learning activities

The fourth level of EOTE interventions was at the activity level. These interventions, as identified in 20 studies (e.g., Acquah & Szelei, 2020; Byker & Marquardt, 2016; Riley & Solic, 2017), were relatively microscopic compared to the previous ones. However, they offered specific, concrete, and hands-on teaching and learning tasks, assignments, and tools for preparing equity-oriented teachers.

On the teaching side, three activities were identified, namely the co-teaching (Cobb & Sharma, 2015), explicit modeling (Acquah & Szelei, 2020), and visual pedagogical strategies (White & Murray, 2016). Cobb and Sharma (2015) found that co-teaching was an effective activity in facilitating teacher educators' mutual collaboration, support, and improvement for enacting equity-oriented teacher education practices. Acquah and Szelei's (2020) study found that explicit modeling, as embodied in combinational uses of ten specific classroom activities, exerted positive impact on PSTs' learning of equity-oriented pedagogies. Further, a set of visual pedagogical strategies including narratives, reading visual texts and photographing performances were found to be helpful for deepening PSTs' understandings of equity-related issues (White & Murray, 2016). Similarly, Nganga's (2019) study highlighted the affective aspect of role-play and mock trials and proved the effectiveness of these teaching activities, supplemented with the uses of literature, multimedia resources and classroom discussion, in preparing equity-oriented teachers.

Meanwhile, a series of learning activities were also identified to be effective in enhancing PSTs' awareness of and capacity for prompting equity. These included student inquiries on equity-

related topics (e.g., Byker & Marquardt, 2016); story-telling, dialogues and meetings (e.g., Solic & Riley, 2019); designing and practicing teaching (Hubbard & Swain, 2017; Knif & Kairavuori, 2020); autobiography (Boyd & Noblit, 2015); equity audit (Dodman et al., 2019); digital vignettes (Max, 2017); and daybooks (Lillge & Knowles, 2020). Some studies (e.g., Byker & Marquardt, 2016; Christopher & Taylor, 2011) stressed the importance of learning through inquiring, in collaboration, and by practicing in teacher education and found that individual or group inquiries within and beyond universities could engage PSTs in closer examinations of equity-related topics such as race or global citizenship (Byker & Marquardt, 2016; Chong et al., 2020; Christopher & Taylor, 2011; Hennig et al., 2020; Kraehe & Brown, 2011).

Other studies (e.g., Riley & Solic, 2017; Solic & Riley, 2019; Tinkler & Tinkler, 2016) found that opportunities for initiating dialogues with students, peers and activist teachers through service learning, professional conferences or meetings, could create valuable spaces for exchanging, broadening, and developing PSTs' educational perspectives. For instance, Knif and Kairavuori's (2020) study reported how an equity-focused workshop scaffolded PSTs to design and enact a lesson to promote equity in art classroom settings. Hubbard and Swain (2017) examined how a similar learning activity surrounding the Civil Rights Movement advanced the participating PSTs' equity-oriented learning and development.

A prominent feature of these learning activities was the various forms of presentation or carriers of assigned topics. Oral text such as collaborative story-telling (Baloche, 2014), visual text such as photography (White & Murray, 2016), written text such as autobiography (Boyd & Noblit, 2015), and other kinds of digital texts (e.g., Max, 2017) were collected, generated and criticized to evoke deeper reflection and dialogues among various stakeholders of teaching and teacher education. As empowered by multi-media technologies, several learning tools such as Daybooks (Lillge & Knowles, 2020) and equity audit (Dodman et al., 2019) were also introduced as effective aides in PSTs' learning to become equity-oriented teachers.

Taken together, our review has identified a wide range of EOTE interventions that were respectively focused on the programmatic, curricular, pedagogical, and activity level of teacher education practices in differing socio-cultural contexts. The rich and diverse stock of EOTE interventions is a testimony of the worldwide and sustained efforts at advancing equity in teaching and teacher education over the past decade. However, it is still unclear what specific effects these EOTE interventions have actualized on PSTs. We turn to answering this research question in the next section.

#### 4.2. Effects of EOTE interventions on PSTs

All 58 studies reported positive effects of EOTE interventions on PSTs, while eight studies also identified no or negative effects as part of their research findings. Positive effects refer to the development of PSTs' dispositions, knowledge, and performance towards equity-oriented teaching. In contrast, negative effects mean PSTs' changes against equity-oriented teaching (e.g., deepened deficit views of marginalized students). Null effects mean that no apparent changes in PSTs were observed.

##### 4.2.1. Positive effects

The EOTE interventions mentioned above had brought a variety of positive effects to PSTs. Informed by the existing conceptualizations of teacher learning and development (e.g., AITSL, 2018; Boylan et al., 2018; CCSSO, 2013), we organized the effects into three general categories that respectively focus on PSTs' dispositions, knowledge, and performance. Several sub-categories within each of the three general categories have emerged from our



inductive analysis, and they represent subtle changes related to each of the three general categories. We use disposition in a broad sense to refer to PSTs' awareness, assumptions, self-positioning, and commitment relevant to equity issues. Knowledge means PSTs' understandings of their personal experiences, different contexts for teaching, and pedagogical knowledge for addressing equity issues. Performance includes both PSTs' learning performance as students in teacher education programs and their classroom teaching performance during their teaching practicum. See Table 4 for a mapping of the reviewed studies on the categories of effects and the EOTE interventions that have reportedly contributed to the effects.

**Positive Effects on PSTs' Dispositions.** The first layer of impact was on PSTs' dispositions. The reviewed studies documented four specific changes in the participating PSTs' dispositional qualities. These included: (1) raising awareness of inequity; (2) (re)examining assumptions about inequity; (3) positioning as agents of addressing inequity; (4) developing commitment to equity. These changes reflected an increasingly deep dispositional engagement with equity-related issues.

First, 13 studies reported that the EOTE interventions had helped increase the participating PSTs' awareness of the existence of educational and societal inequities that they had overlooked before. To recognize something subtle or complex, PSTs often needed to go through a process from unknowing to knowing, from vague to clear (e.g., Dodman et al., 2019; Hubbard & Swain, 2017; Baily et al., 2014). It was the first time for many PSTs to intellectually and practically engage with topics related to diversity, equity, and social justice in their teacher education programs. By engaging with those equity-focused curricular contents, the PSTs realized the fact that inequities pervasively existed in schools and society (e.g., Bleicher, 2011; Nguyen & Zeichner, 2021), which further led them to be more conscious of inequitable, unfair, and unjust phenomena.

22 studies reported PSTs critically (re)examining their pre-existing assumptions and beliefs about equity-related issues, especially about people from minority or disadvantaged backgrounds. PSTs moved from a shallow or biased understanding of inequity to deeper reflection, increased inclusivity, and growing appreciation of multicultural reality. Before the EOTE interventions, some PSTs might have developed certain awareness of inequity which contained several misunderstandings of people of minority groups (e.g., Christopher & Taylor, 2011; Dyce & Owusu-Ansah, 2016). Through practical experiences (e.g., Nguyen & Zeichner, 2021; Sharma et al., 2013) or gaining theoretical perspectives (e.g., Riley & Solic, 2017; Solic & Riley, 2019; Sosa-Provencio et al., 2019), PSTs were supported to re-examine their previously formed concepts and transformed their attitudes towards disadvantaged populations from mainly negative to positive (e.g., Chong et al., 2020; Kang & Martin, 2018). This change of attitude as reported in some studies (e.g., Liu et al., 2020; Tinkler & Tinkler, 2013) involved PSTs' reflection on their own roles or identities, as well as the relationship between themselves and others.

