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Research paper

Professional development in multicultural education: What can we learn from the Australian context?

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HIGHLIGHTS

- The role of professional development on teachers' multicultural attitudes and beliefs were examined.
- Two types of professional development were distinguished: Multicultural Education and English as a Second Language (ESL).
- Both types of professional development were associated with more positive beliefs about multicultural practices.
- Only professional development in ESL was associated with more positive multicultural attitudes.
- The most effective time to receive professional development is during in-service years.

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ABSTRACT

Including data from 3006 in-service primary and secondary public-school teachers in New South Wales, we investigated the effects of professional development in multicultural education on teachers' beliefs about the effectiveness of multicultural strategies in fostering a culturally inclusive environment, the importance of these strategies in providing equitable opportunities for students, and the teachers' support for monocultural ideologies and practices. Our multilevel structural equation model showed that teachers who received professional development, especially during their in-service years, had more positive attitudes and beliefs about multicultural ideologies and practices compared to teachers who did not undergo professional development.
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1. Professional development in multicultural education: what can we learn from the Australian context?

The demographic profiles of classrooms in many parts of the world are becoming more diverse due to the high levels of forced and voluntary migration (Beutel & Tangen, 2018). This poses significant challenges to teachers worldwide. Signaled by the academic achievement gap between cultural, ethnic, and linguistic minority and majority students, high dropout rates and over-representation of minorities in lower academic tracks in most of the Western world[1] (Reagan & Hambacher, 2021), high rates of reported stigmatization and discrimination by minorities, and disproportionate use of disciplinary methods (Schuchart, Glock, & Dunkake, 2021), education systems and educators still need to make progress in fulfilling the demands of culturally diverse classrooms.

Teachers, however, cannot be expected to effectively accommodate diversity in their classrooms without being professionally prepared for it. Indeed, teachers continue to report a lack of professional confidence in responding to diversity, which is suggested to be a direct reflection of the lack of education for cultural diversity in teachers' professional development (Forghani-Arani, Cerna, & Bannon, 2019). The current study examined the extent to which investing in such professional learning opportunities could influence public school teachers' approach to diversity and therefore potentially improve their performance in accommodating students

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[1] With the exception of many minority students with migration history from Asian countries such as India and China (Watkins & Noble, 2013).

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from diverse backgrounds.

1.1. Accommodating diversity

By and large, students from different cultural, ethnic, and linguistic minority groups still continue to differ in their educational outcomes (Parkhouse, Lu, & Massaro, 2019). In European countries such as Germany and the Netherlands, the educational achievements of students from migrant backgrounds from countries like Turkey and Morocco (Weiner, 2016); in the U.S, African-American, American Indian, and Latinx students (Reagan & Hambacher, 2021); in Australia, students with Middle Eastern and Aboriginal heritage lag behind those of their majority group peers (Noble & Watkins, 2014).

There are many possible explanations for this achievement gap, varying from the segregation of schools along ethnic or "racial" lines in Europe and the U.S., the socio-economic background of children from minority groups, and the resulting decreased access to educational resources, a mismatch between the home and school culture, as well as experiences of stereotyping, prejudice, and discrimination (Leath, Mathews, Harrison, & Chavous, 2019). These are all aspects of intergroup bias, in which members of other groups (mostly minority groups) are attributed generalized characteristics (stereotypes), are prone to be evaluated negatively (prejudice), or are the victim of negative actions (discrimination) (Dovidio, Hewstone, Glick, & Esses, 2010).

One crucial element in both increasing and decreasing differences in achievement by different groups are the teachers. They are not only responsible for learning materials and instruction, but they also serve as role models and set the tone for their classroom's climate. The teaching workforce in Europe, in the U.S., and in Australia is, however, still largely dominated by teachers from majority groups (Forrest, Lean, & Dunn, 2017). The disparity between increasing student diversity and the limited cultural diversity of the teaching workforce may result in an oversight of the above-described experiences of some students from minority groups that may contribute to their unfavorable educational position. Despite efforts to better educate teachers, the availability of suitable resources for empowering teachers in accommodating diversity is still limited. As a result of the unfamiliarity of many teachers regarding matters of cultural diversity, a colorblind approach to diversity has often been prevalent in classrooms, implying that characteristics and consequences of group membership are deemphasized. Many teachers adopt such an approach with the intention to increase equality and positive intergroup relations (Gay, 2018) or, alternatively, to avoid appearing biased (Apfelbaum, Pauker, Ambady, Sommers, & Norton, 2008). Notwithstanding teachers' good intentions, this approach not only ignores the realities of some students' lives, but it may also increase the problems they experience. Not acknowledging the obstacles the students from minority groups face, such as racism and unequal access to resources, may lead to unsubstantiated attribution of persistent lower achievement of these students to a lower intellectual competence (Urias, 2006), which in turn further contributes to the reproduction of inequalities (Adams, 2007).

It is well known that teachers have a crucial role in students' experiences and opportunities in their school trajectories (Gay, 2018); therefore, the impact of teachers' approaches to diversity can be large. Teachers are therefore expected to have a certain level of diversity literacy, allyship, and capacity in order to respond to the varying backgrounds of their students.

1.2. Teachers' competence in responding to diversity

Within the education for social justice literature, there are numerous, overlapping discourses with a similar vision of creating environments that empower students from marginalized groups and challenging inequitable structures. (Hytten & Bettez, 2011). Although a degree of uncertainty surrounds the specific strategies and practices emerging from the interconnected discourses, teachers' effective response to diversity commonly includes an inquiry on their students' possibly different manners and preferences of communicating and learning, educating oneself about the lives and experiences of their students, identifying sources of inequality and striving for fairness, and a continuous assessment and recognition of others' and their own cultural frames of reference and potential biases (e.g., Banks, 1981; Bennett, 1993; Boyle-Baise & Gillette, 1998; González et al., 1995; Nieto & Rolón, 1997; Sleeter, 1992; Villegas, 1991).

Severiens, Wolff, and van Herpen (2014) lay out in their review what form effective response to diversity should take in concrete classroom situations. They report that teachers should have positive 'multicultural' attitudes, that is, that they consider diversity as a valuable source of learning and are comfortable with discussing diversity issues (Ponterotto, Baluch, Greig, & Rivera, 1998). Moreover, they should actively counteract racism and promote positive relationships; use different instruction methods and perspectives to make learning relevant for a diverse student body; build on their students' existing cultural resources; and, reflect on how knowledge is constructed from the perspective of the advantaged group (Banks, 2016). Furthermore, teachers should attempt to improve parental involvement, and are aware of certain processes that take place daily and can affect students' academic and social identity development (e.g., stereotyping, teacher expectations; Severiens et al., 2014).

Another factor in accommodating diversity that has received attention in the literature is language development of students. The language of instruction is both an end and a medium for students who are educated in a language other than the language(s) spoken at home. Accordingly, teaching in an additional language requires the teacher's competence to build on students' knowledge of the host language as well as their acquired knowledge of the world in their first language, as they will use both of these resources during their additional language comprehension (Lo Bianco & Slaughter, 2009). These students not only have to learn the subject matter, but also the language of instruction (Hu & Gao, 2021). This can limit their access to the educational content and ability to reproduce this in the oral and written forms of academic language (Burr, 2018). Students' comprehension of an additional language can be shaped by their first language that previously was their source of knowledge of the world and allowed them to form identities. Thus, teachers should pay attention to the influence of discontinuity between school and home cultures on students' academic and daily use of language; to the possibility of limited comprehension of content with cultural references; and, to classroom interactions and how rules and specific genre-specific modes of expressions of particular subject fields are applied (e.g., Mathematics; Elbers, 2010).

When teachers show such cultural capacity and adjust their instructional and relational processes to reflect their students' cultural and language strengths, their schooling experiences have been shown to improve significantly with regard to intergroup attitudes (Plaut, Thomas, & Goren, 2009), engagement in learning

(Authors, 2019), and academic achievement (Gay, 2018). Therefore, it has been argued that teachers should be taught and held accountable for their readiness to teach diverse student bodies in an increasingly interconnected world (Gay, 2018).

