Associations between attitudes toward inclusive education and teaching for creativity for Indonesian pre-service teachers

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A B S T R A C T

This study investigated the relationship between pre-service teachers' attitudes toward inclusive education and teaching for creativity. The investigation was based on background factors, correlation, and regression between dimensions. The participants were 459 pre-service teachers from private and public universities across Indonesia. Data were collected using the Inclusive Education Scale and the Teaching for Creativity Scale (Indonesian version). The findings revealed no significant differences for all dimensions such as gender, age, and teaching experience. However, there were significant differences regarding university type in the dimensions of attitudes toward inclusive education and teaching for creativity, except for the rights of the child, the workload of the teacher, and student potential. Pearson correlation confirmed significant positive and negative correlations between the dimensions of attitudes toward inclusive education and teaching for creativity. The results of multiple linear regression analysis with the Stepwise method revealed that at least two dimensions of teaching for creativity had a significant impact on dimensions of teachers' attitudes toward inclusive education.

1. Introduction

The idea of inclusive education gained global recognition with the declaration of the Salamanca Statement in 1994. In the second chapter of the declaration, the definition of inclusive education was encapsulated as follows: "Individuals with special educational needs should be able to attend mainstream schools, where a child-centered teaching approach is in place to cater to these needs" (UNESCO, 1994). As Florian (2014) explains, inclusive education is an educational method striving to ensure that every student, regardless of their abilities, disabilities, or any other attributes, receives equitable opportunities and assistance. Inclusive education is an ambition for many countries in their strive to incorporate students with disabilities or diverse educational needs into mainstream classrooms and provide quality education for all (Ahsan & Sharma, 2018; Moosa et al., 2022). While it offers numerous benefits, inclusive education faces several obstacles, such as teacher shortages (Ainscow et al., 2006), lack of teacher training (Ahsan et al., 2013), and negative attitudes toward students with disabilities (Beacham & Rouse, 2012; McHatton & Parker, 2013; Parasuram, 2006). The attitudes of both pre-service and in-service teachers toward inclusive education are crucial to its effectiveness as they have a substantial impact on the implementation and robustness of inclusive practices. Furthermore, teacher's attitudes can shape the

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relationships, actions, and teaching methods, which directly affect all students, including those with special needs (De Boer et al., 2011).

Attitudes toward inclusive education refer to the inclination for either welcoming or excluding all students in regular classrooms and implementing any required adjustments to support them (Saloviita, 2015). Within school settings, the attitudes of pre-service teachers toward inclusive education can profoundly influence teaching practices, and the success of these practices. Those with positive attitudes often exhibit more confidence in their capacity to teach and manage a diverse set of learners. Conversely, those with negative attitudes may lack confidence and perceive themselves as less competent to navigate the complexities of an inclusive classroom, thereby compromising their effectiveness (Avramidis et al., 2000; Sariet al., 2022). Pre-service teachers who view inclusive education positively are more inclined to employ innovative teaching strategies and adjust the curriculum to cater to the diverse needs of their students (Sharma et al., 2006). As Jordan et al. (2010) highlighted, teachers with positive attitudes are more likely to cultivate a supportive and nurturing environment that promotes student learning. Hence, fostering positive attitudes in pre-service teachers can be key to achieving successful inclusive teaching practices.

In teaching practices, teaching for creativity is needed as a key factor to create supportive learning conditions in an inclusive teaching environment. Teaching for creativity refers to teachers' abilities and strategies to foster and develop students' creative thinking (Rubenstein et al., 2013). Rubenstein's perspective on teaching for creativity emphasizes the importance of teacher self-efficacy, environmental encouragement, societal values, and student potential in the classroom context (Rubenstein et al., 2013). In addition, by nurturing creativity, educators can foster an inclusive learning environment where every student, regardless of their background, abilities, learning styles, potential, or motivation, feels valued, included, and empowered (Ghanizadeh, 2017; Starko, 2013). Moreover, creativity in teaching equips teachers with the ability to address broad differentiation and cater to students' individual learning needs. When pre-service teachers incorporate creativity into their teaching practices, they can adapt their instruction to align with diverse learning styles, approaches, strengths, and interests, thereby making learning activities more effective and accessible for students with special needs (Tomlinson, 2014; VanTassel-Baska & Stambaugh, 2005). Starko (2013) further suggests that a creative teaching-learning style can stimulate student engagement and motivation, leading us to infer that such an approach can create a learning environment that is both enjoyable and compelling.

