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# Promoting Awareness and Self-Efficacy for Culturally Responsive Teaching of Pre-Service Teachers Through the *Identity Project* – a Mixed Methods Study

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## ABSTRACT

Culturally Responsive Teaching (CRT) provides a framework for teachers to include students' ethnic-cultural identities in class, aiming to tackle issues of educational and societal inequity. This quasi-experimental mixed methods intervention study tested whether pre-service teachers attending a seminar based on an ethnic-cultural identity school intervention, the *Identity Project*, would show greater CRT self-efficacy and more positive beliefs about teaching in ethnic-culturally diverse classes, compared to a control group. Repeated measures ANCOVAs of survey data from 606 pre-service teachers in Germany indicated a stronger T1-T2 increase in confidence for interacting with ethnic-culturally diverse students and engaging in culture- and ethnic-related conversations in the intervention group. No significant time-by-group interactions emerged for other CRT facets. A content analysis of brief texts of pre-service teachers in the intervention group revealed they became more self-reflective about their own beliefs, learned about CRT practices for their own teaching, and gained confidence for including issues of ethnicity and culture in class. Yet, the complexity of ethnic-cultural diversity-related topics left some pre-service teachers feeling overwhelmed about how to adequately address ethnic-cultural diversity in the classroom. Overall, the *Identity Project* seminar raised pre-service teachers' awareness and self-efficacy for engaging in CRT in the future.

Creating a teaching atmosphere that values students' ethnic-cultural identities, offers opportunities for students to refer to their experiences and perspectives in class, and tackles issues of inequity, are important aims for teachers in increasingly diverse societies. Studies in the US and Europe provide evidence that students' ethnic(–racial)-cultural[1] identities can be valuable psychological and/or psychosocial assets, e.g., for students' self-esteem, well-being and academic engagement and achievement (see Rivas-Drake et al., 2014; Schotte et al., 2018; Verkuyten, 2008). In contrast, negative stereotypes about historically marginalized groups,[2] and thus ethnic(–racial)-cultural identifications, can limit students' school success (Steele, 1997). Teachers who are supportive of students of diverse ethnic-cultural identities and are aware of negative implications related to those identities, such as being confronted with stereotypes or experiencing racism, are essential. The concept of Culturally Responsive Teaching (CRT; Gay, 2018) aims at creating the best possible learning environments for all students and offers a framework to include students' ethnic-cultural identities and combat inequity in the classroom.

A major task of CRT is to include students' ethnic-cultural identities in class. Ethnic-cultural or -racial identity is understood as a "multidimensional, psychological construct that reflects the beliefs and attitudes that individuals have about their ethnic-racial group memberships, as well as the processes by which these beliefs and attitudes develop over time" (Umaña-Taylor et al., 2014, p. 3). Among other components, private regard (or affirmation) is highlighted as feeling positively toward one's ethnic-racial group and is linked to greater academic and psychological well-being (Umaña-Taylor et al., 2014). Importantly, contexts matter for students' perceptions and experiences regarding their own ethnic-cultural identities. In developmentally relevant contexts like schools (Eccles & Roeser, 2011), students are confronted with whether their ethnic-cultural identities are included and valued in class, e.g. by teachers and other students, or whether their ethnic-cultural identities are ignored or even perceived as negative or challenging in school. These aspects refer to the ethnic-cultural identity component of public regard – "the extent to which youth feel that others (individuals, groups, and the broader society) view their ethnic-racial group positively or negatively" (Umaña-Taylor et al., 2014, p. 8). Teachers should know why ethnic-cultural identities can be meaningful for some students and their development and how to adequately include students' ethnic-cultural identities in their own teaching.

Consequently, our study tests whether pre-service teachers who critically reflect on their own and their students' identities become more likely to engage in culturally responsive teaching. We do so by evaluating a university seminar designed for pre-service teachers to prepare them for teaching in ethnic-culturally diverse classrooms. The seminar is based on the *Identity Project* (Umaña-Taylor & Douglass, 2017), a school intervention developed in the US that promotes students' ethnic-racial identity development. The *Identity Project* seminar provided pre-service teachers with concrete activities to include students' ethnic-cultural identities and theoretical knowledge about concepts connected to ethnic-cultural identities such as stereotypes and guided discussions.

Using a mixed methods approach, we test whether pre-service teachers in the *Identity Project* seminar who engaged in guided critical reflection regarding their own and students' ethnic-cultural identities also changed along several CRT-related dimensions. In the quantitative strand, we examined whether pre-service teachers in the intervention group (compared to a control group) show greater self-efficacy for teaching in ethnic-culturally diverse classrooms and more positive beliefs about teaching in ethnic-culturally diverse classrooms. In the qualitative strand, we explored how the development of CRT in the intervention group is reflected in short written texts and how the seminar informed the awareness of their own and students' ethnic-cultural identities and development as future teachers.

## CRT: self-efficacy, beliefs, and the importance of identities

CRT (Gay, 2018) provides a framework for teachers' actions, interactions, reflections, and values when teaching in multicultural classrooms to promote equitable educational opportunities for all students and ethnic-culturally historically marginalized students in particular. Building on multicultural education research (Banks, 2015), CRT implies that students are taught more effectively because "when academic knowledge and skills are situated within the lived experiences and frames of reference of students, they are more personally meaningful, have higher interest appeal, and are learned more easily and thoroughly" (Gay, 2002, p. 106). In other words, considering students' diverse lived realities and ethnic-cultural identities is a way to facilitate learning. This is particularly relevant for students of marginalized groups, whose family heritage cultures are less represented (e.g. in learning materials, everyday school life or curricula) and often less valued compared to majoritized students (Baysu et al., 2021). Thus, ethnic(-racial)-cultural identities are the key element for CRT. Additionally, culturally responsive teachers should also consider ethnic-cultural group belongings alongside with perceiving students as individuals (Gay, 2002).

Essential components of CRT, guiding *how* educational opportunities can be improved in the school context, are: (1) high achievement expectations for all students, (2) knowledge about cultural diversity, (3) culturally relevant curricula, (4) multicultural instructional examples, and (5) the

appreciation for various strategies for communication (Gay, 2002). When CRT is implemented, students from both historically minoritized and majoritized groups can benefit regarding students' academic motivation, engagement, and school performance, even in subjects perceived as less strongly influenced by culture (Aronson & Laughter, 2016). Beyond school performance, their school belonging, the development of more positive outgroup orientations, as well as their sociopolitical awareness, critical thinking and ethnic-racial identity development are promoted (Aronson & Laughter, 2016; Byrd, 2016). Combining research on CRT and ethnic-cultural identities suggests the need to identify effective training to promote CRT and the inclusion of diverse ethnic-racial identities in teaching (Byrd, 2016). Moreover, although teachers are expected to be competent in culturally diverse classrooms, many teachers do not feel adequately prepared (Shuali Trachtenberg et al., 2020).