23 studies reported that EOTE interventions had supported PSTs to develop a self-positioning as change agents who had the responsibility to address inequity issues in schools and society. Equity-oriented teacher education programs provided PSTs with various opportunities to think about their roles and identities as teachers to enact equity-oriented teaching. The effected changes at this level included PSTs feeling the urgency to change original perceptions of their roles (Baily et al., 2014; Baloch, 2014; Tinkler & Tinkler, 2013), build equity-oriented standpoints as a future educator (Solic & Riley, 2019; Tan & Padilla, 2019), and hold multicultural and inclusive views of education (Hennig et al., 2020; Lund & Lee, 2015; Nguyen & Zeichner, 2021). In some studies (e.g., Anderson & Stillman, 2011; Hubbard & Swain, 2017; Riley et al.,

2019), EOTE interventions had increased PSTs' willingness to take actions as change agents through leading them to experience successful enactment of equity-oriented teaching and thus increased their self-efficacy. Gradually, PSTs began to treat themselves as practitioners who should assume the role of reformer or activist, and promote equity-oriented teaching in their classrooms and beyond (e.g., Nowell & Poindexter, 2019; Ritchie et al., 2013).

The fourth dispositional change was related to PSTs' commitment to promoting equity in their future teaching, which seemed to be grounded on the previous levels of changes. Seven studies documented this level of change in their participating PSTs. In particular, the PSTs demonstrated greater willingness to undertake the responsibility of an equity-oriented teacher (Reagan et al., 2016), and showed a strong desire and commitment to educational equity in their future teaching (Bleicher, 2011; Chong et al., 2020). Since these PSTs had recognized their roles as change agents, their dispositional aptitude was eventually converting into their inner motivation to help develop their agentic, progressive, and powerful expectations about their future teaching (Petersen & Henning, 2018). Despite all the difficulty and challenges that they would face, the PSTs still wanted to devote themselves to continuous learning to strengthen their equity-oriented teaching capacities (Christopher & Taylor, 2011; Gachago et al., 2014).

**Positive Effects on PSTs' Knowledge.** The second type of effects was on PSTs' knowledge. Three specific changes regarding the participating PSTs' knowledge have been identified, including PSTs' deepened understandings about students and themselves, increased knowledge about the educational and socio-cultural contexts for teaching, and expanded knowledge about equity-oriented pedagogies.

First, 12 studies reported that under the influences of EOTE interventions, the PSTs realized the importance of knowing their students' diverse backgrounds and characteristics in promoting equity in teaching and education (Bleicher, 2011; Kang & Martin, 2018; Tan & Padilla, 2019; Tinkler & Tinkler, 2013). In some studies (e.g., Acquah & Szelei, 2020; Gachago et al., 2014; Payne & Smith, 2012), the PSTs re-examined their previously formed knowledge about their students, especially those from marginalized groups. They recognized the implicitly biased, stereotypical, and deficit views and felt an urgency to adjust or even reconstruct their knowledge about their students from traditionally oppressed populations. By critically examining and extending their understanding of their students and themselves, the PSTs constructed trustful views of student-teacher relationships. Such an understanding served as a foundational knowledge base for them to optimize their future teaching practices and fulfill their duties as equity-promoting teachers (Conklin & Hughes, 2016; Tinkler et al., 2019; Tinkler & Tinkler, 2016).

Second, 25 studies found that the PSTs had increased their knowledge about equity-related phenomena. In some studies, the PSTs broadened their understandings of several key terms that were commonly used to describe the phenomena, such as equity (Cobb & Sharma, 2015; Knif & Kairavuori, 2020), multicultural awareness (Stanton & Gonzalez, 2011), and social and ecological justice (e.g., Anderson et al., 2015; Christopher & Taylor, 2011; Newton et al., 2020; Nganga, 2019). Other studies (e.g., Boyd & Noblit, 2015; Chong et al., 2020; Kraehe & Brown, 2011; Newton et al., 2020; Solic & Riley, 2019) reported how EOTE interventions enriched PSTs' perspectives of viewing specific issues on race, class, gender, and other related topics. As Ritchie et al. (2013) described, PSTs gained new critical perspectives, which they hoped to implement in their classrooms one day. Further, PSTs in a few other studies (e.g., Nowell & Poindexter, 2019; Rahatzad et al., 2013; Sharma et al., 2013) reported that engaging with issues such as neoliberal networks, colonial social relations, and holocaust affairs

**Table 4**

Cross-tabulation of the EOTE interventions and their positive effects on PSTs.

Level of interventions	Dispositions				Knowledge			Performance	
	Raising awareness of inequity	(Re)examining assumptions about inequity	Positioning as agents of addressing inequity	Developing commitment to equity	Deepening knowledge about students and themselves	Increasing knowledge about equity-related phenomena	Expanding knowledge about equity-oriented pedagogies	Improving cognitive and emotional learning skills	Enacting equity-oriented teaching in practicum
<b>Programmatic configurations</b>	2 (Baily et al.; Kang & Zinger)	1 (Reagan et al.)	2 (Baily et al.; Grudnoff et al.)	1 (Reagan et al.)	1 (Grudnoff et al.)	3 (Baily et al.; Newton et al.; Reagan et al.)	1 (Grudnoff et al.)	4 (Baily et al.; Grudnoff et al.; Reagan et al.; Newton et al.)	3 (Baily et al.; Kang & Zinger; Whipp)
<b>Curricular settings</b>	5 (Bleicher; Stanton & Gonzalez; Ellis et al.; Iyer et al.; Nguyen & Zeichner)	11 (Broderick & Lalvani; Christopher & Taylor; Dyce et al.; Kang & Martin; Liu et al.; Nguyen & Zeichner; Rahatzad et al.; Riley et al.; Sharma et al.; Tinkler & Tinkler; Tinkler et al.)	10 (Anderson & Stillman; Bleicher; Ellis et al.; Lund & Lee; Nguyen & Zeichner; Nowell & Poindexter; Petersen & Henning; Riley et al.; Ritchie et al.; Tinkler & Tinkler)	3 (Bleicher; Christopher & Taylor; Petersen & Henning)	5 (Bleicher; Kang & Martin; Nichols & Sullivan; Tinkler & Tinkler; Tinkler et al.)	9 (Bleicher; Christopher & Taylor; Liu et al.; Nowell & Poindexter; Rahatzad et al.; Ritchie et al.; Sharma et al.; Stanton & Gonzalez; Tinkler et al.)	4 (Lund & Lee; Nguyen & Zeichner; Nowell & Poindexter; Tinkler et al.)	4 (Iyer et al.; Liu et al.; Sharma et al.; Stanton & Gonzalez)	9 (Anderson & Stillman; Christopher & Taylor; Dyce et al.; Ellis et al.; Lemley; Lund & Lee; Nowell & Poindexter; Ritchie et al.; Tinkler et al.)
<b>Pedagogical approaches</b>	2 (Payne & Smith; Thompson)	5 (Conklin & Hughes; Helmer; Shelley & McCuaig; Sosa-Provencio et al.; Tan & Padilla)	1 (Tan & Padilla)	n/a	3 (Conklin & Hughes; Payne & Smith; Tan & Padilla)	2 (Anderson et al.; Convertino)	2 (Payne & Smith; Thompson)	2 (Anderson et al.; Sosa-Provencio et al.)	1 (Tan & Padilla)
<b>Teaching and learning activities</b>	4 (Boyd & Noblit; Dodman et al.; Gachago et al.; Max)	5 (Chong et al.; Lillge & Knowles; Nganga; Riley & Solic; Solic & Riley)	10 (Acquah & Szelei; Baloch; Boyd & Noblit; Dodman et al.; Gachago et al.; Hennig et al.; Hubbard & Swain; Kraehe & Brown; Riley & Solic; Solic & Riley)	3 (Chong et al.; Gachago et al.; Hennig et al.)	3 (Acquah & Szelei; Gachago et al.; Tinkler & Tinkler)	11 (Acquah & Szelei; Boyd & Noblit; Byker & Marquardt; Chong et al.; Cobb & Sharma; Hubbard & Swain; Knif et al.; Kraehe & Brown; Lillge & Knowles; Nganga; Solic & Riley)	5 (Hennig et al.; Howard & Ticknor; Knif et al.; Lillge & Knowles; Max)	9 (Acquah & Szelei; Boyd & Noblit; Byker & Marquardt; Gachago et al.; Hennig et al.; Kraehe & Brown; Lillge & Knowles; Nganga; Solic & Riley)	2 (Hubbard & Swain; Knif et al.)