1.3. Teacher professional development

We conceptualize *professional development* following the conceptualization of Darling-Hammond, Hyler, and Gardner (2017, p.2), as "a subset of the range of experiences that may result in professional learning", which are "both externally provided and job-embedded activities that increase teachers' knowledge and help them change their instructional practice in ways that support student learning"; and, *professional learning* as the expected outcome of professional development. Although research on the effectiveness of general of professional learning opportunities is mixed, there is some consensus on what constitutes effective learning opportunities. Darling-Hammond et al. (2017) conducted an extensive review of the literature and indicated that: i) active learning opportunities, ii) that are situated in teachers' teaching contexts, iii) supported by experts and coaches, iv) offered for a sustained duration, v) and that offer opportunities for feedback and reflection, have the potential to be effective. A change in teachers' practice, however, is not only dependent on an increase in knowledge and skills, but also on their attitudes and beliefs (Opfer & Pedder, 2011).

Attitudes and beliefs are both separate and greatly intertwined (Kurdi, Mann, Charlesworth, & Banaji, 2019). While attitudes are conceptualized to be general evaluations on a positive-negative continuum (i.e., valenced; e.g., liking multiculturalism), beliefs are conceptualized to be specific, falsifiable semantic representations (e.g., multiculturalism is effective). Researchers, however, argue that such clear-cut separation of attitudes or evaluative representation, and beliefs or semantic representations may not be possible as a majority of beliefs are valenced themselves (e.g., multiculturalism is a more useful approach to diversity than colorblindness). As such, positive attitudes can be, to a large extent, expected to align with positive beliefs and vice versa (Kurdi et al., 2019). Therefore, in the current study, we also view these concepts as separate but intertwined.

As discussed in Tualaulelei and Halse (2021), multicultural education is strongly connected to teachers' racial, ethnic, and cultural attitudes and beliefs, which are often biased, continuously present, and highly influential in shaping teachers' cognitions and actions. Sleeter (2001) reports in their review, for instance, that many preservice teachers have stereotypic beliefs about minority children in that these students bring attitudes to class that interfere with education. Such beliefs and conceptions presume that children are unable to learn or to perform to the standards of mainstream students (Clycq, Ward Nouwen, & Vandenbroucke, 2014). In addition, teachers from mainstream backgrounds generally bring little awareness or understanding of interpersonal biases such as racism and interpret social change as meaning any kind of change except a change of structural inequalities like racism (as discussed in Sleeter, 2001). Such orientations have a great impact on how teachers select information, what they choose to learn and sustain (Labone & Long, 2016). Without changes in attitudes and beliefs, professional development is not as likely to result in teachers' application of multicultural practices.

1.3.1. Teacher professional development in multicultural education

As such, professional development that aims to improve teachers' effective response to diversity should target teachers' orientation towards diversity (Liang & Zhang, 2009). Amongst the approaches to teaching for social justice, multicultural education practices (further detailed below) have been increasingly advocated by researchers and practitioners in order to effectively respond to diversity in classrooms (Parkhouse et al., 2019). Yet, evidence for the effectiveness of professional development in multicultural education in positively influencing teachers' attitudes, beliefs, and practices is rather limited. To date, empirical evidence has relied predominantly on qualitative studies that focused either on teachers in primary or in secondary schools and have been conducted within the U.S educational context.

Quantitative evidence on the topic is all the more limited. The few earlier quantitative studies yielded mixed results on the effectiveness of various types of *preservice* multicultural teacher education (reviewed in Sleeter, 2001). The results from later studies, similarly, showed either modest improvements in preservice teachers' attitudes and beliefs that did not translate to practice (Bravo, Mosqueda, Solís, & Stoddart, 2014), limited improvement of the ability to positively respond to school diversity with exceptions to students with behavioral disabilities (Gao & Mager, 2011), or no effect on teachers' beliefs (Reiter & Davis, 2011). Bravo et al. (2014) compared changes in preservice teachers' beliefs and practice across an intervention ($n = 65$) group that received guidance in teaching science in culturally and linguistically responsive ways, and a control group ($n = 45$). The intervention group developed stronger beliefs about their efficacy in promoting collaboration in science teaching than the control group. However, the researchers failed to find any significance differences in changes in beliefs about other aspects of culturally and linguistically responsive teaching such as developing language and literacy across the curriculum, connecting school to students' lives, teaching complex thinking, and engaging in instructional conversations. The researchers attributed this gain in teacher beliefs about their efficacy in promoting collaboration to the substantive time the instructors spent on this practice compared to the other practices. A follow-up classroom observation of a subset of preservice teachers ($n = 56$), however, revealed very low incidence of translating the self-efficacy beliefs into practice. Similarly, Gao and Mager (2011), assessed the impact of a program that aimed to cultivate culturally responsive inclusive educators. The pre-post test score differences of 168 teachers who participated in the program, on scales that measure how preservice teachers view educating children with specific disabilities and that measure teachers' professional and personal beliefs about diversity, showed that teachers exhibited positive changes in their beliefs about school diversity but upheld their negative attitudes about teaching children with behavioral disabilities. Lastly, Reiter and Davis (2011) assessed the effects of a diversity program that introduced multiculturalism to preservice teachers ($N = 153$) as a comprehensive approach to promote equity and celebrate diversity. The researchers found only negligible changes to the preservice teachers' beliefs on the extent to which students' background characteristics are influential on their learning.

Parkhouse et al. (2019) reported that amongst the studies that measure the impact of *in-service* professional development in multicultural education through teacher reports or observation of classroom practices, only three investigated growth in teachers through quantitative measures and reported positive results. Some mixed methods studies investigating the effects of professional development programs in multicultural education on pre-service teachers (e.g., Bodur, 2012) similarly reported positive effects of such programs on several competencies for teaching in urban areas. Yet, none of these studies focused on the effects of in-service professional development on teachers' attitudes and beliefs.

Overall, as previously observed (Reagan, Chen, & Vernikoff, 2016) and also evident from the above-reviewed literature, research evidence on the topic is "overwhelmingly small-scale".

Available quantitative studies provide only mixed and scarce evidence for effectiveness of teacher professional development in multicultural education in improving teachers' attitudes and beliefs. These studies do not offer a panoramic view on different teacher populations and professional development at different stages of their trajectories.

Questions that remain are: at which stage of teachers' professional trajectories, what aspect of multicultural education, and for which teachers may professional development in multicultural education have a positive impact on teachers' attitudes and beliefs? This calls for more large-scale quantitative investigations that can offer a roadmap to researchers for future studies, as many school systems are looking for ways to improve their teachers' response to increasing diversity in their classrooms, improve student belongingness (Stevens, Crul, Slootman, Clycq, & Timmerman, 2019), and eliminate the achievement gap between different groups of students (OECD, 2016). We, therefore, focus our large-scale investigation on the relationship between professional development in multicultural education on teachers' attitudes and beliefs around diversity.

1.4. Type and timing of teacher professional development in multicultural education

The influence of the professional development programs can change as a function of the type of program, as well as the timing of this program. In line with the specific attention in the literature to second language development, two types of teachers' professional development in multicultural education can be distinguished: i) professional development in *multicultural education* (ME), including promoting positive community relations, developing intercultural understanding, teaching a culturally inclusive curriculum, incorporating anti-racism strategies, and teaching refugee students[2] (Watkins, Lean, Noble, & Dunn, 2013), and ii) professional development in teaching *English as a Second Language* (ESL).[3] Although ESL is one element in multicultural education, it requires more detailed attention to methods for second language acquisition and is therefore dealt with as a distinct area of expertise in the current study (as in Watkins, Lean, & Noble, 2016).

Teachers who have undergone professional development in ME might have a more concrete understanding of the multicultural strategies they can use to improve cultural inclusiveness and may dwell more explicitly on the underlying equity principle of multiculturalism compared to teachers who have undergone professional development in ESL. The latter group, on the other hand, may have learned to use a more limited range of these strategies with the specific aim to improve the language abilities of their students (NSW Department of Education, 2018), but may have been exposed to multicultural ideologies for a longer period of time as ESL training usually takes longer than other aspects of multicultural education (NSW Department of Education, 2018).