General self-efficacy (Bandura, 1977) and self-efficacy with engaging in CRT is important for future teachers. A review of studies of teachers' general self-efficacy provides evidence for favorable links to students' academic adjustment and motivation, creating a supportive academic climate, as well as teachers' own well-being, namely better job satisfaction and the prevention of burnout and job-related stress (Zee & Koomen, 2016). General teaching self-efficacy however does not necessarily capture how competent teachers feel regarding teaching in a culturally responsive way (Siwatu, 2007). CRT self-efficacy refers to a teachers' belief about the self in terms of competence regarding supporting all students academically, preparing culturally relevant lessons, reducing conflict between schools and families, and creating a supportive classroom climate (Siwatu, 2007). CRT self-efficacy is associated with less cultural diversity-related stress (Civitillo et al., 2016) and can predict teachers' actual implementations of CRT in practice and promote students' learning outcomes (Siwatu, 2007; for critical findings about the transfer into teaching practice see Civitillo et al., 2018; Stepp & Brown, 2021).

In addition, teachers' general beliefs about teaching in classes with ethnic-culturally diverse students are important to consider. Teachers' beliefs can guide teachers' intentions and behavior in the classrooms, impact what is perceived as relevant knowledge, and what behavior and skills are expected from students (Fives & Buehl, 2012). Teachers' deficit thinking, as perceiving historically marginalized students, their family or ethnic-cultural identity as barriers to academic success, can show in microaggressions against these students (Baker, 2019) and teachers' implicit biases can predict lower student outcomes (Denessen et al., 2022). Consequently, teachers should be aware of their own biases when teaching (Dovidio et al., 2016). Another relevant aspect of teachers' beliefs about teaching in ethnic-culturally diverse classes is the curriculum content. In the CRT framework, teachers are encouraged to provide curricula and teaching contents that allow connections to students' lives to improve learning and competence achievements (Banks, 2015; Gay, 2018). Thus, CRT requires teachers to include ethnic-cultural diversity in the curricula.

In sum, beliefs capture how (pre-service) teachers think about students, teaching contents, teaching contexts, and teaching practices or approaches (Fives & Buehl, 2012). CRT self-efficacy is interpreted as an essential factor for *applying* acquired CRT skills (Bandura, 1977; Siwatu, 2007). Thus, we differentiate CRT self-efficacy from other general beliefs about teaching in ethnic-culturally diverse classrooms in this study.

## *Teacher trainings in CRT and their effectiveness*

Civitillo et al. (2018) reviewed teacher trainings and their effects on CRT dimensions such as teachers' self-efficacy and beliefs regarding cultural diversity. Most trainings addressed dimensions of beliefs, including perceptions of ethnic-culturally diverse students, followed by culturally sensitive teaching practices, while few studies focused on beliefs about cultural content and knowledge, self-efficacy and cultural context and environment (Fives & Buehl, 2012). Training effects on teachers' CRT are mainly assessed through self-efficacy and beliefs (Civitillo et al., 2018; Miller et al., 2023). Data are commonly retrieved from self-rating scales for quantitative strands, and from interviews, written reflections or assignments, and observations for qualitative strands (Miller et al., 2023). Positive effects of the

trainings on pre-service teachers' beliefs were reported in most studies, with few studies indicating negative effects or mixed findings. Trainings with opportunities for experiential learning and self-reflection were particularly effective (Civitillo et al., 2018). The authors also identified methodological weaknesses, such as small sample sizes in quantitative or mixed methods studies, no comparison group, no longitudinal assessments, and no assessment of actual teaching practices as evaluations of self-reported self-efficacy. They recommend conducting mixed methods studies with control groups to evaluate overall efficacy and specific training components and to assess several belief dimensions in multiple courses.

### Designing a university seminar addressing ethnic-cultural identities and CRT

Based on theoretical perspectives regarding CRT self-efficacy, ethnic(-racial)-cultural identities and empirical research on effective teacher trainings, we developed an applied university seminar targeting pre-service teachers and centered on the *Identity Project* (Umaña-Taylor & Douglass, 2017). The *Identity Project* has been adapted in Germany (Juang et al., 2020) and other European countries (Juang et al., 2022). The *Identity Project* aims to prompt exploration and a clearer understanding of students' own and their classmates ethnic-cultural identities within broader societal contexts. It contains eight sessions with activities about students' ethnic-cultural identities and discussions about related topics, for example group belonging, stereotypes, uniqueness within and commonalities across groups (for detailed descriptions see Juang et al., 2020; Umaña-Taylor & Douglass, 2017).

In the *Identity Project* seminar, all the activities were either discussed or completed by the pre-service teachers themselves to learn more about their own ethnic-cultural identities and how to implement the activities with students. Discussions about pre-service teachers' own ethnic-cultural identity and their concerns for teaching in ethnic-culturally diverse classrooms offered opportunities to think in-depth about this aspect of their own and their students' identities and about how issues of ethnic-cultural diversity can be addressed in class. For a deeper understanding of the *Identity Project* activities and the impacts of migration, ethnicity and culture, theoretical input from education, psychology and sociology were provided (see supplemental materials). We included opportunities for self-reflections about the theoretical input, their own identity, and their role as future teachers. Through individual reflection questions and whole- and small- group discussions we engaged in guided discussions of ethnic and cultural diversity in society and in the classroom.

We emphasized experiential learning and opportunities for self-reflection and discussions (Civitillo et al., 2018) through pre-service teachers doing student activities themselves and sharing our experiences from implementing the *Identity Project* in high school classrooms, and we emphasized instructional practice (Miller et al., 2023) through discussing how students' ethnic-cultural identities can be included in teaching of different subjects and grades.

Through the *Identity Project* seminar, we promote three core components of CRT by providing opportunities to gain knowledge about cultural diversity and students' ethnic-cultural identities as resources, the need for more inclusive curricula that are relevant for students with different ethnic-cultural backgrounds, and developing and sustaining high achievement expectations for all students (Gay, 2002). With our mixed methods study, we contribute to addressing the methodological gap in assessing and evaluating the promotion of (pre-service) teachers' CRT self-efficacy (Civitillo et al., 2018).