Note. The number in each cell is the count of studies falling in this category. To save space, we did not include the studies' years of publication, and this information can be found in the reference list.

had led them to be suspicious about the origins and outcomes of unjust social phenomena. The PSTs reflected on the intricate social relations behind the phenomena with a historical and global lens to recognize how the larger social structures had restrained disadvantaged groups of people. Still, other studies (e.g., Baily et al., 2014; Convertino, 2016) investigated how EOTE interventions shaped PSTs' knowledge of inequity in schools. The studies identified PSTs' progressive understanding of how knowledge was socially constructed and how power relationships shaped views and decision-making in education. This kind of new knowledge helped PSTs raise critical awareness and appreciation of different cultures.

Third, 12 studies found that the PSTs expanded their knowledge about equity-oriented pedagogies. For instance, in some studies (e.g., Grudnoff et al., 2016; Lund & Lee, 2015; Tinkler et al., 2019), PSTs gained practical knowledge about how to create a safe and inclusive environment for marginalized students, such as the disabled (Thompson, 2012) or those from LGBTQ groups (Payne & Smith, 2012). For example, Max's (2017) study reported preservice secondary mathematics teachers' growing pedagogical knowledge about enabling students to verbalize mathematical language. This finding signified a switch of these PSTs' pedagogical and cognitive focus from learning outcomes to learning processes, from a teacher-centered to a more learner-centered approach. Moreover, Nowell and Poindexter's (2019) study identified increased pedagogical knowledge in participating PSTs through a Holocaust education curriculum. Payne and Smith's (2012) and Max's (2017) studies reported PSTs' increased knowledge about the importance of instructional languages and how they shaped students' learning experiences and outcomes.

**Positive Effects on PSTs' Performance.** The third effect of EOTE interventions was the changes in PSTs' performance, including their performance as learners in teacher preparation programs and as classroom teachers during their teaching practicum. Since many studies provided EOTE interventions at the curricular and activity level, the PSTs got limited chances to experiment with the ideas and strategies of equity-oriented teaching. Therefore, the effect at the performance level was not as apparent as it was on dispositions or knowledge. Nevertheless, a few studies still have documented changes in PSTs' learning and teaching performance resulting from EOTE interventions.

The direct effect of EOTE interventions on performance was PSTs having improved their learning skills, as documented in 19 studies (e.g., Anderson & Stillman, 2011; Baily et al., 2014; Kraehe & Brown, 2011; Stanton & Gonzalez, 2011). In particular, PSTs gained useful cognitive and emotional engagement skills and upgraded their learning methods to facilitate equity-oriented study in teacher education courses. As shaped by the equity-oriented curriculum and instruction, the PSTs discussed equity-related issues in and out of classroom (Liu et al., 2020; Newton et al., 2020), their awareness of personal transformation (Baily et al., 2014; Sharma et al., 2013) and equitable ways to recreate the future class and the world (e.g., Acquah & Szelei, 2020; Grudnoff et al., 2016; Kraehe & Brown, 2011). Reagan et al. (2016) noticed PSTs' shift to equity-oriented discourses in university courses. PSTs also related their course learning to former experiences, such as their family history or prior knowledge, to explore, analyze and evaluate evidence about inequity with more critical eyes (Boyd & Noblit, 2015; Nganga, 2019; Sosa-Provencio et al., 2019; Stanton & Gonzalez, 2011). In particular, PSTs tended to be emotionally involved when they recalled former experiences (e.g., Anderson et al., 2015; Hennig et al., 2020), thus eliciting respect and empathy for students in all conditions (Gachago et al., 2014). Moreover, PSTs connected their learning experiences to their future teaching practice (Byker & Marquardt, 2016; Thompson, 2012). For example, Acquah and Szelei (2020)

claimed that equity-oriented teaching activities could help PSTs develop principles, attitudes and behaviors for future practice, while Lillge and Knowles (2020) made use of Daybook to inspire them to conduct instructional experimentation.

The most desirable effect of EOTE would be PSTs enacting equity-oriented pedagogies in practice because it is a teacher's classroom teaching performance that directly and powerfully shapes students' learning. 15 studies we reviewed (e.g., Anderson & Stillman, 2011; Hubbard & Swain, 2017; Tan & Padilla, 2019; Whipp, 2013) reported PSTs trying out equity-oriented pedagogies during their student teaching practices. Some studies (e.g., Dyce & Owusu-Ansah, 2016; Helmer, 2014; Knif & Kairavouri, 2020) found that PSTs focused on the relationship between knowledge and power in their student teaching, which indicated a translation of equity-oriented knowledge they gained from teacher education courses into their teaching practices. Still others (e.g., Ellis et al., 2016; Nowell & Poindexter, 2019; Tan & Padilla, 2019) found that the participating PSTs emphasized students' different needs, preferences, and backgrounds. The PSTs also attempted to locate where they could effect change (Baily et al., 2014), discover the merit of interaction and dialogue (Kang & Zinger, 2019; Knif & Kairavouri, 2020), and adjust their teaching strategies to cater to students' differing learning needs.

#### 4.2.2. Negative and null effects

Eight studies reported negative or null effects of EOTE interventions on PSTs (Anderson & Stillman, 2011; Bleicher, 2011; Gachago et al., 2014; Hubbard & Swain, 2017; Kang & Zinger, 2019; Kraehe & Brown, 2011; Petersen & Henning, 2018; Tinkler & Tinkler, 2013). First, PSTs in some of these studies (e.g., Anderson & Stillman, 2011; Bleicher, 2011; Gachago et al., 2014; Kraehe & Brown, 2011) experienced negative feelings, such as worry, stress, and discomfort that might have further led to their dispositional resistance to equity-oriented teaching. For instance, in Kraehe and Brown's (2011) study on using arts-based inquiries to awaken PSTs' capacities for equity, the authors noted that this EOTE intervention "does invoke anxiety, fear, and a sense of danger in students, as the aesthetic can (and very often seeks to) disrupt normalized ways of thinking about self and the world" (p. 507).

Second, in some other studies (Hubbard & Swain, 2017; Tinkler & Tinkler, 2013), the EOTE interventions unintentionally fostered PSTs' deficit perceptions of minority students and their parents. For instance, Tinkler and Tinkler (2013) examined the impact of a service-learning on PSTs' perceptions of diversity. 38% of the 37 PSTs in this study "made statements that were coded as reflective of a deficit perspective" (p. 54), mainly resulting from the PSTs' lacking of multicultural experiences, critical thinking abilities, or subject matter knowledge.

Third, two studies (i.e., Kang & Zinger, 2019; Petersen & Henning, 2018) identified no significant effect of the investigated EOTE interventions on PSTs' actual engagement with equity-oriented teaching practices. Petersen and Henning (2018) examined how a service-learning experience shaped the PSTs' practice of social justice and care. They concluded, "We feel we had less success, however, with helping students become fully enculturated into the discourse community of caring, social justice-oriented education" (p. 10), indicating that translating the ideas of equity-oriented teaching into practice was an uneasy and long-term process. Similarly, Kang and Zinger's (2019) study identified the affordance of using the core practices for equitable instruction to help PSTs problematize their normalized views, expectations, and practices of teaching sciences, but the authors also admitted the limitation of such an EOTE intervention in affecting PSTs' interactions with racially marginalized students in classrooms because the program lacked coherent and sustained EOTE

curricular interventions to scaffold the PSTs to become competent in enacting equitable instruction over a sufficient period of time.