Approximately 240 million children aged 0–17 are living with disabilities worldwide. The East Asia and Pacific region has around 43.1 million children with disabilities, making it the second-highest in the world, after South Asia with 64.4 million. According to the 2018 RISKESDAS data in Indonesia, 3.3 % of children aged 5–17 have disabilities, and this prevalence is consistent across both genders and urban and rural areas (UNICEF, 2023a). Children with special educational needs (SEN) often struggle with learning due to various disorders and disabilities, such as dyslexia, dyscalculia, dyspraxia, visual impairment, hearing impairment, physical impairment, autism, intellectual disabilities, and others (Akter & Kuntoro, 2011; Sari et al., 2022; UNICEF, 2023b). Schools that provide Special Educational Needs (SEN) programs offer support in the classroom where teachers collaborate with enrichment coordinators, specialist teachers, and learning support teachers. This helps students with numeracy, literacy, and overall development. Moreover, individualized attention is given to students who require it. Specialized programs, designed for students with SEN, are delivered by skilled specialist educators and teachers who offer tailored support and instruction. Additionally, school counselors play a critical role in assisting students with personal development and improving their social skills when necessary. (Ajisuksmo, 2017; UNICEF, 2023a)

Despite the crucial impact of teachers' attitudes toward inclusive education and the incorporation of creativity in teaching, there is a notable absence of comprehensive research exploring the relationship between these two constructs, especially in Indonesia. Inclusive education remains a significant challenge within the Indonesian education system, where students with disabilities or diverse needs are mainstreamed into regular classrooms, often without adequate supportive facilities. While the Indonesian government has made strides toward advocating for inclusive education through legislation and policies, persistent issues remain. These include a scarcity of resources, such as appropriate infrastructure and sufficient funding (Ajisuksmo, 2017; Lintangsari & Emaliana, 2020) as well as a lack of adequately trained teachers capable of meeting the diverse needs of students (Hadis, 2005; Rasmitadila et al., 2022; Subasi Singh & Akar, 2021). Additionally, negative attitudes and perceptions of students with disabilities which refer to their inability following school program and activities continue to act as barriers to their full participation in education (Alghazo et al., 2003; Sari et al., 2022). These challenges complicate Indonesia's efforts to fully realize inclusive education and ensure equal access to quality education for all students.

In Indonesia, teacher preparation for inclusive education at the university level encompasses a holistic strategy encompassing coursework, hands-on training, and practical exposure. It is imperative for universities to enrich their curricula to guarantee that prospective educators undergo thorough training in inclusive education. Furthermore, universities have the potential to offer continuous professional development opportunities to nurturing educators, bolstering their continuous evolution and progression in inclusive teaching methods (Kurniawan & Nurhasanah, 2020; Kurniawati et al., 2012). By endowing educators with the requisite expertise, abilities, and outlook, universities can play a pivotal role in fostering the effective execution of inclusive education within educational institutions. Several studies have conducted investigations related to teacher attitudes toward inclusive education. Primary teachers' attitudes research has been conducted by Kurniawati et al. (2012) that confirmed that a specific training program is needed to improve teacher attitudes toward inclusive education. Rasmitadila et al. (2022) confirmed that the mentoring program at the university level affects teachers' perceptions of inclusive education. However, we cannot find studies that examine teaching for creativity with Indonesian pre-service teachers. Therefore, rigorous research is needed to provide the practice and policy, namely Indonesian Government and higher education institutions, with evidence to guide the preparation of pre-service teachers by investigating their attitudes toward inclusive education and teaching creativity. As pre-service teachers will serve as future exemplars in the successful implementation of inclusive education practices in Indonesia, research on that relation can be enriching.