### The current study

As an overarching research question, we tested whether the *Identity Project* seminar that guides pre-service teachers to reflect on their own and students' ethnic-cultural identities can promote pre-service teachers to become more culturally responsive. Cultural responsiveness was captured through measures of self-efficacy for teaching in ethnic-culturally diverse classrooms and general beliefs about teaching in ethnic-culturally diverse classrooms concerning students, teaching

content and teaching context. In the quantitative analysis, we examined whether pre-service teachers in the *Identity Project* seminar (intervention group) become more self-efficacious regarding CRT and develop more positive CRT-related beliefs. We expected the intervention group, compared to a control group that received standard, less applied seminars for teaching in diverse classrooms, to show more self-efficacy for teaching in culturally diverse classrooms (H1a) and more positive beliefs toward teaching culturally minoritized students and toward inclusion of ethnic-cultural diversity in class (H1b) from T1 (before the seminar started) to T2 (after the *Identity Project* sessions were completed). We expected the increased self-efficacy (H2a) and more positive beliefs (H2b) to be stable in T3 (after the seminar ended). In the qualitative analysis, we explored how CRT development of pre-service teachers in the intervention group is reflected in short written reflections on the seminar and how it informed their development as future teachers at T2 and T3 (EQ1). The study hypotheses for the quantitative analyses were pre-registered: https://osf.io/xj3dv/?view_only=98aada9209254116ba697c94823e7cc9

## Method

### Study design

Pre-service teachers were not randomly assigned but grouped into those who attended an *Identity Project* seminar (intervention) versus those who attended lectures or seminars on the topic of Teaching to Diverse Classrooms (control). In control and intervention classes, issues of teaching in culturally diverse classrooms were addressed. The major difference in how these two groups were taught is that through the *Identity Project*, experiential learning and ethnic-cultural identity development of students and themselves as well as self-reflection were emphasized much more actively in the intervention group. An a priori power analysis using G*Power3 (Faul et al., 2007) to test the difference between two independent group means using a two-tailed test, a small effect size (Cohen's $d$ = .26, Umaña-Taylor et al., 2018), and an alpha of .05, shows we needed 222 participants per group to adequately test for this effect at power = .90. Our pooled sample across four semesters thus gives us adequate power to detect small effects. The study was reviewed and approved by the first author's institutional ethics board (Application No. 73/2020).

We combined quantitative and qualitative methods in a convergent parallel design (Creswell & Plano Clark, 2011) to gather complementary data on developing CRT and for cross-validation of the methods. We collected online survey data in two independent strands, quantitative survey and qualitative open-ended questions, in the same study phase and then analyzed independently. The data consists of self-reported ratings for the quantitative strand and written reflections, categorized as brief texts (Robinson, 2022) for the qualitative strand. The surveys were conducted in week one of the seminar (T1), week ten after all eight *Identity Project* sessions were discussed (T2) and two months after seminar completion (T3). While quantitative data were collected at all three timepoints, qualitative data were collected at T2 and T3 and only from the intervention group, aiming toward an in-depth understanding of becoming culturally responsive through the *Identity Project* seminar. Results were merged into a joint interpretation and discussion.

### Participants and procedure

Our sample consists of 606 pre-service teachers ($n_{\text{intervention}}$ = 266, $M_{\text{age}}$ = 22.64 years, $SD$ = 3.55, 77% female,[3] 12% migration history[4]; $n_{\text{control}}$ = 340, $M_{\text{age}}$ = 23.88 years, $SD$ = 4.85, 82% female, 17% migration history). The sample reflects the gender and migration history distribution of pre-service teachers in Germany, where the majority are female, ranging from 66 to > 90%, depending on school track (German Federal Statistical Office, 2022a), and 13% have a migration history (German Federal Statistical Office, 2022b). Participants are bachelor students for teaching in primary or secondary schools from two main teacher training universities in Saxony-Anhalt and Brandenburg, both located in Eastern Germany. Data were collected from summer term 2020 to

winter term 2021/22, across four semesters with 11 intervention and 13 control classes and teaching periods of 14 weeks on average.

Due to the COVID-19 pandemic, both intervention and control classes were taught online with a combination of synchronous (online discussions) and asynchronous (e.g., recorded lectures) sections. In the asynchronous sections of the *Identity Project* seminar, relevant concepts and theories were explained in 25- to 45-minute recorded lectures and tasks for application, consolidation, and self-reflections of theoretical input and practical implications were assigned. The eight *Identity Project* sessions (i.e., the high school curriculum) were presented in the synchronous sections. The instructors of the courses also shared experiences in implementing the *Identity Project* with 7th and 8th graders. Pre-service teachers completed activities themselves and discussed contents and activities of *Identity Project* sessions in small groups or with the whole class. All three authors served as instructors and provided recorded lectures, so that pre-service teachers in the intervention group across both universities engaged with all three. The synchronous sections were led by a white, female professor in one university and co-led by two BIPOC[5] female lecturers (one professor and one PhD student) in the other university. The control group classes were taught by the same professors who taught the intervention group classes at their respective universities.

## Measures

### Quantitative data

The online questionnaires included questions about participants' university affiliation, demographics (gender, age, migration history) and social desirability (Kemper et al., 2012). We measured two broad dimensions of CRT, focusing on self-efficacy and general beliefs about teaching in ethnic-culturally diverse classrooms. For CRT self-efficacy, we captured beliefs about the self and about CRT practices. For general beliefs, we included beliefs about cultural content and knowledge, culturally diverse students, and cultural context and environment (Fives & Buehl, 2012; Gay, 2018). Group labels were adapted to consistently refer to "ethnic-cultural backgrounds/heritages," reflecting a terminology that is commonly used in Germany. Where necessary, measures were translated into German. For all measures, the Likert-type response scales ranged from "1 = No, that's not right" to "5 = Yes, that's right." Mean scores were computed for all scales such that higher scores reflected stronger agreement with the construct (see Table 1).

**Self-Efficacy – Interacting with Diverse Students** ($\alpha = .76$). Confidence for interactions with ethnic-culturally diverse students in a classroom includes four items (Tropp, 2017), e.g., "I feel confident in my skills to have successful interactions with diverse students with different ethnic-cultural backgrounds than my own."

**Self-Efficacy – Treating All Students Equally** ($\alpha = .68$). Confidence about treating students equally regardless of their ethnic-cultural background included three items (Tropp & Rucinski, 2022), e.g., "I am sure that students from other ethnic-cultural backgrounds feel that I am just as available to them as I am to students from my own background."

**Self-Efficacy – Engaging in Culture- and Ethnic-related Conversations** ($\alpha = .84$). Participants' self-efficacy with regard to conversations about ethnicity and culture in the classroom is assessed with four items (Tropp & Rucinski, 2022), e.g., "I feel confident in my ability to address cultural and ethnic issues as they arise in the classroom."

**Beliefs – Including Diversity in the Curriculum** ($\alpha = .61$). Beliefs toward inclusion of ethnic-cultural diversity in the curriculum were measured with four items (Dee & Henkin, 2002), e.g., "The perspective of a wide range of ethnic and cultural groups should be included in the curriculum." Two negatively worded items were reverse coded so that a higher score indicated greater importance of including diversity.

**Beliefs – Deficit Thinking About Students** ($\alpha = .72$). Negative beliefs about ethnic-cultural minoritized students were measured with three items (Fergus, 2016, 2017), e.g., "Our school would have fewer disciplinary issues if the problematic behaviors of students from cultural minorities were addressed in their home."