## 5. Discussion and implications for future research

Drawing on 58 rigorously selected studies that empirically examined EOTE interventions' effects on PSTs in a wide range of national and cross-national contexts over the past decade, we identified programmatic, curricular, pedagogical, and activity interventions for preparing equity-oriented teachers. These interventions have impacted the dispositional, cognitive, and performative aspects of PSTs in different directions and to different extents. These review results have the potential to make conceptual and practical contributions to the field of teacher education.

First, the review results add to the literature a conceptual framework for understanding and analyzing the relationships between EOTE interventions and PSTs' changes. The framework consists of two dimensions: the four scales of EOTE interventions (programmatic, curricular, pedagogical, and activity) and the three types of effects (disposition, knowledge, and performance). Regarding EOTE interventions, many previous studies (Boyd & Noblit, 2015; Broderick & Lavani, 2017; Conklin & Hughes, 2016; Newton et al., 2020) discretely reported on one or a few kinds of interventions for preparing equity-oriented teachers. Some existing reviews of studies on EOTE structured the interventions into several types according to the interventions' theoretical foundations (e.g., multiculturalism, critical theory, care theory), emergent themes, or analytical foci (e.g., on race, gender, social class) (Fylkesnes, 2018; Mills & Ballantyne, 2016). This review contributes a different conceptualization of EOTE interventions from the perspective of scale—at which range of operation the intervention works. As visually illustrated in Fig. 2, the scale-style conceptualization highlights that the teacher education practice is a systematic endeavor that comprises multiple layers of parts and actions (Cochran-Smith & Villegas, 2015; Kohli et al., 2022). Such a conceptualization can help situate specific interventions in a system of practice, broaden the views of understanding EOTE practices, and inform different stakeholders of teacher education (e.g., preservice teachers, teacher educators, program developers) to be conscious of their roles in the “big picture” and work collaboratively, synergistically, and systematically to improve EOTE practices.

As for the effect dimension, our inductive analysis has revealed nine positive changes related to PSTs' dispositions, knowledge, and performance. The three general categories of the effects are aligned with the mainstream constructs of teachers' professional competencies in the existing literature (e.g., AITSL, 2018; Boylan et al., 2018; CCSSO, 2013; Korthagen, 2017), which makes the taxonomy of the effects communicable and comparable with the existing understandings of the effects of teacher education programs in general. Within each of the three general categories, the review has identified more nuanced, incremental changes in PSTs specifically for equity-oriented teaching. This finding challenges the view that treats the learning to become an equity-oriented teacher as a once-and-for-all event that can easily and quickly occur. Instead, it rings the old “truth” that becoming a kind of teacher, including those who care about, advocate, and actively enhance equity, is a complex and challenging process and involves incremental and multiple layers of changes over time (Taylor, 2020).

The four levels of EOTE interventions and the nine kinds of positive changes in PSTs (as nested in three general categories) together form a framework for understanding and analyzing EOTE practices. This framework covers the primary EOTE interventions that are being widely practiced in many countries. It also specifies the series of positive changes that PSTs should and are able to make

for becoming equity-oriented teachers. Future studies can use this framework as a conceptual reference to further explore the relationships between EOTE interventions and PSTs' changes.

Second, the review results can be practically useful to teacher education program administrators, teacher educators, and teachers who value and pursue equity in their professional work. For the administrators of teacher education programs, the four scales of equity-oriented interventions with dozens of specific measures can serve as a practical reference for configuring, operating, and reforming programs for preparing equity-oriented teachers. Based on the missions, conditions, and reformative directions of a teacher education program, the administrators could use the various levels and kinds of interventions in combination to prepare their students to advance equity in their future teaching. Likewise, teacher educators in different contexts could draw on the identified interventions to inform their practices in multiple ways. These would include affirming and refining their existing practices, experimenting with new measures, crafting locally responsive measures, and comparing the effects of different measures on PSTs.

Furthermore, the three main types of effects (i.e., dispositional change, knowledge development, performance improvement) and the sub-categories (e.g., raising awareness of inequity; deepening knowledge about students and themselves; enacting equity-oriented teaching in practicum) represent the major qualities that an equity-oriented teacher should possess. The associations between the EOTE interventions and the changes of PSTs as reported in the studies reviewed also suggest the learning opportunities, resources, and experiences needed to foster the development of such qualities. Therefore, preservice and in-service teachers can use these empirical findings to guide their learning to become equity-oriented teachers in their situated contexts.

It is worth noting that a small number of studies reported no or even negative effects on PSTs. This finding confirms Reagan and Hambacher's (2021) observation that EOTE interventions are anticipated to cause emotional ambivalence in PSTs, given the critical and transformative natures of the interventions. They also point out that emotions are integral to the learning to teach for equity and social justice. A series of personal (e.g., lack of exposure to diversity in early life experiences), curricular (e.g., short-term and compartmentalized fashion of course arrangements), and programmatic (e.g., insufficient guidance and support) factors jointly contributed to the negative or no effects of EOTE interventions on PSTs (Kang & Zinger, 2019; Kraehe & Brown, 2011; Tinkler & Tinkler, 2013). Informed by this finding, teacher education programs should take active measures to support PSTs' learning to teach for equity. These include providing organically interconnected courses on equity-oriented teaching, adopting effective pedagogical approaches and methods (e.g., narrative inquiry, guided reflection) to turn PSTs' emotions into commitment and actions towards equity-oriented teaching, and offering timely and tailored guidance to PSTs, such as teacher educators modeling equity-oriented teaching in their own classrooms (Gachago et al., 2014; Kraehe & Brown, 2011; Liao, 2020; Reagan & Hambacher, 2021; Tinkler & Tinkler, 2013).

Third, through our critical readings of the review results and critical reflection of this review itself, we have identified several contested issues in the existing scholarships on EOTE. These issues also suggest several needed lines of inquiries for future research. First of all, a serious challenge we experienced was how to evaluate the extent of effect(s) that the examined EOTE intervention(s) had left on the participating PSTs. This challenge partly resulted from the fact that the predominant research methodologies used by the reviewed studies were qualitatively oriented (Mills & Ballantyne, 2016). While we agree that equity is and should be understood qualitatively and contextually (Kaur, 2012), the lack of a relatively



consensual measurement of PSTs' equity-related competencies has limited our understanding of EOTE programs' impact on PSTs, especially in a quantitative, large-scale, and cross-contextual sense (Sleeter, 2014). Recently, the National Academies of Sciences, Engineering, and Medicine (2019) in the United States has proposed a system of 16 quantitative indicators for monitoring educational equity, including the ones about students' academic readiness, on-time graduation, and access to effective teaching. This work, along with an emerging line of quantitative studies on equity-oriented teaching and teacher education (e.g., Bell & Coddling, 2021; Kim & Lee, 2020), can help pluralize the methodological approaches to studying EOTE and enrich the understanding of EOTE with additional sorts of empirical evidence.

Another thorny issue revolves around how to evaluate the effects of EOTE interventions on PSTs after they graduate from teacher education programs and go on to teach. Only ten studies in this review used the longitudinal research design to trace EOTE interventions' impact on PSTs with limited times of data collection, less comparable instruments, and relatively short time spans. Previous studies (e.g., Mintz et al., 2020) has revealed a significant gap between what PSTs have learned in their preservice education and what they can effectively perform in their future classrooms, and such a gap seems to be even wider for teachers who intend to use equity-oriented teaching in their practices. Future studies can capitalize on plural methodological approaches, such as longitudinal research, quasi-experimental research, and action research, to trace the extended effects of EOTE interventions on the graduates of teacher education programs (Atkins & Duckworth, 2019). Scholars should also explore professional support and programs that can enable teachers to sustainably practice equity-oriented teaching in their situated contexts over time (Bottiani et al., 2018).