Teachers can receive such professional development at different points in their careers. During preservice teacher training, the range of programs focused on multicultural education tends to be collapsed into a single course within the entire degree, if addressed at all (Mills, 2008). Postgraduate qualifications (e.g., language development specialization or master's degree), on the other hand, are more expansive and specialized (Watkins et al., 2013). Similarly, in-service professional development tends to be specific in scope and pursued at point of need to prepare the teacher for a present or a future role. They tend to be offered in the form of one-day workshops and are sometimes accompanied by additional experiences such as providing video feedback[4] (Parkhouse et al., 2019).

In our study, we therefore considered the type of professional development and the timing of the learning as factors in the effectiveness of the programs. The current study is unique in its ability to integrate information from teachers who received professional development in different aspects of multicultural education at different stages of their careers, who are appointed to both primary and secondary schools, and who occupy both executive and non-executive teaching positions. To our knowledge, being the largest study in scale that sought quantitative evidence for the effectiveness of professional development in multicultural education, the current study allows us to compare the strength of examined relationships between different groups of teachers that were previously investigated in isolation from each other. As a result, it can give insights on which type of professional development when and for whom might make the biggest impact. These insights are important for researchers, educators, and policy makers who are researching ways to effectively integrate multicultural education into teacher professional development programs, and who are debating the place of such programs in educational policy, which is still the case in many European countries that consider diversity as something to be tackled rather than embraced (European Commission Public Policy and Management Institute, 2017).

1.5. The present study

The main question of the present study is whether teachers who have had professional development in ME or ESL during their preservice training, as postgraduate qualification, or as in-service professional development in multicultural education differ in their approach to diversity from teachers who did not have such professional development in their attitudes and beliefs around diversity.

We examined the relationship between professional development in multicultural education, the timing of the professional development, and teachers' attitudes and beliefs. As previously mentioned, attitudes were operationalized as tendencies to evaluate and respond in a positive or negative manner, and beliefs as representations of information (Kurdi et al., 2019).

1.5.1. Hypotheses

Given the lack of previous literature that includes teacher professional development in ME and ESL, received during preservice training, as postgraduate qualification, or as in-service professional development in a one study, our hypotheses are presented separately for the type and the timing of the professional development. Our hypotheses are as follows:

Hypothesis 1: We expected the two types of professional development, multicultural education (ME) and English as Second Language (ESL), to have positive relationships with teachers'

[2] This distinction is based on secondary survey data we used for the current study (Watkins et al., 2013) and previous publications on these data (Watkins et al., 2016).The survey was devised in conjunction with the New South Wales Department of Education. The specific multicultural education topics are included in the survey upon their suggestion, which at that time was providing a lot of professional learning to schools.

[3] The language-focused professional learning was referred to as ESL during the time of data collection. However, currently, it is referred to as English as an Additional Language or Dialect (EAL/D) in New South Wales where the study is conducted.

[4] Although more extensive online trainings are now offered with accreditation from the New South Wales Education Standards Authority (NESA), where the current study is conducted, these do not represent the norm and were not available at the time of the data collection.

multicultural attitudes and beliefs; however, since the content of these professional learning opportunities differ significantly, their relationships with attitudes and beliefs can also show differences.

Hypothesis 2: Moreover, we expected the effect of these professional development to show differences based on their timing such that postgraduate qualifications would the highest impact on teachers' attitudes and beliefs, followed by in-service professional development, and initial preservice training respectively.

In addition, we included a range of factors in our study that can contribute to the variation in reported attitudes and beliefs of teachers, both at the teacher-level and at the school-level. The teacher-level factors included teachers' country of birth, their self-identified gender, years of teaching experience, and their position in school (i.e., classroom teacher or executive staff with teaching duties). Teachers' country of birth is related to where teachers received their initial preservice training, the duration of the training, and the quality of education (OECD, 2019). Moreover, the birth country is related to their first language, and possibly to intergroup attitudes depending on their national identity and attachment (Esses, Dovidio, Jackson, & Armstrong, 2002), which may influence their perspectives on diversity matters within and outside of school, since teachers may personally relate to these matters themselves due to their migration histories (Edwards, 2016). In addition, female teachers are previously found to be more sensitive to others' distress (McCue & Gopoian, 2000) and hence may be more aware of adverse experiences (e.g., racism) in their students' lives compared to their male colleagues. Furthermore, teachers who are more experienced may find it hard to modify their instruction and their methods, and adopt new approaches that are acquired through professional development (Kennedy, 2016). On the other hand, more experienced teachers and teachers who are full-time classroom teachers with no additional executive duties (i.e., due to their position in their school) might spend more time with their students. These teachers may have more knowledge and positive intergroup attitudes due to increased exposure to different groups of students (Allport, 1954).

This could also be the case for teachers who are appointed to schools with relatively higher cultural, ethnic, and linguistic diversity. Similarly, teachers may have the opportunity to form closer bonds with their students, if they are appointed in primary compared to secondary schools, since in these schools, children usually have only one or two teachers throughout the school year. Ergo, these school-level variables were also included in our model.

2. Method

2.1. Data and participants

Our research draws on secondary data from a state-wide survey of public school teachers in New South Wales (NSW), Australia, which was part of the three-year Australian Research Council Linkage Project *Rethinking Multiculturalism/Reassessing Multicultural Education* (RMRME; Watkins et al., 2013).[5] The aim of this project was to investigate "In what way do current practices of multicultural education promote intercultural understanding and what knowledges and skills do teachers require to assist students attain this capability" (Watkins et al., 2013, p. 9) in order to inform policies of NSW Department of Education. Being one of the largest state-ran and -managed education system in the world with a culturally, ethnically, and linguistically diverse student population (Watkins et al., 2016), the NSW education system provides a compelling case to examine multicultural education.

As part of this project, 55,000 permanent teachers and executive staff in 1554 New South Wales public schools were reached via their departmental email address during Term 2 of 2011. The email contained a link to the survey instrument. The self-administered and anonymous response rate was just short of 10% of the overall NSW Department of Education teaching population (Watkins et al., 2013), corresponding to 5128 of respondents. Among the respondents, 3145 were teachers who had teaching duties at the time of the study (i.e., classroom teachers and executive staff with teaching duties) and were appointed to public primary and secondary schools. The rest of the teachers were either specialist teachers or were holding a non-teaching executive function only and were appointed to schools for specific purposes (e.g., for students with intellectual disability) or in central/community schools that provide education to students from kindergarten to year 12 together (e.g., in the same room in remote rural areas). These teachers were not included in our sample. Further, 139 of the teachers were multivariate outliers and were excluded after inspecting the Mahalanobis distance ($\alpha = 0.05$).

Among the remaining 3006 teachers, 70.8% were classroom teachers (with no executive duties), 29.2% were executive staff that were engaged in teaching. Forty-six-point four percent of these teachers were primary, and 53.6% of them were secondary school teachers. The teachers had an average of 18.81 years of teaching experience ($SD = 11.02$). Seventy-six percent of the teachers were female, 79.8% were born in Australia, 87.7% had English as their first language, and were predominantly trained in Australia (92.2%). These teachers were appointed to schools that had an average student population of 34.01% ($SD = 32.53$) from Language Backgrounds Other Than English (LBOTE).[6] Twenty-six-point seven percent of the teachers reported having received professional development in ESL and 49.4% of teachers reported having received professional development in ME during their initial preservice training. Only 6.9% of the teachers reported having received professional development in ESL and 5.1% of the teachers reported having received professional development in ME as a postgraduate qualification. Thirty-three-point eight percent and 79.1% of the teachers reported having received professional development in ESL and ME as in-service professional development respectively. These percentages are summarized in Table 1. Please note that teachers might be included in each of these categories.

2.2. Analytical approach

The RMRME survey included a range of questions on observed variables such as i) teachers' demographics, and ii) teacher professional development in aspects of multicultural education; and non-observed, latent variables on iii) teachers' beliefs about what are effective strategies in fostering a culturally inclusive environment, iv) their beliefs on what the important goals of multicultural education are, v) their attitudes toward diversity, schooling, and multiculturalism, and vi) their understanding of diversity.