**Table 1.** Means, standard deviations, and analyses of covariances with repeated measures.

| Measure | Intervention | | Control | | F(1, 594) | p | η² |
|---|---|---|---|---|---|---|---|
| | M | SD | M | SD | | | |
| Confidence About Interacting with Diverse Students | | | | | **21.64** | **<.001** | **.035** |
| T1 | 3.94 | .57 | 4.09 | .52 | | | |
| T2 | 4.11 | .48 | 4.09 | .47 | | | |
| Confidence in Treating All Students Equally | | | | | 0.63 | .427 | .001 |
| T1 | 4.29 | .59 | 4.35 | .54 | | | |
| T2 | 4.33 | .45 | 4.31 | .47 | | | |
| Confidence in Engaging in Culture-/Ethnic-related Conversation | | | | | **5.76** | **.017** | **.010** |
| T1 | 3.94 | .67 | 4.03 | .60 | | | |
| T2 | 4.12 | .52 | 4.07 | .51 | | | |
| Importance of Including Diversity in the Curriculum | | | | | 3.77 | .053 | .006 |
| T1 | 4.19 | .51 | 4.18 | .53 | | | |
| T2 | 4.24 | .50 | 4.19 | .55 | | | |
| Deficit Thinking About Minoritized Students | | | | | 3.62 | .058 | .006 |
| T1 | 2.69 | .72 | 2.74 | .74 | | | |
| T2 | 2.58 | .68 | 2.73 | .68 | | | |
| Bias Awareness | | | | | 1.33 | .249 | .002 |
| T1 | 2.89 | .82 | 2.65 | .77 | | | |
| T2 | 2.92 | .69 | 2.79 | .66 | | | |
| Concern About Appearing Racist | | | | | 3.25 | .072 | .005 |
| T1 | 3.11 | .85 | 2.92 | .85 | | | |
| T2 | 3.08 | .74 | 2.93 | .79 | | | |

University affiliation, gender, migration history and social desirability at T1 were included as control variables. Significant time*group interactions are highlighted in bold.

**Beliefs – Bias Awareness** ($\alpha$ = .78). Awareness about own bias was measured with four items (Perry et al., 2015), e.g., "Even though I know it's not appropriate, I sometimes feel that I hold unconscious negative attitudes toward ethnic-cultural minorities."

**Beliefs – Concern About Appearing Racist** ($\alpha$ = .75). Concerns about being perceived as racist by others were measured using three items (Tropp & Rucinski, 2022), e.g., "If you are teaching in a class with students with ethnic-cultural backgrounds different from your own, to what extent are you concerned that students might think you are racist if you try to challenge their views?."

### Qualitative data

Qualitative data were collected from the intervention group, responding to open-ended questions in the same online survey for quantitative data. The questions were: *Cultural diversity is a topic about which there are many different attitudes and opinions in our society. 1) (How) Have your personal attitudes and opinions about cultural diversity changed through the seminar? 2) (How) Have your beliefs about dealing with cultural diversity in the classroom changed through the seminar? 3) How do you think the topics, activities, and discussions from the seminar will impact your future teaching?* The brief texts were analyzed through a structuring content analysis (Kuckartz & Rädiker, 2022; Schreier, 2012), using MAXQDA 2022 to explore how pre-service teachers perceived the *Identity Project* seminar as promoting culturally responsive teaching.

We expected that pre-service teachers would 1) share their own critical self-reflections as a consequence of challenging their beliefs, 2) mention activities and approaches for implementation from the seminar due to the theoretical and practical seminar input and 3) reflect on the development of skills and abilities for including ethnic-cultural diversity in their own teaching. These three aspects are discussed as important for becoming culturally responsive teachers in the literature in terms of "knowledge, action, and reflection" (Cabello & Burstein, 1995, p. 292). Consequently, we deductively developed the main categories of *self-reflection*, *CRT practices* and CRT *self-efficacy* as indicators for an increased CRT that pre-service teachers would elaborate on when answering the open-ended questions. All subcategories were developed inductively, of which some can be categorized as in-vivo

codes,[6] through re-reading and grouping segments coded within the same main category, with each subcategory being as distinct as possible from other subcategories. We included one mandatory subcategory, contradictory codings, that indicates a lack of self-reflection or self-efficacy or statements against CRT. By doing so, we provide a more nuanced picture of pre-service teachers' reflection.

## Results

### Quantitative findings

### Preliminary analyses

The intervention and control groups did not differ in distribution of gender ($\chi^2$ (1) = 3.11, $p$ = .078) and migration history ($\chi^2$ (1) = 3.83, $p$ = .050). They were unequally distributed regarding university affiliation ($\chi^2$ (1) = 243.80, $p$ < .001) such that 84% of pre-service teachers in the intervention group studied in Saxony Anhalt and 79% of pre-service teachers in the control group studied in Brandenburg. University affiliation, gender, migration history, and social desirability were entered as control variables in analyses.

To prevent bias in the analysis due to attrition (Asendorpf et al., 2014), we used Multiple Imputation (MI) in IBM SPSS 29 for our missing at random data. MI is considered a preferred method (Van Ginkel et al., 2020), even with data missing at random for up to 80% of missingness (Asendorpf et al., 2014). At T1, 16.5% were missing and at T2, 45.9% data were missing. With missing data of 81.5% at T3, we decided to exclude the follow-up data from our quantitative analysis. Consequently, testing of hypotheses H2a and H2b had to be abandoned. For MI of T1 and T2 data, we used 20 imputation iterations at the scale level. We considered the iterations based on the proportion of missing data (usually more iterations are suggested) and the risk of a power falloff (too many iterations are problematic) (see Graham et al., 2007), and pooled data in a separate step.[7] We included the control variables (university affiliation, gender, migration history, and social desirability) and, as recommended for longitudinal data, the main scales at both timepoints T1 and T2 in the imputation model (Graham et al., 2007).

### Descriptives

The descriptive statistics are depicted in Table 1. Both intervention and control groups report high levels ($M \geq 3.94$) of confidence for interacting with ethnic-culturally diverse students, treating all students equally, engaging in culture- and ethnic-related conversations in class and promoting inclusive curricula at T1 and T2. They report medium levels ($M \geq 2.58$ and $\leq 3.11$) for negative beliefs about minoritized students, concerns of being perceived as racist, and bias awareness. Bivariate correlations per condition for T1 and T2 with small to medium effect sizes (see Tables 2 and 3) show positive correlations of all self-efficacy scales with each other. Participants' beliefs about their bias awareness and their concern for appearing racist are positively related with each other, but negatively with the self-efficacy scales. Deficit thinking and beliefs about inclusive curricula as important are negatively related with each other. Finally, perceiving inclusive curricula as important is positively correlated with confidence in engaging in culture- and ethnic-related conversations in class.