The third issue centers on why we should prioritize equity over other values (e.g., standardization, efficiency) in teacher education. In fact, as López et al. (2021) and Zeichner (2010) point out, EOTE is persistently attacked by individuals or social groups who intend to perpetuate educational and social inequity for explicit and implicit reasons. In the face of such pushbacks, we scholars committed to EOTE should clearly state and firmly defend our stance on enhancing educational and social equity for the benefit of all children, especially those who are traditionally disadvantaged. In particular, future studies should strengthen the empirical, epistemological, and theoretical grounds of EOTE. Scholars can use comparative and experimental research designs to identify the effects of teacher education programs guided by different core values on PSTs. By comparing and contrasting the effects across programs, this type of research can help identify the relative and distinctive strengths of EOTE. In terms of epistemological stances, scholars need to recognize that equity-related issues are deeply involved with self-positioning, power negotiations, and social (re)construction. Therefore, we should take more critical stances to carry out action research, write for the public, and influence policy-making to improve the educational, institutional, and social conditions for practicing EOTE (Francis et al., 2017).

Lastly, scholars should also further advance the theoretical grounds of EOTE. It is encouraging to witness that a series of theories regarding the meanings, functions, practices, and outcomes of EOTE has been taking shape, especially in the United States (e.g., Cochran-Smith, 2010; Kohli et al., 2022). Standing on such an expanding body of theories, we encourage future studies to draw on experiences and perspectives from more diverse educational, national, and socio-cultural contexts to enrich the existing theories to better inform the research on and practice of EOTE. We hope that the empirical evidence we have synthesized in this review and the

scale model of EOTE that has emerged from our synthesis can help advance EOTE and related fields in teacher education to make education more inclusive, equitable, and empowering for all students around the world.

## Funding

This research was supported by the National Natural Science Foundation of China [Grant Number 71974016; Project Title: How to Improve Teacher Preparation Quality] and the International Joint Research Project of Huiyan International College, Faculty of Education, Beijing Normal University (Grant Number: ICER201905; Project Title: How to Prepare a Good Teacher).

## Authorship contributions

Wei Liao: conception and design of the study, analysis and interpretation of data, drafting the manuscript, revising the manuscript; Chonggao Wang: acquisition of data, analysis and interpretation of data, drafting the manuscript, revising the manuscript; Jingtian Zhou: acquisition of data, analysis and interpretation of data, drafting the manuscript, revising the manuscript; Zhaodi Cui: acquisition of data, analysis and interpretation of data, drafting the manuscript, revising the manuscript; Xiaohong Sun: acquisition of data, analysis and interpretation of data, revising the manuscript; Yanling Bo: acquisition of data, analysis and interpretation of data, revising the manuscript; Miao Xu: acquisition of data, analysis and interpretation of data, revising the manuscript; Qian Dang: acquisition of data, analysis and interpretation of data, revising the manuscript.

## Declaration of competing interest

The authors declare that there is no conflict of interest.

## References

- Acquah, E. O., & Szelei, N. (2020). The potential of modelling culturally responsive teaching: Pre-service teachers' learning experiences. *Teaching in Higher Education*, 25(2), 157–173. <https://doi.org/10.1080/13562517.2018.1547275>
- Anderson, V., McKenzie, M., Allan, S., Hill, T., McLean, S., Kayira, J., Knorr, M., Stone, J., Murphy, J., & Butcher, K. (2015). Participatory action research as pedagogy: Investigating social and ecological justice learning within a teacher education program. *Teaching Education*, 26(2), 179–195. <https://doi.org/10.1080/10476210.2014.996740>
- Anderson, L., & Stillman, J. (2011). Student teaching for a specialized view of professional practice? Opportunities to learn in and for urban, high-needs schools. *Journal of Teacher Education*, 62(5), 446–464. <https://doi.org/10.1177/2F0022487111412052>
- Atkins, L., & Duckworth, V. (2019). *Research methods for social justice and equity in education*. Bloomsbury Publishing. <https://link.springer.com/content/pdf/10.1007%2F978-3-030-05900-2.pdf>
- Australian Institute for Teaching and School Leadership (AITSL). (2018). *Australian professional standards for teachers*. <https://www.aitsl.edu.au/teach/standards>
- Baily, S., Stribling, S. M., & McGowan, C. L. (2014). Experiencing the “growing edge”: Transformative teacher education to foster social justice perspectives. *Journal of Transformative Education*, 12(3), 248–265. <https://doi.org/10.1177/2F1541344614544373>
- Baloche, L. (2014). Everybody has a story: Storytelling as a community building exploration of equity and access. *Intercultural Education*, 25(3), 206–215. <https://doi.org/10.1080/14675986.2014.905240>
- Bell, N. S., & Coddling, D. (2021). *Equity scenario response survey: Understanding teacher candidates' preparation of their sociopolitical identity*. Urban Education. <https://doi.org/10.1177/00420859211027616>
- Bernardi, F., & Ballarino, G. (2016). Education as the great equalizer: A theoretical framework. In F. Bernardi, & G. Ballarino (Eds.), *Education, occupation and social origin* (pp. 1–19). Edward Elgar Publishing. <https://www.elgaronline.com/view/edcoll/9781785360442/9781785360442.00006.xml>
- Bleicher, E. (2011). Parsing the language of racism and relief: Effects of a short-term urban field placement on teacher candidates' perceptions of culturally diverse classrooms. *Teaching and Teacher Education*, 27(8), 1170–1178. <https://doi.org/10.1016/j.tte.2011.05.001>