In the current study, we used *structural equation modeling* (SEM) as our analytical strategy. In our structural model, observed variables from the survey constituted the exogenous variables

[5] As part of the RMRME Project, the researchers also captured perspectives of parents, students, and teachers across NSW schools regarding multiculturalism and multicultural education through focus groups and interviews. Moreover, the researchers offered multicultural training to schools that later on initiated their own action research, analyses of which are provided as the last step of the three-year RMRME project.

[6] This captures students who themselves or their parent(s) speak a language other than English at home (Authority Australian Curriculum Assessment and Reporting, 2019.

Table 1
Teachers' demographic profiles in percentages.

Teachers ($N = 3006$)	Percentage
Classroom teachers with no executive duties	70.8%
Executive staff with teaching duties	29.2%
Primary school teachers	46.4%
Secondary school teachers	53.6%
Born in Australia	79.8%
English as first language	87.7%
Teacher training received in Australia	92.2%
Average school population with students from LBOTE backgrounds	34.01%
Received professional learning in ESL during initial pre-service training	26.7%
Received professional learning in ME during initial pre-service training	49.4%
Received professional learning in ESL as postgraduate qualification	6.9%
Received professional learning in ME as postgraduate qualification	5.1%
Received professional learning in ESL as in-service professional development	33.8%
Received professional learning in ME as in-service professional development	79.1%

(independent variables), whereas latent variables constituted the endogenous variables (outcome variables), as further detailed below in 'Survey Items'.

Teachers' attitudes and beliefs are not directly observable (latent) but are implied by their relationships to observed variables (their indicators). In addition, items measuring attitudes and beliefs were initially grouped together in the RMRME survey to measure separate constructs (see Appendix A Table A1). This implies that the items that were grouped together should covary due to an underlying latent factor. Therefore, we chose to use *structural equation modeling* (SEM) to investigate the survey data that supports the use of latent factors.

In order to examine the factor structures of the grouped items that were suggested by the survey design, we first conducted an *exploratory factor analysis* (EFA) without imposing a specific hypothesized model. This is because content or construct validity of the data collection tool were not discussed in previous studies or reports published on the survey data. Therefore, we had no prior knowledge that the items did indeed measure the suggested/intended constructs. Based on the EFA results, we specified a model (i.e., *measurement model*) and evaluated its fit using *confirmatory factor analysis* (CFA) to validate our latent constructs. CFA tests a pre-specified model by imposing the model on data and evaluating how well the model fits to the data. EFA and CFA were performed on two separate samples from our data set that we split using simple random sampling.

After performing CFA, we further expanded the measurement model by specifying relationships between the observed and the latent variables (i.e., formed the *structural model*). A few alternatives exist under the umbrella of SEM, including the Multiple Indicator Multiple Cause (MIMIC) model, where a latent factor is reflected by some observed variables (i.e., indicators) and influenced by some others (Finch & French, 2011). Accordingly, in the current study, our reflectively modelled latent constructs are said to be influenced by observed predecessor that are teachers' background variables and school-level context variables. The latent variables were the three factors that were specified after our exploratory and confirmatory factor analyses, which are further detailed in the sections below. In addition, we examined the correlations between the latent endogenous variables, teachers' attitudes and beliefs, since, as previously discussed, we consider attitudes and beliefs as separate by intertwined constructs that may not have a clear-cut separation (Kurdi et al., 2019).

We used the open-source statistical software *R* (RStudio Version 1.2.1335) for our analyses. Specifically, we used the R package *lavaan* version 0.6–5 (Rosseel, 2012) to specify, estimate, and analyze our models.

2.3. Survey items

2.3.1. Observed variables: teacher background and school-level context variables

The observed variables in our study constituted the exogenous variables of the structural equation model, and included teachers' gender identification (0 = male, 1 = female), teaching experience in years (continuous), country of birth (0 = other, 1 = Australia), position in their school (0 = executive staff with teaching duties, 1 = classroom teacher)), and whether or not they had professional development in ESL or in ME during their preservice years, as postgraduate qualifications, or during in-service professional development (represented in six binary variables; (0 = had no professional development, 1 = had professional development). Example items assessing professional development in ESL and ME are '*Did your pre-service teacher training include Teaching English to Speakers of Other Languages (TESOL) or English as a Second Language (ESL)*?' and '*Did your pre-service teacher training include any other aspects of multicultural education [than TESOL or ESL]*?'.

Moreover, the observed variables included school-level context variables that indicated the type of school teachers were appointed to (0 = primary school, 1 = secondary school), student percentage with language background other than English (LBOTE), and the Aboriginal and Torres Strait Islander (ATSI)[7] student percentage. Except for the teacher-level variables that informed us on whether teachers undertook professional development in ESL or ME, the observed variables listed above were included in our SEM as control variables.

2.3.2. Latent variables: teachers' attitudes and beliefs around diversity

The items reflecting teachers' attitudes and beliefs that we included in our models were initially grouped together to measure three separate constructs in the survey. The first construct was designed to reflect teachers' beliefs about strategies in fostering a culturally inclusive environment along a scale from 1 = least effective, to 5 = most effective. These strategies included both multicultural and monocultural strategies (e.g., "including Anglo-Australian heritage more" as means to improve cultural inclusiveness). The second construct was designed to reflect teachers' beliefs about the main goals of multicultural education along a scale from 1 = least important to, 5 = most important. The third construct was designed to reflect teachers' attitudes on diversity, schooling, and

[7] These students are Indigenous Australian individuals of Aboriginal or Torres Islander descent who identifies and are accepted by their community in which they live in as such (Gardiner-Garden, 2003).

multiculturalism measured by teachers' agreement with various statements along a scale from 1 = strongly disagree, to 5 = strongly agree. For the full range of items indicating latent variables, and their measurement scales, see Appendix A Table A1.

In order to test the suggested factor structure, we performed an exploratory factor analysis (EFA; see Appendix B). Results of the analysis portrayed a different factor structure than what was initially suggested by the survey. The first factor from our exploratory factor analysis included items that reflected teachers' beliefs on the effectiveness of various multicultural strategies (but not monocultural strategies) in fostering a culturally inclusive environment. We labelled this factor 'Beliefs on the Effectiveness of Multicultural Strategies'. The second factor included items that reflected teachers' beliefs on equitable chances at school and in society as important goals of multicultural education. We referred to this factor as 'Beliefs on the Importance of Equitable Chances'. The third factor included items that indicated that societies are stronger when people from different cultures assimilate, and it is not the responsibility of schools to accommodate students from diverse cultural, ethnic, and linguistic backgrounds. We therefore named this factor 'Support for Monoculturalism', reflecting the degree to which teachers support monocultural as opposed to multicultural attitudes at schools. The fourth factor had only two indicators and hence was excluded from further models. Based on the EFA results, we built our *measurement model* and validated our latent constructs using confirmatory factor analysis (CFA). These latent factors formed the endogenous (outcome) variables of the structural model.

3. Results

An investigation of missing data revealed that data were not missing completely at random. However, only 1.37% of all cases were missing and there were no variables with 5% or more missing values. A missing rate of 5% or less is inconsequential (Dong & Peng, 2013). Accordingly, we have not imputed our missing data, as we chose maximum likelihood estimation to assess model fit for both CFA and SEM and handled missing data using full-information maximum likelihood (FIML), which computes the likelihood case by case, using all available data from that case. In such situations, using an extra imputation technique to handle missing values is not needed.

3.1. Confirmatory factor analysis on the survey items

A correlation table of items with means and standard deviations is shown in Appendix A Table A2. Based on the exploratory factor analysis as described in Appendix B, we built a three-factor theoretical model. Table A1 presents the original outline of the items together with factors they belong to as specified in the CFA model.

We chose maximum likelihood estimation to assess the model fit and handled missing data using full-information maximum likelihood (FIML). The latent variables were allowed to covary and were constrained to have a mean of 0 and a variance of 1 (i.e., standardized) for scaling purposes, allowing free estimation of all factor loadings.