In line with the stances explained above, this study aimed to scrutinize the role of teaching for creativity and attitudes toward

inclusive education among pre-service teachers within the Indonesian context. The dimensions of teaching for creativity, including teacher self-efficacy, environmental encouragement, societal values, and student potential, will be examined to discern their influence on attitudes toward the dimensions of inclusive education, namely, expected outcomes, rights of the child, teacher workload, and the value of inclusion. The study also explored various demographic factors, such as gender, age group, university type, and teaching experience, to determine if they lead to significant differences in terms of attitude to inclusive education and teaching for creativity.

1.1. Theoretical background

Previous studies have examined attitudes toward inclusive education and teaching for creativity separately. De Boer et al. (2011) found that while teachers display positive attitudes toward inclusion, they often express concerns about their relevant skill sets, support systems, and knowledge base. In research on pre-service teachers, Lambe (2011) and Killoran et al. (2014) revealed similar findings, demonstrating that pre-service teachers have positive attitudes toward inclusive education but lack adequate training and knowledge at the higher education level, underscoring the necessity of further training to better understand inclusive education. This finding aligns with Swain et al. (2012), who stated that after taking a special education course during teacher training, pre-service teachers' attitudes toward inclusion improved.

Although attitudes toward inclusive education and teaching for creativity have largely been explored as separate domains, some research provides insight into their interplay. For instance, Starko (2013) and Tomlinson (2014) suggest that teachers utilizing creative teaching methods are more likely to exhibit positive attitudes toward diversity in their classrooms. These teachers are better equipped to understand, appreciate, and adapt their teaching methods to accommodate diverse students in their classrooms. Moreover, there is supporting evidence for a relationship between the dimensions of the constructs targeted in this study. Avramidis et al. (2019) noted a correlation between positive attitudes toward inclusion and higher levels of teacher self-efficacy, an aspect of teaching for creativity. Additionally, McLeskey et al. (2014) identified that inclusive practices in the United States are associated with a school-wide culture of collaboration, represented by teacher societal values, and environmental encouragement, demonstrated by strong administrative support and professional development. Hence, we theorize that teaching for creativity can influence attitudes toward inclusive education, and this study aims to shed more light on the two.

Despite limited data and findings related to attitudes toward inclusive education and teaching for creativity in the Indonesian context, the influence of background variables on both targeted dimensions has been tackled by various studies in other contexts. For example, De Boer et al. (2011) confirmed that female teachers in primary education tend to express more positive attitudes toward inclusive education than male teachers. The university training type can also affect pre-service teacher attitudes in implementing inclusive education practices. That is, pre-service teachers who receive training with a strong inclusive education component at a private or public university have a highly positive attitude toward inclusive education (Ahsan et al., 2013; Sharma et al., 2006, 2008). Based on age group, Avramidis and Norwich (2002) found that younger teachers can more easily adapt to inclusive education practices because of their exposure to updated training programs and pedagogical approaches. Avramidis and Kalyva (2002) found that teachers with more teaching experiences at inclusive schools tend to attain positive attitudes when teaching students with special needs. In terms of teaching for creativity dimensions, a meta-analysis review by Ma (2009) identified no significant gender differences in teaching for creativity, but we assume that this finding may depend on the context and structure in which the creativity dimensions were assessed. University environments also play a pivotal role in encouraging teaching for creativity (Lin, 2011). In addition, Kaufman and Beghetto (2009) confirmed that experienced teachers may utilize more innovative methods, leveraging their comprehensive knowledge of teaching principles and skills in overseeing classroom activities. Specifically, they may adopt more creative strategies due to their extensive pedagogical knowledge and classroom management skills. However, the researchers also found that novice teachers may bring innovative perspectives to their classrooms.