- 10.1016/j.tate.2011.06.001
- Bottiani, J. H., Larson, K. E., Debnam, K. J., Bischoff, C. M., & Bradshaw, C. P. (2018). Promoting educators' use of culturally responsive practices: A systematic review of inservice interventions. *Journal of Teacher Education*, 69(4), 367–385. <https://doi.org/10.1177/2F0022487117722553>
- Boyd, A. S., & Noblit, G. W. (2015). Engaging students in autobiographical critique as a social justice tool: Narratives of deconstructing and reconstructing meritocracy and privilege with preservice teachers. *Educational Studies: Journal of the American Educational Studies Association*, 51(6), 441–459. <https://doi.org/10.1080/00131946.2015.1098644>
- Boylan, M., Coldwell, M., Maxwell, B., & Jordan, J. (2018). Rethinking models of professional learning as tools: A conceptual analysis to inform research and practice. *Professional Development in Education*, 44(1), 120–139. <https://doi.org/10.1080/19415257.2017.1306789>
- Broderick, A., & Lavani, P. (2017). Dysconscious ableism: Toward a liberatory praxis in teacher education. *International Journal of Inclusive Education*, 21(9), 894–905. <https://doi.org/10.1080/13603116.2017.1296034>
- Byker, E. J., & Marquardt, S. K. (2016). Using critical cosmopolitanism to globally situate: Multicultural education in teacher preparation courses. *Journal of Social Studies Education Research*, 7(2), 30–50. <https://files.eric.ed.gov/fulltext/EJ1121646.pdf>
- Cho, H., & Choi, J. (2016). Teaching for social justice: Voices from prospective South Korean elementary teachers. *KEDI Journal of Educational Policy*, 13(2), 259–282. <https://www.proquest.com/docview/1855398708?pq-origsite=gscholar&fromopenview=true>
- Chong, E. K. M., Davies, I., & Pao, S. S. (2020). Teaching about and for social justice in teacher education in Hong Kong. *Citizenship, Social and Economics Education*, 19(3), 211–227. <https://doi.org/10.1177/2F2047173420957380>
- Christopher, D. H., & Taylor, M. J. (2011). Social justice and critical peace education: Common ideals guiding student teacher transformation. *Journal of Peace Education*, 8(3), 295–313. <https://doi.org/10.1080/17400201.2011.621358>
- Cobb, C., & Sharma, M. (2015). I've got you covered: Adventures in social justice-informed co-teaching. *The Journal of Scholarship of Teaching and Learning*, 15(4), 41–57. <https://files.eric.ed.gov/fulltext/EJ1074798.pdf>
- Cochran-Smith, M. (2010). Toward a theory of teacher education for social justice. In A. Hargreaves, A. Lieberman, M. Fullan, & D. Hopkins (Eds.), *Second international handbook of educational change* (pp. 445–467). Springer. [https://doi.org/10.1007/978-90-481-2660-6\\_27](https://doi.org/10.1007/978-90-481-2660-6_27)
- Cochran-Smith, M. (2020). Teacher education for justice and equity: 40 years of advocacy. *Action in Teacher Education*, 42(1), 49–59. <https://doi.org/10.1080/01626620.2019.1702120>
- Cochran-Smith, M., & Villegas, A. M. (2015). Framing teacher preparation research: An overview of the field, part 1. *Journal of Teacher Education*, 66(1), 7–20. <https://doi.org/10.1177/2F0022487114549072>
- Conklin, H. G., & Hughes, H. E. (2016). Practices of compassionate, critical, justice-oriented teacher education. *Journal of Teacher Education*, 67(1), 47–60. <https://doi.org/10.1177/2F0022487115607346>
- Convertino, C. (2016). Beyond ethnic tidbits: Toward a critical and dialogical model in multicultural social justice teacher preparation. *International Journal of Multicultural Education*, 18(2), 125–142. <https://doi.org/10.18251/ijme.v18i2.1074>
- Council of Chief State School Officers (CCSSO). (2013). *INTASC model core teaching standards and learning progressions for teachers 1.0: A resource for ongoing teacher development*. [https://ccsso.org/sites/default/files/2017-12/2013\\_INTASC\\_Learning\\_Progressions\\_for\\_Teachers.pdf](https://ccsso.org/sites/default/files/2017-12/2013_INTASC_Learning_Progressions_for_Teachers.pdf)
- Darling-Hammond, L., Newton, X., & Wei, R. C. (2010). Evaluating teacher education outcomes: A study of the Stanford teacher education programme. *Journal of Education for Teaching*, 36(4), 369–388. <https://doi.org/10.1080/02607476.2010.513844>
- Dodman, S. L., DeMulder, E. K., View, J. L., Swallow, K., Stribling, S., Ra, S., & Dallman, L. (2019). Equity audits as a tool of critical data-driven decision making: Preparing teachers to see beyond achievement gaps and bubbles. *Action in Teacher Education*, 41(1), 4–22. <https://doi.org/10.1080/01626620.2018.1536900>
- Dyce, C. M., & Owusu-Ansah, A. (2016). Yes, we are still talking about diversity: Diversity education as a catalyst for transformative, culturally relevant, and reflective preservice teacher practices. *Journal of Transformative Education*, 14(4), 327–354. <https://doi.org/10.1177/2F1541344616650750>
- Ellis, S., Thompson, I., McNicholl, J., & Thomson, J. (2016). Student teachers' perceptions of the effects of poverty on learners' educational attainment and well-being: Perspectives from England and Scotland. *Journal of Education for Teaching*, 42(4), 483–499. <https://doi.org/10.1080/02607476.2016.1215542>
- Francis, B., Mills, M., & Lupton, R. (2017). Towards social justice in education: Contradictions and dilemmas. *Journal of Education Policy*, 32(4), 414–431. <https://doi.org/10.1080/02680939.2016.1276218>
- Fylkesnes, S. (2018). Whiteness in teacher education research discourses: A review of the use and meaning making of the term cultural diversity. *Teaching and Teacher Education*, 71, 24–33. <https://doi.org/10.1016/j.tate.2017.12.005>
- Gachago, D., Condry, J., Ivala, E., & Chigona, A. (2014). All stories bring hope because stories bring awareness: Students' perceptions of digital storytelling for social justice education. *South African Journal of Education*, 34(4), 1–12. <https://hdl.handle.net/10520/EJC162724>
- Goodwin, A. L., & Darity, K. (2019). Social justice teacher educators: What kind of knowing is needed? *Journal of Education for Teaching*, 45(1), 63–81. <https://doi.org/10.1080/02607476.2019.1550606>