The fit indices indicated an acceptable but not an excellent fit between the model and the observed data, with the Root Mean Square Error of Approximation (RMSEA) of 0.07, and Standardized Root Mean Square Residual (SRMR) of 0.068. The comparative fit index (CFI) was 0.79, the Tucker-Lewis fit index (TLI) was 0.76, which were relatively low as the item correlations were initially low (see Appendix A Table A2). As the majority of the indexes indicated a good fit and were not out-of-step with similar studies with large participant numbers, we assumed the probability of good fit and did not perform any post-hoc modifications to the model. Expectedly, all the indicators showed significant positive factor loadings, with standardized coefficients ranging from .228 to .664 (see Appendix C Table C1).

3.2. Relationships between the observed variables

Correlations between the observed variables we included in our model are presented in Table 1. Due to the high number of participants, weak correlations between many of the variables are highly significant. We, therefore, only interpreted the correlations of |0.30| or higher as the relationships between the observed variables were not the main focus of our study.

The Aboriginal and Torres Strait Islander (ATSI) Student Concentration was moderately related to Concentration of Students from Language Backgrounds Other Than English (LBOTE). There seems to be significantly less ATSI population in schools with higher numbers of students from LBOTE. Twenty point four percent of the Aboriginal and Torres Strait Islander peoples reside in rural and remote areas where there are fewer LBOTE students, who usually cluster around the urban areas (Australian Bureau of Statistics, 2016). This could explain the significant negative correlation between ATSI and LBOTE student concentrations. We only included Concentration of Students from LBOTE in our SEM models, because it is moderately correlated with ATSI Concentration, and multicultural education is usually perceived as concerning students from LBOTE (Noble & Watkins, 2014).

In addition, teachers' Country of Birth was significantly related to their First Language and the Country in which they received their Initial Preservice Training. Teachers who were born in a country other than Australia were more likely to have a different language than English as their first tongue and were more likely to have received their initial preservice training outside of Australia. Similarly, teachers who had their Initial Preservice Training outside of Australia were more likely to have a First Language other than English. In our SEM models, we only included teachers' Country of Birth as a proxy for their First Language and Country of their Initial Preservice Training, which showed significant and high correlations with Country of Birth and were associated with other variables at a degree similar to that of Country of Birth (see Table 1).

Importantly, Concentration of Students from LBOTE was significantly related to teachers' In-service Professional Development in teaching ESL, which is an expected finding because teachers who teach students from LBOTE need to improve their skills in teaching ESL. It is also interesting that teachers' Preservice Training in ME and in ESL were significantly correlated, which may signal that preservice training programs that are attentive to one aspect of multicultural education are attentive also in the other aspect.

3.3. The full structural equation model

3.3.1. Model fit

Our SEM is described graphically in Fig. 1. We show the structural component above the latent variables, and we omitted the measurement component below the latent variables for a simpler visualization. We chose maximum likelihood estimation to assess the model fit and full-information maximum likelihood (FIML) to

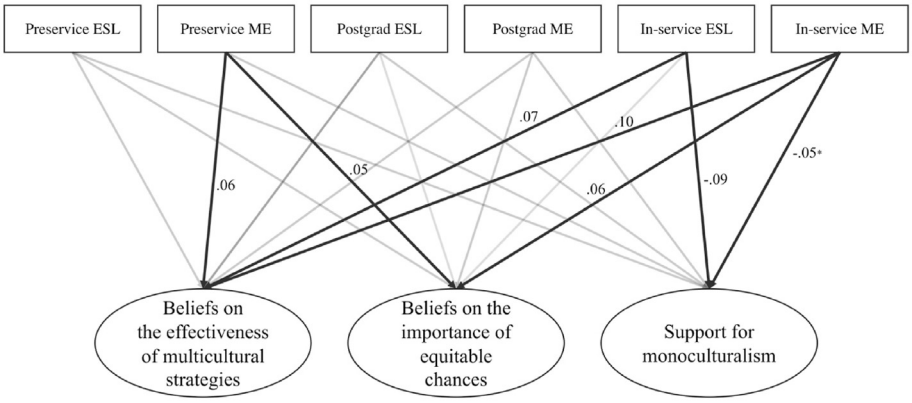

Fig. 1. The structural equation model. *Note*. The control variables and the observed indicators for the three latent variables are omitted from the graph for clarity. The observed variables in the graph are dummy coded (0 = no professional learning, 1 = did have professional learning). The unstandardized path coefficients of the significant relationships ($\alpha = 0.05$) are shown on the figure (*marginally significant, $p = .05$).

handle missing data. Moreover, we clustered standard errors within each school to account for the multilevel nature of the data. The latent variables were allowed to covary, and each latent variables' scale was set to the scale of its first indicator (default by *lavaan*).

The tested model appears to be a good fit to the data looking at the RMSEA, which was 0.055, and at SRMR, which was 0.049. The CFI and TLI, however, were relatively low with 0.77 and 0.74 respectively. This is an expected result considering the item correlations that were initially low (see Appendix A Table A2). No post-hoc modifications were made to the model.

3.3.2. Path coefficients

Table 3 shows the results of our analysis. Coefficients of the significant relationships are also indicated in the structural equation model presented in Fig. 1. Preservice Training on ESL had no effect on teachers' attitudes and beliefs. Preservice Training on ME, however, had a significant positive effect on Beliefs on the Effectiveness of Multicultural Strategies and on the Importance of Equitable Chances for students as an outcome of multicultural education. Teachers who received In-service Professional Development in ESL were also more likely to Believe in the Effectiveness of Multicultural Strategies for a culturally inclusive environment and less likely to show Support for Monoculturalism. Teachers who received In-service Professional Development in ESL, however, did not differ from the teachers who did not receive In-service Professional Development in ESL in their Beliefs on the Importance of Equitable Chances for students. Teachers who undertook Preservice Training and In-service Professional Development in ME followed a similar trend. Unexpectedly, Postgraduate Qualifications in either ESL or on ME did not have a significant effect on teachers' attitudes and beliefs.

Moreover, there were significant correlations between the latent variables, indicating that teachers who Believed more in the Effectiveness of Multicultural Strategies were more likely to believe in the Importance of Equitable Chances for all students ($r = 0.69$, $p < .001$) and show less Support for Monoculturalism ($r = -0.65$, $p < .001$). Similarly, teachers who Believe more in the Importance of Equitable Chances were less likely to show Support for Monoculturalism ($r = -0.59$, $p < .001$).

In addition, secondary school teachers reported to Believe less in the Effectiveness of Multicultural Strategies in creating a culturally inclusive environment compared to primary school teachers. Teachers in schools where the Concentration of Students from

Table 2
Pearson correlations between the observed variables.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. School Type	–														
2. LBOTE Percentage	.05*	–													
3. AATSI Percentage	-.02	-.43**	–												
4. Gender Identity	-.24**	.04*	-.04	–											
5. First Language	-.13**	-.19**	.08**	.03	–										
6. Birth Country	-.10**	-.13**	.06*	.03	.52**	–									
7. Position in School	.08**	.02	-.05*	.05*	-.11**	-.12**	–								
8. Preservice Tr. Country	-.10**	-.11**	.04*	.03	.38**	.51**	-.08**	–							
9. Teaching Experience	-.03	-.10**	-.02	-.08**	.06*	.04*	-.28**	-.05**	–						
10. Preservice ESL	-.18**	.13**	-.06*	.07**	-.10**	-.08**	.03	-.08**	-.17**	–					
11. Preservice ME	-.07**	.00	.05*	.01	.00	.00	.04*	-.01	-.27**	.31**	–				
12. Postgrad ESL	.00	.11**	-.07**	.04*	-.11**	-.13**	.01	-.09**	.06*	.16**	.01	–			
13. Postgrad ME	.03	.02	-.01	-.03	-.07**	-.07**	.03	-.07**	.04*	.04*	.06*	.18**	–		
14. In-service ESL	-.13**	.31**	-.16**	.10**	-.02	-.04*	-.09**	-.03	.05*	.26**	.08**	.26**	.09**	–	
15. In-service ME	-.05*	.05*	.03	-.01	-.01	-.01	-.17**	-.01	.18**	.05*	.09**	.04*	.05*	.19**	–
M	–	34.01	5.87	–	–	–	–	–	18.81	–	–	–	–	–	–
SD	–	32.53	8.80	–	–	–	–	–	11.01	–	–	–	–	–	–

Note. **$p < .001$, *$p < .05$. School type (0 = primary school, 1 = secondary school), LBOTE = Language Background Other Than English, AATSI = Aboriginal and Torres Strait Islander, gender identity (0 = male, 1 = female), first language (0 = other, 1 = English), birth country (0 = other, 1 = Australia), position (0 = executive teacher, 1 = classroom teacher), preservice training country (0 = other, 1 = Australia). ESL = English as Second Language, ME = Multicultural Education.