### Main analyses

Data were analyzed in a two-step process.[8] First, mean level differences of the intervention and control groups at T1 were examined through independent t-tests. The intervention and control groups did not differ on confidence about treating all students equally ($t(604) = 1.12$, $p$ = .262), engaging in culture- and ethnic-related discussions in class, ($t(604) = 1.73$, $p$ = .085), the importance of inclusive curricula ($t(604) = -.17$, $p$ = .863) and negative beliefs about minoritized students ($t(604) = .85$, $p$ = .394). They differed regarding their concern of being perceived as racist ($t(604) = -2.64$, $p$ = .009) (intervention

**Table 2.** Bivariate correlations for study variables per group (intervention or control) at pre-test (T1).

| Variable | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| 1 Confidence About Interacting with Diverse Students | — | .419** | .465** | .262** | −.086 | −.323** | −.337** | .187** |
| 2 Confidence in Treating all Students Equally | .447** | — | .308** | .135* | −.037 | −.441** | −.276** | .346** |
| 3 Confidence in Engaging About Culture- and Ethnic-related Conversations | .519** | .394** | — | .230** | −.048 | −.223** | −.179** | .203** |
| 4 Importance of Including Diversity in the Curriculum | .177** | .133* | .258** | — | −.325** | .020 | .061 | .085 |
| 5 Deficit Thinking About Students | −.164** | −.108 | −.083 | −.254** | — | .042 | .043 | −.057 |
| 6 Bias Awareness | −.297** | −.425** | −.264** | .054 | .103 | — | .379** | −.301** |
| 7 Concern About Appearing Racist | −404** | −.286** | −.240** | −.054 | .150* | .430** | — | −.141** |
| 8 Social Desirability [a] | .190** | .339** | .247** | .051 | −.064 | −.483** | −.259** | — |

Variables 1 to 3 address CRT-related self-efficacy. Variables 4 to 7 capture beliefs about teaching in ethnic-culturally diverse classrooms. Variable 8 is a control variable. Intervention group below diagonal and control group above diagonal.
[a]Social Desirability was stable from T1 to T2 in both groups. Thus, we only included T1 social desirability in the ANCOVA with repeated measures.
*$p < .05$, **$p < .01$.

**Table 3.** Bivariate correlations for study variables per group (intervention or control) at post-test (T2).

| Variable | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| 1 Confidence About Interacting with Diverse Students | — | .533** | .580** | .296** | −.053 | −.326** | −.357** | .265** |
| 2 Confidence in Treating all Students Equally | .503** | — | .429** | .213** | .060 | −.392** | −.343** | .480** |
| 3 Confidence in Engaging About Culture- and Ethnic-related Conversations | .611** | .464** | — | .351** | −.036 | −.198** | −.169** | .266** |
| 4 Importance of Including Diversity in the Curriculum | .335** | .086 | .456** | — | −.507** | .016 | −.001 | .214** |
| 5 Deficit Thinking About Students | −.212** | .046 | −.194** | −.430** | — | .022 | .033 | −.075 |
| 6 Bias Awareness | −.211** | −.415** | −.207** | .022 | .178** | — | .486** | −.316** |
| 7 Concern About Appearing Racist | −.177** | −.285** | −.123* | −.083 | .082 | .577** | — | −.155** |
| 8 Social Desirability[a] | .338** | .388** | .321** | .208** | −.155* | −.416** | −.216** | — |

Variables 1 to 3 address CRT-related self-efficacy. Variables 4 to 7 capture beliefs about teaching in ethnic-culturally diverse classrooms. Variable 8 is a control variable. Intervention group below diagonal and control group above diagonal.
[a]Social Desirability was stable from T1 to T2 in both groups. Thus, we only included T1 social desirability in the ANCOVA with repeated measures.
*$p < .05$, **$p < .01$.

group higher), confidence for interacting with ethnic-culturally diverse students ($t(604) = 3.31$, $p = .001$) (intervention group lower) and bias awareness ($t(604) = −3.58$, $p < .001$) (intervention group higher). Second, we used analysis of covariances (ANCOVA) with repeated measures, including T1 and T2, for each of the outcome variables separately. We were interested in the effects of the independent variable (condition: intervention or control) on the dependent variables while controlling for university affiliation, gender, migration history, and social desirability. To test H1a and H1b, the time*group interactions showed just two significant effects for confidence for interacting with diverse students ($p < .001$, $\eta^2 = .035$) and for engaging in culture- and ethnic-related conversations ($p = .017$, $\eta^2 = .010$). For the intervention group but not control group there were significant increases with small effect sizes (see Table 1). For all other variables and in contrast to our hypotheses, the intervention and control group did not differ in how they changed over time. Analyses also showed that for both groups there was an increase over time for bias awareness ($F(1, 594) = 8.74$, $p = .003$, $\eta^2 = .014$).

## Qualitative findings

To address EQ1, we analyzed the brief texts from the intervention group ($n_{T2} = 103$; $n_{T3} = 73$), developed a category system with main- and subcategories using a hybrid, deductive-inductive approach and coded based on a seven-phase model (Kuckartz & Rädiker, 2022; see supplemental

materials for a detailed description of the seven-phases for coding for this study). The inter-coder-reliability of the final coding process was assessed through MAXQDA. With a Kappa of .81 (95% confidence interval), this is interpreted as good agreement (Brennan & Prediger, 1981; Von Eye, 2006). All quotes reported here are translated from German to English. Overall, when comparing the main category coding distributions, at T2, 37% of segments[9] were coded as *self-reflection*, 37% as *CRT practices*, and 26% as *self-efficacy*. At T3, 30% of segments were coded as *self-reflection*, 42% as *CRT practices*, and 28% as *self-efficacy*. For the main category of *self-reflection* there were eight subcategories, for *CRT practices* there were 11 subcategories and for *self-efficacy* there were seven subcategories. Examples and the number of coded segments per main- and subcategories can be found in the supplemental online materials. Due to the high attrition of study participants at T3, we will not report and interpret our qualitative findings separately for T2 and T3. Instead, we use the data to get a general understanding of pre-service teachers' CRT development during and after the *Identity Project* seminar.

### Self-reflection during and after the *Identity Project* seminar

Participants appreciated exploring and reflecting about cultural diversity and family heritage identities in particular. Those statements were coded as *Critical reflection of own opinions, attitudes, behavior*. For example, a participant wrote "I noticed that I consciously try to be more open-minded and less biased towards people from other ethnic backgrounds in everyday situations (which unconsciously may have happened before)," indicating bias awareness and (unconscious) negative beliefs about outgroups. A few participants expressed they achieved a clearer sense of responsibility as teachers to addressing inequities and promoting equity, captured in the subcategory *Understanding one's own role as a teacher*. A person wrote "The content of the seminar made me aware of how important it is for me as a teacher to be sensitive and competent with regard to cultural diversity. It is important for me that now I can identify discrimination and racism as such and I want to ensure that they are prevented." Hence, this participant mentions the relevance of treating all students equally as something to aim for, which is also captured as a scale in the quantitative strand.