- Gorski, P. C. (2009). What we're teaching teachers: An analysis of multicultural teacher education coursework syllabi. *Teaching and Teacher Education*, 25(2), 309–318. <https://doi.org/10.1016/j.tate.2008.07.008>
- Grossman, P., Hammerness, K., & McDonald, M. (2009). Redefining teaching, reimagining teacher education. *Teachers and Teaching: Theory and Practice*, 15(2), 273–289. <https://doi.org/10.1080/13540600902875340>
- Grudnoff, L., Dixon, H., & Murray, J. (2021). The power of inquiry in equity-oriented teacher education. *Beijing International Review of Education*, 3(3), 368–386. [https://www.academia.edu/76751228/The\\_Power\\_of\\_Inquiry\\_in\\_Equity\\_Oriented\\_Teacher\\_Education](https://www.academia.edu/76751228/The_Power_of_Inquiry_in_Equity_Oriented_Teacher_Education)
- Grudnoff, L., Haigh, M., Hill, M., Cochran-Smith, M., Ell, F., & Ludlow, L. (2016). Rethinking initial teacher education: Preparing teachers for schools in low socio-economic communities in New Zealand. *Journal of Education for Teaching*, 42(4), 451–467. <https://doi.org/10.1080/02607476.2016.1215552>
- Hai-Jew, S. (Ed.). (2019). *Online survey design and data analytics: Emerging research and opportunities*. IGI Global. <https://www.igi-global.com/gateway/book/218301>
- Hatfield, E., Salmon, M., & Rapson, R. L. (2011). Equity theory and social justice. *Journal of Management, Spirituality & Religion*, 8(2), 101–121. <https://doi.org/10.1080/14766086.2011.581818>
- Helmer, K. (2014). Disruptive practices: Enacting critical pedagogy through meditation, community building, and explorative spaces in a graduate course for pre-service teachers. *Journal of Classroom Interaction*, 49(2), 33–40. <https://files.eric.ed.gov/fulltext/EJ1100389.pdf>
- Hennig, L. C., Schaefer, L., & Gledzie, D. (2020). In(di)visible: Inquiring into being 'othered' as a means to teach social justice in PHETE. *Physical Education and Sport Pedagogy*, 25(6), 666–680. <https://doi.org/10.1080/17408989.2020.1789573>
- Hill, D., Greaves, N. M., & Maisuria, A. (2009). Education, inequality, and neoliberal capitalism: A classical marxist analysis. In D. Hill, & R. Kumar (Eds.), *Global neoliberalism and education and its consequences* (pp. 102–126). Routledge.
- Howard, C. M., & Ticknor, A. S. (2019). Affirming cultures, communities and experiences: Teaching for social justice in teacher education literacy courses. *The Clearing House: A Journal of Educational Strategies, Issues and Ideas*, 92(1–2), 28–38. <https://doi.org/10.1080/00098655.2018.1551185>
- Hubbard, J., & Swain, H. H. (2017). Using the U.S. civil rights movement to explore social justice education with K-6 pre-service teachers. *Journal of Social Studies Research*, 41(3), 217–233. <https://doi.org/10.1016/j.jssr.2016.09.002>
- Ingvarson, L., & Rowley, G. (2017). Quality assurance in teacher education and outcomes: A study of 17 countries. *Educational Researcher*, 46(4), 177–193. <https://doi.org/10.3102/2F0013189X17711900>
- Iyer, R., Carrington, S., Mercer, L., & Selva, G. (2018). Critical service-learning: Promoting values orientation and enterprise skills in pre-service teacher programmes. *Asia-Pacific Journal of Teacher Education*, 46(2), 133–147. <https://doi.org/10.1080/1359866X.2016.1210083>
- Kang, D. Y., & Martin, S. N. (2018). Improving learning opportunities for special education needs (SEN) students by engaging pre-service science teachers in an informal experiential learning course. *Asia Pacific Journal of Education*, 38(3), 319–347. <https://doi.org/10.1080/02188791.2018.1505599>
- Kang, H., & Zinger, D. (2019). What do core practices offer in preparing novice science teachers for equitable instruction? *Science Education*, 103(4), 823–853. <https://doi.org/10.1002/sce.21507>
- Kaur, B. (2012). Equity and social justice in teaching and teacher education. *Teaching and Teacher Education*, 28(4), 485–492. <https://doi.org/10.1016/j.tate.2012.01.012>
- Kim, Y., & Choi, M. (2020). Towards critical multicultural teacher education in the midst of ethno-nationalism: Korean pre-service teachers' international learning experiences. *Teaching and Teacher Education*, 96, Article 103155. <https://doi.org/10.1016/j.tate.2020.103155>
- Kim, T., & Lee, J. (2020). Measuring teacher effectiveness for equity: Value-added model of teachers' distributive effects on classroom achievement gaps. *Educational Research and Evaluation*, 26(1–2), 30–52. <https://doi.org/10.1080/13803611.2021.1906708>
- Knif, L., & Kairavuori, S. (2020). Student teachers building a sustainable future through constructing equality in visual arts education. *Discourse and Communication for Sustainable Education*, 11(1), 74–90. <https://doi.org/10.2478/dcse-2020-0008>
- Kohli, R., Dover, A. G., Jayakumar, U. M., Lee, D., Henning, N., Comeaux, E., Nevárez, A., Hipolito, E., Carreno Cortez, A., & Vizcarra, M. (2022). Toward a healthy racial climate: Systemically centering the well-being of teacher candidates of color. *Journal of Teacher Education*, 73(1), 52–65. <https://doi.org/10.1177/2F00224871211051980>
- Kondo, C., & Bracho, C. A. (2019). Friendly resistance: Narratives from a preservice teacher of color navigating diversity courses. *Educational Studies*, 55(2), 139–159. <https://doi.org/10.1080/00131946.2018.1500913>
- Korthagen, F. (2017). Inconvenient truths about teacher learning: Towards professional development 3.0. *Teachers and Teaching*, 23(4), 387–405. <https://doi.org/10.1080/13540602.2016.1211523>
- Kraehe, A. M., & Brown, K. D. (2011). Awakening teachers' capacities for social justice With/In arts-based inquiries. *Equity & Excellence in Education*, 44(4), 488–511. <https://doi.org/10.1080/10665684.2011.610682>
- Lemley, C. K. (2014). Social justice in teacher education: Naming discrimination to promote transformative action. *Critical Questions in Education*, 5(1), 26–51. <https://files.eric.ed.gov/fulltext/EJ1046698.pdf>
- Liao, W. (2020). Using collaborative video-cued narratives to study professional