Table 3
Results from structural equation modeling.

	Beliefs on the Effectiveness of Multicultural Strategies				Beliefs on the Importance of Equitable Chances				Support for Monoculturalism			
	B	*SE*	*p*	β	*B*	*SE*	*p*	β	*B*	*SE*	*p*	β
Preservice ESL	-.00	0.02	.962	-.00	-.03	0.03	.356	-.02	.01	0.02	.634	.01
Preservice ME	.06	0.02	.009	.06	.05	0.03	.039	.05	-.02	0.01	.078	-.04
Postgrad ESL	-.02	0.04	.574	-.01	.01	0.05	.802	.01	-.04	0.02	.111	-.04
Postgrad ME	.06	0.05	.234	.03	-.08	0.06	.144	-.03	-.01	0.02	.706	-.01
In-service ESL	.06	0.02	.005	.07	.05	0.03	.100	.04	-.05	0.02	.001	-.09
In-service ME	.11	0.03	.000	.10	.08	0.03	.017	.06	-.03	0.02	.050	-.05
Control Variables												
School Type	-.07	0.02	.001	-.08	-.04	0.03	.088	-.04	-.01	0.01	.388	-.02
LBOTE	-.00	0.00	.000	-.12	.00	0.00	.264	.03	-.00	0.00	.895	-.01
Gender Identity	.14	0.03	.000	.13	.16	0.03	.000	.12	-.08	0.02	.000	-.14
Birth Country	-.10	0.03	.000	-.09	-.10	0.03	.001	-.07	.03	0.02	.025	.06
Position in School	-.05	0.02	.014	-.05	-.03	0.03	.190	-.03	.05	0.02	.000	.10
Teaching Experience	-.01	0.00	.007	-.07	.01	0.00	.000	.09	.01	0.00	.000	.12

Note. School type (0 = primary school, 1 = secondary school), LBOTE = Language Background Other Than English, gender identity (0 = male, 1 = female), birth country (0 = other, 1 = Australia), position (0 = executive teacher, 1 = classroom teacher), preservice/postgraduate/in-service ESL or ME (0 = had no professional development, 1 = had professional development), ESL = English as a Second Language, ME = Multicultural Education.

LBOTE was higher seem to follow a similar trend. Compared to executive staff with teaching duties, classroom teachers reported to Believe less in the Effectiveness of Multicultural Strategies in fostering a culturally inclusive classroom environment. These teachers were also more likely to Support Monoculturalism. Furthermore, teachers with more Teaching Experience were more likely to Believe that Equitable Chances are Important as goals of multicultural education compared to their less Experienced counterparts. Interestingly, at the same time, they were less likely to Believe in the Effectiveness of Multicultural Strategies for fostering cultural inclusiveness and they showed more Support for Monoculturalism as opposed to multicultural attitudes. Female teachers reported to Believe more in the Effectiveness of Multicultural Strategies in creating a culturally inclusive environment and the Importance of Equitable Chances as their positive outcomes on students compared to male teachers. Moreover, they were less likely to show Support for Monoculturalism. Expectedly, teachers with a Birth Country outside Australia followed a parallel trend.

4. Discussion

The current study addressed several important questions in gaining more insight into the effects of professional development in multicultural education on teachers' approach to diversity. Drawing on (secondary) data collected in public schools in New South Wales, Australia, we examined the relationship between professional development in multicultural education, the timing of the learning, and teachers' attitudes and beliefs.

4.1. Type of professional development

The first hypothesis was confirmed, showing that teachers who received professional development in multicultural education (ME) during preservice and in-service years were more likely to believe that multicultural strategies are effective in fostering cultural inclusiveness and that providing equitable chances for students is an important goal of multicultural education. Furthermore, teachers who received professional development in teaching ESL during their in-service years were less likely to support monoculturalism, whereas there were no direct (negative) relationships between professional development in ME at any time point and teachers' support for monoculturalism. These findings may be attributed to the extensiveness and organization of the two professional development programs. Becoming a discipline in its own right, professional development in teaching ESL typically includes a rather extensive program wherein teachers have ample opportunities to engage in and reflect on multicultural strategies, compared to sporadic professional development in ME (NSW Department of Education, 2018). A prolonged exposure to multicultural ideology might, therefore, promote multicultural as opposed to monocultural attitudes in teachers (Darling-Hammond, Wei, Andree, Richardson, & Orphanos, 2009). This is less likely during professional development in ME, which is most often provided in the form of sporadic workshops, each lasting one day or less, leaving no room for supervised application to practice (Australian Curriculum Assessment and Reporting Authority, 2011).

Moreover, our results showed that teachers who received in-service professional development on teaching ESL were more likely to also believe that multicultural strategies are effective in fostering cultural inclusiveness, compared to teachers who did not receive in-service ESL professional development. This could be because ESL training includes learning how to value and incorporate students' cultural knowledge and perspectives, and requires building on their students' cultural and linguistic resources, and funds of knowledge; hence, making use of multicultural strategies (Banks, 2016).

Overall, compared to professional development in ESL, professional development in ME had stronger relationships with teachers' beliefs on the effectiveness of multicultural strategies and beliefs on the importance of multicultural strategies in providing equitable chances, and a weaker relationship with teachers' support for monoculturalism. These findings support our first hypothesis, which stipulates that the two types of professional development have positive relationships with teacher multicultural attitudes and beliefs but to different extents.

4.2. Timing of professional development

Our results indicated that the most effective time to receive professional development is during in-service years followed by preservice training, which only partially supported our second hypothesis. This could be due to the immediate applied value and relevance of in-service professional development for teachers' experiences and practices (Burchell, Dyson, & Rees, 2002). Previous research showed that, according to teachers, the best time to engage in professional development is during their initial teacher training (Watkins et al., 2013). Our results, however, imply that initial teacher training is unlikely to be sufficient in fully preparing the teachers to serve in multicultural classrooms, and it is more constructive to approach this preparation as an on-going process. It is critical that teachers persist in their efforts throughout their careers with professional development.

Contrary to our expectation that postgraduate qualifications would have the highest impact on teachers' attitudes and beliefs, however, postgraduate qualifications in neither ESL nor ME had a significant effect. This non-significant finding could be explained by focusing on the unequal number of participants who reported to have undergone professional development during their preservice training, as postgraduate qualification, and while in service. Considering the fact that the percentage of teachers who reported to have received postgraduate qualifications were only one fifth of the percentage of teachers who reported to have undergone preservice or in-service professional development, the sample size of this group may not have been large enough to capture what was likely to be a small effect (see Table 3 for the effect sizes of professional development).

4.3. Interpretation of control variables

Additionally, we also explored the relationships between control variables and teachers' attitudes and beliefs. As detailed earlier, our results suggest that the more teachers spend time in a classroom due to, being a primary rather than secondary school teacher, being a full-time classroom teacher rather than executive staff with teaching duties, or due to having longer teaching experience, especially with a higher amount of diversity, the less likely they believe that multicultural strategies are effective and the more likely they are to support monoculturalism. These results echo previous findings that teachers who have been teaching for a longer period report to have less positive multicultural attitudes and to engage less in prejudice reduction practices, compared to those who have been teaching for a shorter period of time (Authors, 2019). This may signal different processes that are worth investigating in the future. First, teachers may feel ill-equipped for accommodating diversity in the classroom (OECD, 2017), because the strategies do not seem effective or realistic, or the professional development programs are not easily accessible. Second, on a related note, teachers may feel discouraged with time because they do not receive sufficient institutional and administrative support. Structures surrounding the individual teachers, such as the school environment, can reproduce inequalities and teachers may perceive the reforming of these structures to be out of their reach (Banks, 2016). Third, employing multicultural strategies may increasingly exhaust teachers, because it increases the pressure towards another performance standard (OECD, 2017).