Although the importance of teacher attitudes in shaping teaching practices and promoting inclusive education is well known, there are limited investigations of pre-service teachers' attitudes toward inclusive education and teaching for creativity in the Indonesian context. Two studies, Wibowo and Muin (2018) and Ajisuksmo (2017), investigated inclusive education practices in Indonesia. Both used qualitative methods and provided very limited information about the measurement instruments while Djone and Suryani (2019) reported on teachers' perspectives using semi-structured interviews to investigate inclusive education. Suryoputro et al. (2023) and Setiawan (2017), on the other hand, conducted an investigation on teacher creativity in Indonesia, where creativity can be influenced by income, experience, and academic qualification. However, there was no specific investigation into how teaching for creativity affects attitudes toward inclusive education. This gap in the research hinders our understanding of the challenges that pre-service teachers in Indonesia may face in implementing inclusive education, and it also makes it difficult to develop targeted strategies to address any issues that may arise. Therefore, there is a pressing need for more studies to investigate the creativity and attitudes of pre-service teachers toward inclusive education in order to support the successful implementation of inclusive education practices.

Inclusive education in Indonesia is designed to deliver high-quality education to all students, including those with disabilities, enabling them to partake in the same scholastic programs and activities as their counterparts. This method acknowledges the diversity in student needs and offers customized support to guarantee that each student can achieve their maximum potential (Djone & Suryani, 2019; Sari et al., 2022; UNICEF, 2023b). The evolution of inclusive education in Indonesia has been shaped by shifting societal attitudes toward individuals with disabilities, the implementation of creative teaching practices, advancements in pedagogy and educational technology, and the escalating significance of education in fostering economic and social growth (Hadis, 2005; Lin, 2011; Sari et al., 2022; Suryoputro et al., 2023). However, the enactment of inclusive education in Indonesia faces hurdles such as insufficient funding and resources, inadequate teacher training, and a shortage of accessible facilities and materials (Narayan & Petesch, 2002; Wibowo & Muin, 2018).

1.2. The present study

This study investigated the relationship between teaching for creativity and attitudes toward inclusive education in the Indonesian context. We explored whether there are differences between pre-service teachers' attitudes toward teaching for creativity and toward inclusive education based on various background factors such as gender, age group, university status, and teaching experience. The university status consists of public and private universities. Public universities in Indonesia are funded and operated by the government, either at the central or regional level. Private universities in Indonesia are privately owned and funded by non-government entities, including religious organizations, educational foundations, or individuals. In addition to the relationship between teaching for creativity and attitude toward inclusive education, we expect that some dimensions of teaching for creativity have significant positive effects on attitude toward inclusive education. Accordingly, the following research questions were raised:

1. Do male and female pre-service teachers differ in attaining teaching for creativity and attitude toward inclusive education?
2. Are there any university type differences associated with teaching for creativity and attitude toward inclusive education?
3. Are there age and teaching experience group differences associated with teaching for creativity and attitude toward inclusive education?
4. What is the relationship between teaching for creativity and attitude toward inclusive education?

2. Materials and methods

A quantitative methodology was employed by utilizing descriptive and inferential statistics within a cross-sectional framework.

2.1. Participants

The sample comprised 459 pre-service teachers from both private and public universities across Indonesia. Participants are general pre-service teachers consisting of STEM and non-STEM majors in Indonesian universities who have taken a semester course of inclusive education in their study program. Data were collected through an online survey, and participation was completely voluntary. All the participants provided written consent regarding their agreement to participate prior to the submission of their responses. In order to ensure the confidentiality of the participants, their identities and affiliations were anonymized prior to the analysis. Table 1 shows a detailed demographic breakdown of the pre-service teachers who participated in the study.

2.2. Instruments

The Teacher Attitudes toward Inclusive Education Scale (TAIS) was adapted from Saloviita (2015) to measure the participants' attitudes toward inclusive education. The TAIS questionnaire utilizes a five-point Likert scale from 1 (very disagree) to 5 (strongly agree) with four dimensions. Expected outcomes (3 items) are the desired educational outcomes and learning goals that teachers aim to facilitate for their students. Rights of the child (2 items) assess teachers' perspectives on ensuring access to quality education, creating a safe and supportive learning environment, and respecting the voice and dignity of every child. Teacher workload (3 items) refers to the volume of responsibilities, tasks, and demands they experience in their professional roles. This may include lesson planning, instruction, assessment and grading, interactions with students and parents, administrative duties, and professional development. Inclusion as a value (2 items) reflects teachers' commitment to fostering an inclusive educational environment that embraces and values diversity. There are a total of 10 items with six reverse questions. The reliability of the TAIS was high, with Cronbach's alpha values ranging from 0.81 to 0.90 (Saloviita, 2015).