- learning: A reflective analysis. *International Journal of Qualitative Methods*, 19, 1–13. <https://doi.org/10.1177/1609406920949335>
- Liao, W. (2021a). Equity-oriented teacher education: Introduction to the special issue. *Beijing International Review of Education*, 3(3), 323–325. <https://doi.org/10.1163/25902539-03030006>
- Liao, W., Wang, X., & Qin, K. (2021b). Learning to become culturally responsive teacher educators in an internationalized doctoral course: A video-cued interpretive study. *Teaching and Teacher Education*, 102, 103339. <https://doi.org/10.1016/j.tate.2021.103339>
- Lillge, D., & Knowles, A. (2020). Sticking points: Sites for developing capacity to enact socially just instruction. *Teaching and Teacher Education*, 94, Article 103098. <https://doi.org/10.1016/j.tate.2020.103098>
- Liu, A., Toma, S., Levis-Fitzgerald, M., & Russell, A. A. (2020). The role of a summer field experience in fostering STEM students' socioemotional perceptions and social justice awareness as preparation for a science teaching career. *Berkeley Review of Education*, 9(2). <https://doi.org/10.5070/B89244648>
- López, F., Molnar, A., Johnson, R., Patterson, A., Ward, L., & Kumashiro, K. (2021). *Understanding the attacks on critical race theory*. National Education Policy Center. <https://nepc.colorado.edu/publication/crt>
- Lund, D., & Lee, L. (2015). Fostering cultural humility among pre-service teachers: Connecting with children and youth of immigrant families through service-learning. *Canadian Journal of Education*, 38(2), 1–30. <https://doi.org/10.1002/978119144397.ch11>
- Max, B. (2017). Preservice secondary mathematics teachers' conceptualizations of equity: Access and power as seen through vignette responses. *School Science & Mathematics*, 117(7–8), 286–294. <https://doi.org/10.1111/ssm.12246>
- Mertler, C. A. (2021). *Introduction to educational research* (3<sup>rd</sup> ed.). Sage.
- Mills, C., & Ballantyne, J. (2016). Social justice and teacher education: A systematic review of empirical work in the field. *Journal of Teacher Education*, 67(4), 263–276. <https://doi.org/10.1177/2F0022487116660152>
- Mincu, M., & Granata, A. (2021). Teachers' informal leadership for equity in France and Italy during the first wave of the education emergency. *Teachers and Teaching*, 1–21. <https://doi.org/10.1080/13540602.2021.1986695>
- Mintz, J., Hick, P., Solomon, Y., Matziari, A., O'Murchú, F., Hall, K., Cahill, K., Curtin, C., Anders, J., & Margariti, D. (2020). The reality of reality shock for inclusion: How does teacher attitude, perceived knowledge and self-efficacy in relation to effective inclusion in the classroom change from the pre-service to novice teacher year? *Teaching and Teacher Education*, 91, Article 103042. <https://doi.org/10.1016/j.tate.2020.103042>
- Moher, D., Liberati, A., Tetzlaff, J., Altman, D. G., & Prisma Group.. (2009). Preferred reporting items for systematic reviews and meta-analyses: The PRISMA statement. *PLoS Medicine*, 6(7), Article e1000097. <https://doi.org/10.1371/journal.pmed.1000097>
- Murdoch, D. D., & Hamel, E. (2016). I would quit my job:" Unpacking preservice teachers' perceptions of culture and diversity. *The International Journal of Critical Pedagogy*, 7(2), 85–106. <http://libjournal.uncg.edu/ijcp/article/view/1091/944>
- National Academies of Sciences, Engineering, and Medicine. (2019). *Monitoring educational equity*. The National Academies Press.
- Newton, J., Oudghiri, S., Obenchain, K., & Phillion, J. (2020). Preservice teachers' understandings of social justice within the context of study abroad programs. *Theory Into Practice*, 59(3), 259–268. <https://doi.org/10.1080/00405841.2020.1739956>
- Nganga, L. (2019). Preservice teachers' perceptions and preparedness to teach for global mindedness and social justice using collaboration, critical thinking, creativity and communication (4cs). *Journal of Social Studies Education Research*, 10(4), 26–57. <https://jsser.org/index.php/jsser/article/view/1262/407>
- Nguyen, C. D., & Zeichner, K. (2021). Second language teachers learn to teach for social justice through community field experiences. *Language Teaching Research*, 25(4), 656–678. <https://doi.org/10.1177/2F1362168819868739>
- Nichols, J., & Sullivan, B. M. (2016). Learning through dissonance: Critical service-learning in a juvenile detention center as field experience in music teacher education. *Research Studies in Music Education*, 38(2), 155–171. <https://doi.org/10.1177/2F1321103X16641845>
- Nowell, S. D., & Poindexter, N. K. (2019). Holocaust education as a path to prepare preservice social studies teachers to be social justice educators. *Journal of Social Studies Research*, 43(3), 285–298. <https://doi.org/10.1016/j.jssr.2018.03.003>
- Ohito, E. O. (2016). Making the emperor's new clothes visible in anti-racist teacher education: Enacting a pedagogy of discomfort with white preservice teachers. *Equity & Excellence in Education*, 49(4), 454–467. <https://doi.org/10.1080/10665684.2016.1226104>
- Payne, E. C., & Smith, M. J. (2012). Safety, celebration, and risk: Educator responses to LGBTQ professional development. *Teaching Education*, 23(3), 265–285. <https://doi.org/10.1080/10476210.2012.699520>
- Petersen, N., & Henning, E. (2018). Service learning and the practice of social justice and care. *Journal of Human Behavior in the Social Environment*, 28(4), 436–448. <https://doi.org/10.1080/10911359.2017.1418697>
- Pugach, M. C., Gomez-Najarro, J., & Matewos, A. M. (2019). A review of identity in research on social justice in teacher education: What role for intersectionality? *Journal of Teacher Education*, 70(3), 206–218. <https://doi.org/10.1177/0022487118760567>
- Rahatzad, J., Sasser, H. L., Phillion, J., Karimi, N., Deng, Y., Akiyama, R., & Sharma, S. (2013). Postglobal teacher preparation: Border thinking along the global south through international cross-cultural experiences. *International Journal of Multicultural Education*, 15(3), 76–96. <https://doi.org/10.18251/ijme.v15i3.709>
- Reagan, E. M., Chen, C., & Vernikoff, L. (2016). Teachers are works in progress": A mixed methods study of teaching residents' beliefs and articulations of teaching for social justice. *Teaching and Teacher Education*, 59, 213–227. <https://doi.org/10.1016/j.tate.2016.05.011>
- Reagan, E. M., & Hambacher, E. (2021). Teacher preparation for social justice: A synthesis of the literature, 1999–2019. *Teaching and Teacher Education*, 108, Article 103520. <https://doi.org/10.1016/j.tate.2021.103520>
- Riley, T., Monk, S., & Vanlssum, H. (2019). Barriers and breakthroughs: Engaging in socially just ways towards issues of indigeneity, identity, and whiteness in teacher education. *Whiteness and Education*, 4(1), 88–107. <https://doi.org/10.1080/23793406.2019.1625283>
- Riley, K., & Solic, K. (2017). "Change happens beyond the comfort zone": Bringing undergraduate teacher-candidates into activist teacher communities. *Journal of Teacher Education*, 68(2), 179–192. <https://doi.org/10.1177/2F0022487116687738>
- Ritchie, S., An, S., Cone, N., & Bullock, P. (2013). Teacher education for social change: Transforming a content methods course block. *Current Issues in Comparative Education*, 15(2), 63–83. <https://files.eric.ed.gov/fulltext/EJ1016200.pdf>
- Schillinger, D. (2018). Aristotle, equity, and democracy. *Polis: The Journal for Ancient Greek and Roman Political Thought*, 35(2), 333–355.
- Schoeb, D., Suarez-Ibarrola, R., Hein, S., Dressler, F. F., Adams, F., Schlager, D., & Miernik, A. (2020). Use of artificial intelligence for medical literature search: Randomized controlled trial using the Hackathon format. *Interactive Journal of Medical Research*, 9(1), Article e16606. <https://doi.org/10.2196/16606>
- Sharma, S., Rahatzad, J., & Phillion, J. A. (2013). How preservice teachers engage in the process of (de)colonization: Findings from an international field experience in Honduras. *Interchange*, 43(4), 363–377. <https://doi.org/10.1007/s10780-013-9182-2>
- Shelley, K., & McCuaig, L. (2018). Close encounters with critical pedagogy in socio-critically informed health education teacher education. *Physical Education and Sport Pedagogy*, 23(5), 510–523. <https://doi.org/10.1080/17408989.2018.1470615>
- Sleeter, C. (2014). Toward teacher education research that informs policy. *Educational Researcher*, 43(3), 146–153. <https://doi.org/10.3102/2F0013189X14528752>
- Solic, K., & Riley, K. (2019). Teacher candidates' experiences taking up issues of race and racism in an urban education fellowship program. *Action in Teacher Education*, 41(2), 99–116. <https://doi.org/10.1080/01626620.2018.1561549>
- Sosa-Provencio, M. A., Sheahan, A., Fuentes, R., Muñiz, S., & Prada Vivas, R. E. (2019). Reclaiming ourselves through testimonio pedagogy: Reflections on a curriculum design lab in teacher education. *Race, Ethnicity and Education*, 22(2), 211–230. <https://doi.org/10.1080/13613324.2017.1376637>
- Stanton, S. M., & Gonzalez, G. (2011). Students find their place in history: Using theatre to expand pre-service teachers' multicultural awareness. *Multicultural Education*, 18(4), 46–52. <https://files.eric.ed.gov/fulltext/EJ963749.pdf>
- Tan, P., & Padilla, A. (2019). Prospective mathematics teachers' engagement with inclusive equity: An exploratory case study in anti-ableist sociopolitical grounding. *Teaching and Teacher Education*, 86, Article 102853. <https://doi.org/10.1016/j.tate.2019.06.007>
- Taylor, P. (2020). The complexity of teacher professional growth – unravelling threads of purpose, opportunity and response. *Professional Development in Education*, 46(4), 652–663. <https://doi.org/10.1080/19415257.2020.1747106>
- Thompson, S. A. (2012). Thrice disabling disability: Enabling inclusive, socially just teacher education. *International Journal of Inclusive Education*, 16(1), 99–117. <https://doi.org/10.1080/13603111003671640>
- Tinkler, B., & Tinkler, A. (2013). Experiencing the other: The impact of service-learning on preservice teachers' perceptions of diversity. *Teacher Education Quarterly*, 40(4), 41–62. <https://doi.org/10.1177/2F0022487113494845>
- Tinkler, A., & Tinkler, B. (2016). Enhancing cultural humility through critical service-learning in teacher preparation. *Multicultural Perspectives*, 18(4), 192–201. <https://doi.org/10.1080/15210960.2016.1222282>
- Tinkler, A., Tinkler, B., Reyes, C., & Elkin, S. (2019). Critical service-learning: Learning through experience to advance teacher education. *Journal of Experiential Education*, 42(1), 65–78. <https://doi.org/10.1177/2F1053825918820662>
- UNESCO. (2020). *Global education monitoring report 2020: Inclusion and education: All means all*. <https://unesdoc.unesco.org/ark:/48223/pf0000373718>
- United Nation. (2020). *World social report 2020: Inequality in a rapidly changing world*. <https://www.un.org/development/desa/dspd/wp-content/uploads/sites/22/2020/02/World-Social-Report2020-FullReport.pdf>
- VandenBos, G. R. (2007). *APA dictionary of psychology*. American Psychological Association.
- Villegas, A. M., & Lucas, T. (2002). Preparing culturally responsive teachers: Rethinking the curriculum. *Journal of Teacher Education*, 53(1), 20–32. <https://doi.org/10.1177/2F0022487102053001003>
- Whipp, J. L. (2013). Developing socially just teachers: The interaction of experiences before, during, and after teacher preparation in beginning urban teachers. *Journal of Teacher Education*, 64(5), 454–467. <https://doi.org/10.1177/2F0022487113494845>
- White, M. L., & Murray, J. (2016). Seeing disadvantage in schools: Exploring student teachers' perceptions of poverty and disadvantage using visual pedagogy. *Journal of Education for Teaching*, 42(4), 500–515. <https://doi.org/10.1080/02607476.2016.1215543>
- Zeichner, K. (2010). Competition, economic rationalization, increased surveillance, and attacks on diversity: Neo-liberalism and the transformation of teacher education in the US. *Teaching and Teacher Education*, 26(8), 1544–1552. <https://doi.org/10.1016/j.tate.2010.06.004>