5. Limitations and future research

The findings of our study should be interpreted in light of certain limitations. Firstly, inspecting the standardized results from our structural equation model reveals that the effects of various professional learning opportunities on multicultural education on teachers' attitudes and beliefs are rather small. In order to answer our questions, we used secondary data that were not initially collected for the purposes of our study. As follows, the RMRME survey was not particularly built to measure our latent constructs, which could explain the low effect sizes.

Secondly, due to the study's quantitative nature, we do not know what meaning teachers ascribed to the ambiguous terminology used in the survey items, such as *culture* and *multiculturalism*. These terms can carry a wide array of definitions and what teachers understand from these terms can influence the way teachers approach sociocultural matters in their classrooms (e.g., Silverman, 2010).

Thirdly, we only had access to information on whether teachers received or did not receive professional development in multicultural education. However, specifications of these professional learning opportunities (e.g., content, duration) that may influence the effects of professional development on teachers' attitudes and beliefs were not reported. For instance, in-service professional development programs that are more intense and more frequent were found to be positively associated with increased teacher and student learning (Darling-Hammond et al., 2017). Moreover, we investigated the effects of having had professional development during preservice training, as postgraduate qualification, or as in-service professional development separately. We did not, however, consider how teachers differed in their attitudes and beliefs if they received professional development at more than one point in time. Having received professional development during preservice years might have influenced the effectiveness of professional development during in-service years. Similarly, we did not examine whether having had both types of professional development compared to one would make a difference in influencing teachers' attitudes and beliefs around diversity.

Lastly, the results of our study could also be due to a selection bias in the sample, because the teachers who chose professional development in multicultural education may already have had more positive beliefs about the effectiveness of multicultural strategies. We therefore did not claim a causal relationship between beliefs and professional development. It is clear that teachers who received professional development during their postgraduate studies and in-service years are likely to have some positive beliefs about such programs in order to invest time in it, and the positive relationship implies that such professional programs are also likely to increase one's positive beliefs about multiculturalism. This is a reciprocal influence of beliefs, attitudes and professional development. What increases confidence in our results, however, is earlier research findings: The survey results from the state-wide study were compared to results from surveys of 14 case-study schools during a later stage of the Rethinking Multiculturalism Reassessing

Multicultural Education Project. These schools were chosen from all over NSW and showed a response rate of 75%. Their results did not show any significant differences from the state-wide survey data used in the current study (Lean & Dunn, 2013).

Our findings signal that the relationships investigated in the current study are worth further examination. Building on our findings, prospective research can use items that were especially formulated to assess our latent constructs to reach more robust and reliable results. Moreover, it would be interesting to examine whether the items measure the same underlying constructs in different groups of teachers who reside in rural compared to urban areas who experience diversity to different extents. Furthermore, asking teachers to report on the specifications of their professional development (e.g., recency, content, duration) can further our understanding of the effectiveness of such learning opportunities. Importantly, controlled experiments with which we can compare advancements in teachers' attitudes and beliefs before and after receiving professional development (versus control group), and longitudinal research to understand its long-term effects are needed to establish the causal influence of professional development on teachers' approaches to diversity. These studies can also overcome our last limitation by incorporating the number of times and different types of professional development teachers receive in their design.

6. Conclusion

Our research investigated the role of different types of professional development in multicultural education in different forms during teachers' educational trajectories on their approach to diversity. Despite its potential limitations, our research supplements the literature in important ways. Professional development in multicultural education (ME) and on teaching English as a second language (ESL) seems to be related to teachers' attitudes and beliefs to different extents. A prolonged exposure to multicultural ideology, which is the case in most professional development in ESL compared to ME, seems to have the possibility to be more effective in attitude change compared to a change in teacher beliefs. Moreover, our results indicate that in-service professional development in multicultural education can have a stronger effect on teachers' multicultural attitudes and beliefs, compared to the initial preservice training. It is very likely that we found in-service professional development to be more effective because it is more relevant to teachers' experiences at the time of the professional development. Therefore, experiences with students with different cultural, ethnic, and linguistic backgrounds through, for instance, compulsory internships at schools in urban areas, may render the content of the initial preservice training in multicultural education more relevant for practice. These experiences not only facilitate connecting professional development content with classroom practices, but also provide an extended exposure to multicultural perspectives that may stimulate teachers to form cultural self- and other-awareness, and better understand what role these perspectives play in their students' lives and schooling opportunities (Santoro, 2014). Additionally, our results suggest that these professional learning opportunities might especially benefit primary compared to secondary school teachers, classroom teachers compared to executive staff with teaching duties, teachers who are appointed to schools with higher percentage of students from language backgrounds other than the host language, and teachers who have been in the teaching force for a longer period.

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Appendix D. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.tate.2022.103701.

Appendix A

Survey Items.

Table A1
Teachers' Attitudes and Beliefs Items and the Latent Factors They Indicate in our Model

Item	Factor
20. Please rate each of the following school strategies in terms of their effectiveness in fostering cultural inclusiveness along a scale of least to most effective (1 = least effective, 5 = most effective)	
a. Increasing involvement of parents from culturally and linguistically diverse backgrounds	F1
b. Holding events to celebrate cultural diversity	F1
c. Including Anglo-Australian heritage more	F3
d. Implementing anti-racism strategies	F1
e. Developing cross-cultural curriculum	F1
f. Improving all students' academic outcomes	F1
g. Providing bilingual instruction	F1
h. Improving intercultural relations among students	F1
i. Including Aboriginal perspectives in the curriculum	F1
j. Accommodating diverse cultural learning styles	F1
21. What do you see as the main goals of multicultural education? Please rate each of the following along a scale of least to most important (1 = least important, 5 = most important)	
a. Developing shared social values	F2
b. Achieving equity in student learning outcomes	F2
c. Giving students the right to maintain and develop their cultural heritage	F1, F2
d. Giving all students equal chances to share in Australia's social, political and economic life	F2
e. Combating racism and discrimination	F2
f. Developing students' proficiency in English language and literacy	F2
g. Developing harmonious cross-cultural relations and intercultural understanding	F2
h. Developing a commitment to Australian identity	F2, F3
i. Fostering of skills in languages other than English	F1
Do you agree or disagree with the following statements? (1 = strongly disagree, 5 = strongly agree)	
30. Multicultural education should be a focus for all schools including those with few students from language backgrounds other than English.	F3
31. It is the responsibility of schools to cater for the needs of students from diverse cultural and linguistic backgrounds.	F3
32. It is not the responsibility of schools to address racism or discrimination in their schools.	F3
33. It is a good thing for schools to have students from different cultures.	F3
34. Society is weakened when people of different ethnic origins maintain their cultural traditions.	F3
35. Racism is a problem in Australian society.	F4
36. Racism is a problem in schools.	F4

Note. F = Factor. F1 = Beliefs on the Effectiveness of Multicultural Strategies. F2 = Beliefs on the Importance of Equitable Chances. F3 = Support for Monoculturalism. F4 was omitted from the models. The items are numbered according to their position in the survey. For the full survey, please see Watkins et al. (2013).