Some pre-service teachers expressed cultural diversity to be "more complex than previously thought" and although a participant "already believed that cultural diversity is something that should be valued and respected [. . .] the seminar made [them] even more aware of the hurdles/difficulties this topic can entail and how important it is to deal with it in a conscious way." Those statements were grouped into *Recognizing the complexity of cultural diversity*. They also shared *Learning about one's own (cultural) identity*, e.g. expressed as "I myself have realized that it is really important to clarify what my own identity and heritage is and what it captures," while others benefitted from being "enriched through many different perspectives," coded as *Opening up new perspectives*. Many described a sharpened awareness for issues of cultural diversity, as in "Prior to the seminar, the topic was barely present in my life. Now I know that it is very likely that I have to deal with this topic in my professional career," captured as *Recognizing the relevance of cultural diversity*. Other participants described the *Sensitizing for cultural diversity*, e.g. "Through the seminar, important topics were discussed. I think that I am even more sensitized through that and that this will in turn affect my future teaching."

Overall, pre-service teachers shared how they grew more conscious and self-critical about how they thought about ethnic-cultural diversity after the seminar and that they perceived themselves as agents of change. Some pre-service teachers learned more about their own ethnic-cultural identities, while others benefitted from hearing about new perspectives or sharpened their awareness for issues of cultural diversity. Also, through opportunities for self-reflection, they learned about how family heritage identities can be important and potential resources for students. Further, some became aware of potential pitfalls and hurdles when teaching in ethnic-culturally diverse classes and about ethnic-cultural related topics, with the aim to address cultural diversity in a conscious and competent way.

## CRT practices during and after the *Identity Project* seminar

Participants reported thinking about concrete practices and beliefs in line with the CRT framework. The most frequent code is acknowledging *Cultural diversity as relevant for one's own teaching*, which was described, for example, in "I think I have once again become more aware of the importance of the topics. As a consequence, I will probably think more often and more actively about how I can incorporate the topics, activities and discussions into lessons." Pre-service teachers also expressed *Critiquing problematic approaches*. For instance, a participant said „I particularly remembered the difference between colorblindness and multiculturalism. The approach to not ‚notice' skin color, for example, seemed reasonable to me and as promoting equality. However, I realized that this denies racism and discrimination. Instead, it is more interesting to acknowledge that everyone has a different cultural heritage and that this is relevant for the individual identity." The subcategory *Recognizing, addressing and reducing injustice* was developed, based on statements such as "The seminar made me aware of how omnipresent the problem of discrimination and inequality still is today. At the same time, I realized how important it is to address these issues." Related to that, the subcategory *Reflecting on one's own teaching* emerged and is, for example, expressed in "[…] the importance of reflecting my own actions and thoughts […] in order to improve my future teaching." Others show CRT development through planning to select teaching materials that represent cultural diversity, e.g. "I will definitely chose materials more often that show cultural diversity more or less clearly", or adapting lessons by providing opportunities for students' different perspectives and experiences, e.g. "[…] I realized that providing space for children's experiences and opinions in the classroom can be very fruitful", and were grouped into *Including students' perspectives/identities in class*. This aligns with findings from the quantitative data, showing that participants who perceive including diversity in the curricula as important are more likely to engage in culture- and ethnic-related conversations in class.

Interestingly, many pre-service teachers mentioned "It may be possible to address cultural differences in some kind of a project week and explore the students' backgrounds in detail there" and were coded as *Including diversity in selected subjects and settings*. Only a few participants highlight the *Universal importance of cultural diversity (across subjects and particular settings)*, for instance verbalized as „I will consciously address the topic diversity, regardless of the cultural diversity in class" or „I think across subjects, all of us are confronted with the topic [of cultural diversity]." Many underlined they more strongly perceived *Cultural diversity as a resource* after attending the seminar, e.g. "[…] Through sharing and learning about the topic from and with each other, everyone's well-being in class and school can be improved." Others aimed toward *Sensitizing of students for cultural diversity*, for instance saying that "Raising awareness of all students has become more important" to them. *Creating a comfortable learning environment for all students* was also mentioned, e.g. indicated by "[…] In the classroom, I want to be open to everyone and use the inspiration from the seminar to create an atmosphere in which everyone feels accepted and comfortable" and „I want to give every child the opportunity to be able to follow my lessons and feel comfortable in the classroom".

In sum, the majority of pre-service teachers' codes indicated a move toward more CRT. Pre-service teachers reflected about inappropriate approaches for teaching in ethnic-culturally diverse classrooms and mentioned concrete practices, strategies, and adaptions for their (intended implementation of) teaching lessons, to enable all students to learn properly.

## CRT self-efficacy during and after the *Identity Project* seminar

Self-efficacy is expressed directly, through the subcategory of *Perceived competence and confidence*. Pre-service teachers shared how they gained arguments, a sharpened perception of discrimination and feel „[…] ready and prepared, and in a way even obliged to introduce and guide through those topics"or „Now I do trust myself to address many things that I would have asked for help with or been very unsure about before." Other participants highlighted how they were *Gaining practical knowledge and opportunities for action*, as expressed in "Good exercises, tasks, etc. to deal with [cultural diversity] in class. Took away my fears of misbehavior etc." and "Practically, I also learned about opportunities for action." A person explained "I have always been a big advocate for cultural diversity and have been

tackling my own (subconscious) prejudices for a while, I try to be anti-racist. This seminar supports me in this and has helped me a lot to learn theoretical approaches that back me up in my views," indicating *Gaining theoretical knowledge*.

Self-efficacy was also described indirectly through their *Motivation to address the topics in their own teaching*. For example, a participant wrote that „They [the topics and contents in the seminar] will have a great impact on my teaching because I will be paying more attention to them, and I will include and address these topics in my own lessons." Others shared they "will implement the project" or certain parts of the project and were coded as *Motivation to implement the Identity Project or selected sessions or activities*. A few participants described *Positive feelings about teaching in class with/about cultural diversity*, e.g. "It will bring joy to teach these topics" or "I enjoyed getting to know my own identity and other cultures etc. in a playful way. If it was fun for me, then it will be even more fun for the primary school students." The subcategories of *Perceived competence and confidence* and *Motivation to address the topics in their own teaching* represent the most frequent codes, followed by *Practical knowledge and opportunities for action*. However, some statements without further explanations as "I was able to gain more confidence" (in what exactly?) or "I hope that my future students can benefit from it" (from what? In what way?) were not as specific, and it is not always clear what the person refers to.

Overall, pre-service teachers perceived themselves as more competent and confident teaching in ethnic-culturally diverse classrooms and about ethnic-culture-migration-related topics after attending the seminar. This was expressed in various ways such as feeling prepared to implement *Identity Project* activities and being motivated to address seminar topics like ethnic-cultural identities in the classroom. Some explicitly mentioned gaining confidence and competence as they participated and learned from experiencing *Identity Project* activities firsthand.