In addition, the Teaching for Creativity Scale (TCS) was adapted from Rubenstein et al. (2013) to measure dimensions that influence teachers' perspectives on using their creativity in the classroom. The TCS includes four dimensions. Teacher self-efficacy (5 items) examines teachers' self-perceived competence in fostering creativity in their students. Environmental encouragement (3 items) assesses how teachers view their immediate environment, particularly the school environment in which they work. Societal values (4

Table 1
Demographic profile of pre-service teachers.

Demographic characteristics		*f*	*(%)*
Gender	male	210	45.8
	female	249	54.2
Age	less than 21	154	33.6
	21–25 years old	262	57.1
	more than 25 years old	43	9.4
University type	state	335	73.0
	private	124	27.0
Teaching experiences	never	371	80.8
	less than 1 year	53	11.5
	more than 1 year	35	7.6

Note. *N* = 459, SD = Standard deviation.

items) measure teachers' perceptions of the broader importance of creativity to society at large and assess their views on the general value of creativity in any field or endeavor. Lastly, Student potential (4 items) assesses teachers' perceptions of students' potential to develop their creativity. The TCS has a total of 16 items with a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree) and four reverse-choice questions. Items in the TSC dimensions have wording that reflects the creativity that teachers possess for teaching practices. For example, *Teaching creative thinking is one of my strengths, I am able to increase my students' ability to create unique solutions*, or *My current school environment places little value on developing students' creativity*. The reliability of TSC was high, with Cronbach's alpha values ranging from 0.83 to 0.93 (Rubenstein et al., 2013).

In this study, both scales were translated using back-and-forward translation in Indonesian and English by two language experts and one expert in educational sciences. The background questionnaire was added to collect related participant information such as gender, age group, university type, and teaching experience. The data were cleaned and inputted into Statistical Package for the Social Sciences (SPSS) Software version 27 (IBM Corp, 2020). However, the data from reversed items were re-coded for analysis purposes.

2.3. Data collection procedures

The procedure for data collection was done via an online invitation form disseminated through the Indonesian Teachers' Association Network group and a dedicated WhatsApp group for Indonesian teachers and teacher aspirants using random sampling. Ethical clearance to use the questionnaire was granted by the Institutional Review Board (IRB) of the University of Szeged. The participants accessed the questionnaire via a link to the Platform, which outlined the study objectives and included an option for individuals to join the study voluntarily. This link could be opened using various internet browsers such as Firefox, Safari, Chrome, and others. Prior to initiating the questionnaire, the participants were required to read through the instructions and provide their consent to participate in the study. After that, data containing person identification were coded to provide anonymous data, and all participants' data were transformed into an SPSS file.

2.4. Data analysis

SPSS version 27 (IBM Corp, 2020) was utilized to perform descriptive and inferential statistics. The raw data from the online form with the Likert scale were cleaned and converted into an SPSS dataset. The reliability was assessed using Cronbach's alpha (α). The mean (M) based on dimensions, standard deviation, skewness, and kurtosis were also evaluated to give descriptive information and ensure data normality. Descriptive statistics were used to describe the participant demographics. The inferential statistics, *t*-test with effect size by Cohen's *d* (Cohen, 2013), and one-way ANOVA were applied to assess group differences based on background variables. To investigate the relationship between the dimensions of teaching for creativity and attitudes toward inclusive education, Pearson correlation and multiple linear regression analysis with the Stepwise method were used.

3. Results and discussion

3.1. Reliability analysis and data normality

The results of reliability analyses were obtained by computing Cronbach's alpha (α) values from all dimensions in the instrument. Table 2 presents the reliability results based on scales and dimensions.