Table A2
Survey Item Correlations and Descriptive Statistics

	20a	20b	20c	20d	20e	20f	20g	20h	20i	20j	21a	21b	21c	21d	21e	21f	21g	21h	21i	30	31	32	33	34	35	36	*M*	*SD*
20a																											3.97	0.91
20b	.32**	–																									3.86	0.94
20c	.08**	.16**	–																								3.09	1.02
20d	.29**	.30**	.13**	–																							4.09	0.86
20e	.26**	.32**	-.02	.39**	–																						3.99	0.87
20f	.16**	.07**	.11**	.21**	.18**	–																					4.25	0.89
20g	.21**	.20**	.07**	.18**	.28**	.10**	–																				2.94	1.10
20h	.37**	.34**	-.01	.40**	.39**	.19**	.33**	–																			4.11	0.83
20i	.27**	.32**	.03	.34**	.41**	.19**	.26**	.42**	–																		3.89	0.98
20j	.29**	.27**	-.05*	.27**	.44**	.19**	.34**	.44**	.45**	–																	4.00	0.92
21a	.21**	.20**	.15**	.21**	.17**	.16**	.11**	.26**	.15**	.16**	–																4.06	0.99
21b	.24**	.14**	.04*	.23**	.20**	.33**	.12**	.26**	.23**	.24**	.34**	–															4.47	0.69
21c	.26**	.32**	-.08**	.22**	.35**	.10**	.28**	.33**	.34**	.36**	.29**	.36**	–														4.06	0.88
21d	.20**	.13**	.01	.24**	.19**	.23**	.08**	.27**	.20**	.19**	.32**	.44**	.39**	–													4.47	0.68
21e	.18**	.24**	-.04*	.45**	.26**	.15**	.14**	.36**	.30**	.24**	.27**	.35**	.39**	.41**	–												4.55	0.66
21f	.12**	.09**	.14**	.17**	.07**	.24**	.06**	.11**	.10**	.08**	.22**	.29**	.12**	.28**	.29**	–											4.55	0.66
21g	.23**	.30**	-.04*	.27**	.32**	.12**	.17**	.41**	.30**	.30**	.36**	.32**	.45**	.40**	.50**	.23**	–										4.43	0.69
21h	.07**	.07**	.40**	.11**	-.02*	.15**	.03	.07**	.06**	-.01*	.32**	.17**	.03	.22**	.14**	.30**	.23**	–									3.98	0.96
21i	.16**	.21**	.10**	.14**	.24**	.12**	.39**	.21**	.23**	.27**	.25**	.20**	.42**	.18**	.22**	.18**	.32**	.21**	–								3.42	1.04
30	.21**	.25**	-.13**	.21**	.34**	.07**	.19**	.28**	.31**	.30**	.18**	.21**	.40**	.19**	.28**	.01	.34**	-.07**	.25**	–							4.12	0.81
31	.19**	.19**	-.13**	.15**	.27**	.07**	.14**	.20**	.21**	.28**	.12**	.23**	.32**	.18**	.20**	.09**	.26**	-.04*	.16**	.45**	–						4.29	0.75
32	-.13**	-.11**	.11**	-.18**	-.17**	-.08**	-.06**	-.19**	-.16**	-.15**	-.10**	-.16**	-.18**	-.17**	-.24**	-.05*	-.18**	.04	-.04	-.23**	-.32**	–					1.37	0.69
33	.14**	.16**	-.13**	.11**	.24**	.11**	.13**	.21**	.20**	.21**	.16**	.20**	.30**	.22**	.22**	.08**	.26**	-.07**	.20**	.38**	.33**	-.26**	–				4.57	0.61
34	-.14**	-.13**	.22**	-.12**	-.20**	-.06*	-.13**	-.16**	-.20**	-.20**	-.04*	-.11**	-.34**	-.13**	-.19**	.01	-.22**	.20**	-.18**	-.30**	-.25**	.23**	-.34**	–			1.97	1.02
35	.08**	.03	-.11**	.17**	.12**	.02	.07**	.15**	.09**	.10**	.02	.09**	.13**	.10**	.22**	.00	.13**	-.10**	.05*	.19**	.11**	-.12**	.18**	-.08**	–		3.82	0.88
36	.05*	.01	-.10**	.16**	.10**	-.01	.08**	.12**	.08**	.08**	.00	.04*	.09**	.05*	.16**	-.02	.09**	-.10**	.07**	.17**	.09**	-.08**	.13**	-.07**	.73**	–	3.52	0.93

Note. *$p < .05$. **$p < .01$. Items were rated on a 5-point Likert-type scale (1 = least effective/least important/strongly disagree, 5 = most effective/most important/strongly agree).

Appendix B

Exploratory Factor Analysis on the Survey Items

We executed a parallel analysis to evaluate the number of factors to choose for factor analysis. The parallel analysis indicated that the maximum number of factors we could consider is 8. The parallel analysis scree plot in Figure B1 shows a solid (blue) line between the triangles, which represents the eigenvalues of actual data; and, two dashed (red) lines, placed on top of each other, that represent simulated and resampled data. On the plot, we have to examine the large drops in the actual data and determine the point where it levels off to the right. Moreover, we identify the point where the distance between simulated and actual data tends to be minimum, referred to as the point of inflection.

Based on the analysis and the plot, anywhere between 2 and 8 factors could be considered. As the items were presented together to reflect three constructs in the survey, we started with assessing the fit of a three-factor model.

Fig. B1. Parallel Analysis Scree Plot for Exploratory Factor Analysis

We considered the loadings that were more than 0.3 and did not load on more than one factor. Based on our cutoff, one item became nonsignificant, and 4 factors loaded on more than one factor.

To reach a simpler factor structure, we then continued with conducting factor analysis with four factors and used the same cut-off. With the current model, we reached a simpler structure but did not reach the simple structure, wherein there are no items that load on more than one factor as there were still 2 items that did so. Yet, a five-factor structure did not provide us with a theoretically sound model. Therefore, we decided on the four-factor model (see the factor loadings on Table B1).

The root mean square of the residuals (RMSR) was 0.04, which is acceptable as this value should be close to 0. The RMSEA (root mean square error of approximation) index was 0.061, showing a relatively good model fit. Lastly, the Tucker Lewis Index of factoring reliability was 0.83, an acceptable value.

Table B1
Three- and Four-Factor Model Factor Loadings

Item	Three-factor model loadings			Four-factor model loadings			
	F1	F2	F3	F1	F2	F3	F4
20a	.43			.46			
20b	.47			.55			
20c		.46				.57	
20d	.41			.47			
20e	.61			.64			
20f							
20g	.41			.55			
20h	.59			.62			
20i	.58			.63			
20j	.62			.65			
21a	.31	.40			.50		
21b	.39	.32			.59		
21c	.67			.31	.35		
21d	.38	.33			.68		
21e	.46				.51		
21f		.45			.51		
21g	.55				.50		
21h		.68			.47	.49	
21i	.42			.34			
30	.61					-.39	
31	.52					-.40	
32	-.35						
33	.48					-.41	
34	-.48	.31				.49	
35			.91				.90
36			.78				.81

Note. F = Factor.

Appendix C

Confirmatory Factor Analysis

Table C1
Results from Confirmatory Factor Analysis

F1: Effectiveness of Multicultural Strategies	*B*	*SE*	*p*	β
20a	.44	0.02	<.01	.50
20b	.45	0.02	<.01	.49
20d	.44	0.02	<.01	.52
20e	.54	0.02	<.01	.63
20f	.25	0.02	<.01	.28
20g	.50	0.02	<.01	.46
20h	.55	0.02	<.01	.67
20i	.60	0.02	<.01	.63
20j	.57	0.02	<.01	.63
21c	.30	0.04	<.01	.34
21i	.46	0.03	<.01	.44
F2: Importance of Equitable Chances				
21a	.43	0.02	<.01	.51
21b	.40	0.02	<.01	.58
21c	.30	0.04	<.01	.35
21d	.43	0.02	<.01	.63
21e	.43	0.02	<.01	.66
21f	.27	0.02	<.01	.40
21g	.48	0.02	<.01	.70
21h	.61	0.03	<.01	.64
F3: Support for Monoculturalism				
20c	.23	0.03	<.01	.23
21h	.51	0.04	<.01	.53
30	-.50	0.02	<.01	-.64
31	-.43	0.02	<.01	-.58
32	.31	0.02	<.01	.46
33	-.34	0.02	<.01	-.58
34	.51	0.02	<.01	.51

Note. F = Factor.

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