### *Capturing differentiated impressions of CRT development during and after the Identity Project seminar*

We did find examples in participants' brief texts, which were coded as contradictory to *CRT practices* and *CRT self-efficacy*. Related to the main category of CRT practices, a few participants described the seminar to not have had any impact. Other participants shared unintended, problematic approaches they want to implement in their teaching, such as assimilation, for example: „My attitudes have changed in the sense that I used to believe that every heritage should be considered. Yet this is what causes exclusion in some cases. Instead, I should conduct my teaching more general and German, so that migrants can learn about the target culture and also acquire it." Contradictory to *CRT self-efficacy*, a few participants described negative emotions, like feeling overwhelmed, insecure or afraid to make mistakes. One participant stated „Honestly, I have to say that I've only become more aware of how big this minefield around culture is. In fact, I might almost feel more insecure than I did before, where I didn't even think about it. Nevertheless, I think it's just as important for us as teachers to be more sensitive and conscious about it." This example illustrates the negative relation found in the quantitative measures where concerns of appearing racist were related to lower self-efficacy. It also shows that pre-service teachers have just started thinking about "culture." Others were skeptical about whether the knowledge, activities and skills from the *Identity Project* seminar could indeed be „transferred into everyday school life."

### Discussion

The purpose of the study was to examine whether an applied seminar based on the *Identity Project* could foster the development of CRT among pre-service teachers by centering critical reflections of their own and students' ethnic-cultural identities. We assumed that engaging in concrete *Identity Project* activities, as experiential learning, combined with opportunities for self-reflections would promote CRT self-efficacy and positive beliefs about teaching in ethnic-culturally diverse classrooms. We also assumed that CRT development would show in short written reflections. By adopting a mixed

methods approach, we captured a nuanced assessment of becoming more culturally responsive through applied teacher trainings.

## Efficacy of the *Identity Project* seminar

In contrast to our hypotheses, pre-service teachers in the *Identity Project* seminar (intervention group) did not differ from the control group in their mean-level changes across time regarding confidence in treating all students equally, beliefs in the importance of including diversity in the curriculum, deficit thinking about minoritized students, bias awareness, and concern for appearing racist. The control group was a class on Teaching to Diverse Classrooms. Because there was also an emphasis on the importance of diversity for culturally sensitive teaching, this may have also prompted similar reflections and thus minimized differences between the two groups. Indeed, we found that both the intervention and control groups increased in bias awareness across the semester, which is encouraging.

We did find, however, that, participants in the intervention group became more confident for interacting with ethnic-culturally diverse students and engaging in culture- and ethnic-related conversations than those in the control group. Pre-service teachers in the intervention group were provided with a concrete curriculum that emphasized experiential learning, self-reflection, and ethnic-cultural identity development of students. Our findings suggest that the seminar's in-depth focus on pre-service teachers' own and their students' ethnic-cultural identities promoted CRT more so than a standard seminar about diversity.

The emphasis on identities and lived experiences to promote educational equity are the cornerstone of CRT (Gay, 2002). We assume that pre-service teachers' CRT self-efficacy was particularly prompted through including their own ethnic-cultural identities in the seminar. They were encouraged to think about what their own ethnic-cultural identity is, how they feel about it (private regard), how it is perceived by others (public regard) and in which situations they felt privileged or disadvantaged and excluded based on their ethnic-cultural group belonging. This may have been helpful to become aware of their own lived experiences and how these can be different from the lived experiences of others. Understanding challenges and privileges students face based on their minoritized and majorized identities is important to comprehend why the ethnic-cultural identities of *all* students should be included in class to promote equity (Banks, 2015; Gay, 2018). In the seminar, we strongly highlighted that ethnic-cultural identities are potential resources for students, and marginalized students in particular, and shared how students' ethnic-cultural identities can be considered in class. According to our interpretation, pre-service teachers became more motivated to engage in conversations about ethnicity and culture and have positive interactions with students in ethnic-culturally diverse classrooms through understanding how important it is to include students' (different and diverse) ethnic-cultural identities in their teaching to promote equity and how this can be implemented.

### *Processing new information and emotions to become culturally responsive teachers*

In addition to the main findings, the bivariate correlations provide clues as to why the *Identity Project* seminar may increase CRT self-efficacy. Bias awareness and fear of appearing racist were positively correlated. This makes sense as being confronted with unconscious bias and potential pitfalls regarding teaching in ethnic-culturally diverse classrooms may trigger pre-service teachers' fear of making a misstep with students. This fear of making a misstep or being perceived as racist may subsequently lower CRT self-efficacy. The bivariate correlations show that indeed, bias awareness and fears of appearing racist are both negatively correlated with CRT self-efficacy. Tropp and Rucinski's (2022) study of teachers in the U.S. found that teachers' fears of appearing racist, but not their implicit biases, predict low CRT self-efficacy and being less likely to engage in conversations about ethnicity and race in class. Hölscher et al.'s (2024) study of teachers in Germany also found that fears of appearing racist predict

lower CRT self-efficacy and higher cultural diversity stress. Consequently, teacher trainings should go beyond raising participants' awareness for their implicit or explicit bias and include discussions that target their fears to grapple with and move beyond negative emotions. These negative emotions may initially lower CRT self-efficacy. We argue that these fears and concerns, however, can be overcome. By providing the space and opportunities to express their concerns and practice engaging in ethnicity- and race-related discussions with their students, pre-service teachers can confront these negative emotions to move forward and develop more CRT self-efficacy. Seminars should therefore consider that this process of overcoming fears while becoming more self-critical and critically conscious needs time. It requires a seminar climate that allows pre-service teachers to openly share their concerns and discuss opportunities and obstacles to successful behavior and interactions in class.

## Understanding CRT development in *Identity Project* seminar participants

The analysis of brief texts of pre-service teachers in the seminar allowed us to examine EQ1 and provide richness through "the diversity of responses rather than the depth of responses" (Robinson, 2022, p. 17). The open-ended questions required in-depth thinking about how their beliefs changed during and after the *Identity Project* seminar and possible implications for their future teaching. Participants expressed how they reflected on their own biases and beliefs about ethnic-cultural diversity, which is important for becoming culturally responsive teachers (Dovidio et al., 2016; Kyles & Olafson, 2008). Many of them also mention concrete practices for CRT, e.g., including students' ethnic-cultural identity when planning lessons, which is one of the main goals of CRT (see Byrd, 2016; Gay, 2018; Siwatu, 2007). Moreover, many shared boosts of confidence and competence for teaching in ethnic-culturally diverse classrooms, or at least were motivated to implement activities from the *Identity Project* and discuss topics they perceived as difficult to discuss before the seminar. These positive beliefs about their own abilities are essential to bring their knowledge and skills into action (Bandura, 1977; Siwatu, 2007). Overall, the codings (and small number of contradictory examples, see supplemental materials) for pre-service teachers' self-reflections, CRT practices and CRT self-efficacy, show the effectiveness of the *Identity Project* seminar on pre-service teachers' development.

In addition, the inductive development and coding process of subcategories enabled us to identify important components of CRT in the written reflections of *Identity Project* seminar participants (e.g. "Critical reflection of own opinions, attitudes, behavior," "Including students' perspectives/identities in class" and "Creating a comfortable learning atmosphere for all students"). By also coding for segments that are contradictory to CRT development in the qualitative data, persisting challenges for some pre-service teachers as future culturally responsive teachers became visible. When pre-service teachers from the *Identity Project* seminars shared feeling insecure or overwhelmed because of the complexity of the discussed topics and potential pitfalls for teaching in ethnic-culturally diverse classrooms, this allows us to better understand the process of *becoming* a teacher who is confident with CRT. This developmental process is described as "an ongoing, long-term, and often discomfiting process" (Weinstein et al., 2003, p. 269; see also Alhanachi et al., 2021). Additionally, some pre-service teachers expressed their doubts about the transfer of knowledge and skills from the seminar to their actual teaching practice and requirements in everyday school life. This theory-to-practice gap is also described in other studies (e.g., Siwatu, 2011; Stepp & Brown, 2021).

## Reflections on the promotion of CRT through the *Identity Project* seminar

Our mixed methods findings support previous studies showing that after trainings, teachers became more culturally responsive in some but not all CRT domains (Malo-Juvera et al., 2018; Siwatu, 2007, 2011) and do not express radical shifts of beliefs, attitudes and behaviors (Cabello & Burstein, 1995).

Our effects particularly target the teacher-student-relationship, similar to findings from Siwatu (2007). We also see similarities of our findings to other mixed methods studies that report seminar effects on pre-service teachers in their qualitative analysis, but much less so in their quantitative analysis (e.g., Kyles & Olafson, 2008).

Through the qualitative strand, we assessed pre-service teachers' (in the intervention group) motivation to include their students' ethnic-cultural identities, critically reflect on their own biases and feel more prepared and competent to teach in ethnic-culturally diverse classrooms. Perceiving themselves as more competent may prevent avoidance of meaningful discussions about ethnic-cultural identities and adaptions of learning content and instructions to their students. Instead, we hope to have supported pre-service teachers to incorporate critical self-reflections, awareness for ethnic-cultural related topics, and include students' lived realities into their teaching from the very beginning of their careers.

Moreover, we assume that trajectories of intervention and control group would be more distinct after more time has passed and with quantitative T3 data included in the analysis. A longitudinal study of the *Identity Project* finds a sleeper effect for the ethnic-racial identity resolution of white youth who may have required a longer time period (compared to minoritized youth) to process the exploration of their ethnic-racialized identities (Sladek et al., 2021). As the majority of our study sample consists of pre-service teachers racialized as white and without migration history, we assume that much of the seminar content, the discussions and the examples from working with marginalized students were new to many of them. The complexity of the topics or concern about making mistakes (both show in the qualitative data) or being perceived as racist (addressed in the quantitative data) could be a first important step toward becoming more aware of cultural responsiveness. With time, however, the pre-service teachers may continue to learn more about these topics and finally, become more self-efficacious regarding CRT.

### *Limitations and directions for future research*

Our study contributes to field by centering ethnic-cultural identities as a way to promote the development of CRT. However, it contains limitations. One limitation is the high attrition at T3. The study was conducted during the COVID-19 pandemic from 2020–2022 and pre-service teachers had to adapt to new regulations (e.g., online classes, less contact and networking with fellow students, less mentoring, more independent learning). Some were confronted with financial, health and mental load struggles that could have hindered them from participating in another survey, especially after the seminar ended (at T3). Besides, in-person classes allowing for face-to-face conversations while implementing *Identity Project* activities and discussing topics could have enhanced participation.

Some factors were beyond our control, such as the ethnic-cultural identity of the lecturers, whether participants in the control group attended a larger lecture vs. a smaller seminar, and the enrollment of pre-service teachers in the classes of the two universities. To address the limitation of non-randomization across intervention and control group, we controlled for university affiliation in our quantitative analysis. Trainer effects are limited as intervention classes at both universities and the control classes at the university in Brandenburg were taught by the same lecturers.

We initially planned to take pre-service teachers from the intervention group to multicultural schools to either observe or co-moderate selected activities from the *Identity Project* sessions, and thus provide opportunities for vicarious and mastery experiences (Bandura, 1977; Siwatu, 2011). This could not be implemented due to the pandemic. We argue that this would have strengthened the effects of the intervention, as we would have even more strongly targeted a) the relevant component of experiential learning (Civitillo et al., 2018), b) contact through multicultural school settings (Miller et al., 2023) and could have c) included observations of pre-service teachers in our study (Miller et al., 2023; Stepp & Brown, 2021). Future research studies with pre-service teachers conducted in their transitions from university into their first teaching career years (see Ulbricht et al., 2024) and studies including both teacher and student outcomes of CRT are needed.

## Conclusion

Our mixed methods study showed a nuanced picture of the effects of an applied seminar to promote pre-service teachers in their CRT development. The *Identity Project* seminar can be an important starting point for pre-service teachers to engage with the topics related to ethnic-cultural diversity and related identities. Compared to the control group, pre-service teachers in the intervention classes with the *Identity Project* seminar showed increases in their CRT related self-efficacy, becoming more confident for interactions with ethnic-culturally diverse students and engaging in culture- and ethnic-related conversations. In their short written texts, pre-service teachers that participated in the *Identity Project* seminar expressed awareness for CRT. They critically reflected about their own unconscious biases, were motivated to address seminar topics in their own teaching, and felt more competent to implement CRT-related practices such as considering students' ethnic-cultural identities in their learning and classroom experiences. We argue that centering both students' and pre-service teachers' identities is an important first step to prepare pre-service teachers for teaching in culturally responsive ways in the future.

## Notes

1. In US research, the terms ethnic-racial, ethnic or racial identity are predominantly used. In Europe, the terminology of "race" is problematized and, sometimes, uncritically replaced by ethnicity or culture (Juang et al., 2021; Jugert et al., 2022). In this study, we use ethnic-cultural identity to capture family heritage (referred to as ethnicity) and national (e.g. German) identity as both are relevant for students' cultural identity. We want to highlight racialization as important for identity development, although that is not as directly captured in the adaptations for the European context and are transparent when we refer to racial identity, e.g. when citing US research that clearly addresses racialization.
2. Through using the term of historically marginalized or minoritized groups (American Psychological Association, 2023), we address the historical component of inequity and exclusion of some ethnic-cultural-racial groups due to white supremacy and racism, with extensive consequences that persist. We are aware of other forms of marginalizations, which are not addressed in this study.
3. Across the whole sample, four teacher students chose the category „diverse". Due to data privacy issues and too few numbers to create a separate group, gender of these students was coded as missing.
4. Either the person immigrated to Germany themselves, had at least one parent who was born outside of Germany or has a citizenship other than German.
5. Black, Indigenous or Person of Color.
6. Inductively developed codes that use words and terminology used by the participant(s) themselves (see Kuckartz & Rädiker, 2022, pp. 57, 89).
7. For robustness checks, we repeated the analysis with 1) the original unimputed data and 2) with an imputed dataset based on 10 iterations. The results were similar to those reported in the text.
8. Two-tailed *p*-values are reported.
9. Single sentences or paragraphs that can be assigned to one subcategory only (see mutual exclusiveness in Schreier, 2012).

## Disclosure statement

No potential conflict of interest was reported by the author(s).

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## Data availability statement

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

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