Table 2 verifies that the adapted instrument (i.e., the Indonesian version) attained a high reliability value based on Cronbach's alpha (α) values ranging from 0.75 to 0.95 for all dimensions. At the instrument level, TAIS and TSC have Cronbach's alpha (α) values above 0.7, indicating the acceptable category (Taber, 2018). These findings are in line with the previous reliability test results with the acceptable category for TAIS (Saloviita, 2015) and TCS (Rubenstein et al., 2013), even though in this study the score range is different. To ensure the data attain normality distribution, skewness and kurtosis were evaluated for all dimensions and the instrument level. The results show that all dimensions and the instrument level fall into the threshold area from –3 to +3, which confirms the data have normal distribution shapes (Field, 2013; Hair et al., 2019; Tabachnick & Fidell, 2019).

Table 2
Reliabilities and descriptive information used in the used instrument.

Scales	Dimensions	Cronbach's alpha (α)	*M*	SD	Skewness	Kurtosis
TAIS	Expected outcomes	0.75	3.98	0.71	−0.59	−0.32
	Rights of the child	0.80	3.92	0.89	−0.67	−0.04
	Workload of the teacher	0.85	3.27	0.98	0.03	−2.11
	Inclusion as a value	0.84	3.75	0.79	−0.24	−0.06
	Instrument level	**0.79**	**3.73**	**0.63**	**−0.06**	**0.13**
TCS	Teacher self-efficacy	0.91	3.83	0.74	−0.32	−0.28
	Environmental encouragement	0.95	3.25	0.53	−0.04	0.93
	Societal values	0.91	4.57	0.68	−2.11	2.46
	Student potential	0.77	3.81	0.71	−0.06	−0.56
	Instrument level	**0.84**	**3.86**	**0.43**	**−0.90**	**1.99**

Note. N = 459, M = Mean, SD = Standard deviation.

3.2. Gender differences

Regarding the first research question on possible gender differences among the pre-service teachers, a *t*-test was applied to compare all dimensions in TAIS and TCS. As Table 3 shows, there are no significant differences between the female and male pre-service teachers, but based on the mean scores, we can assume that female pre-service teachers have higher scores compared to male pre-service teachers in all dimensions. These findings are in line with previous reports in the Asian context (China) by Malinen et al. (2012)) that confirmed there are no significant differences in attitudes toward inclusive education based on gender. However, this result is contrary to findings in the Western context for primary teachers, as De Boer et al. (2011) stated that female teachers have more positive attitudes toward inclusive education compared to male teachers.

In the teaching for creativity domains, there are no significant differences based on gender for all dimensions, as presented in Table 3. These results corroborate a previous study in a similar context. Namely, Cheung (2012) verified that there are no gender differences in the implementation of creativity teaching strategies between female and male teachers, indicating female and male teachers equally use creative elements in their teaching activities. A recent study in the Asian context (China) by He and Wong (2021) announced similar results concerning creativity and teacher self-efficacy. The results on gender differences in this study reveal no significant differences between male and female undergraduate students, but the mean score of male students is higher than that of female students in attaining creativity in teacher self-efficacy. In general, the findings in the gender comparison of teaching for creativity and attitude toward inclusive education present similar results from previous studies, especially in the Asian context.

3.3. University type differences

To answer the second research question, a *t*-test based on university type was used to determine whether there are any differences between private and public universities on the dimensions of teaching for creativity and attitude toward inclusive education. Table 4 shows that there are significant differences on several targeted dimensions, such as expected outcomes and inclusion as a value from attitudes toward the inclusive education domain and for teaching for creativity domains such as environmental encouragement and societal values. Moreover, based on the mean score, we confirm that pre-service teachers at private universities outperform their counterparts at public universities for all dimensions of teaching for creativity and attitude toward inclusive education.

These findings align with those of Martin et al. (2012), Sharma et al. (2013), and Baumfield and Butterworth (2007). Sharma et al. stated that teachers in private schools display more positive attitudes toward inclusive education because they have better access to teaching materials, extensive support, and small class sizes. Martin et al. (2012) also informed that private institutions in higher education and at the school level have more autonomy, allowing them to adapt and implement new approaches in teaching and learning methods and to foster environments that encourage creativity in teaching. On the other hand, Baumfield and Butterworth (2007) stated that private institutions often attain flexibility and independent curriculum development programs to foster creativity in teaching.

3.4. Age and teaching experience groups

Concerning the third research question, the teachers were divided into three groups, based on age and teaching experiences, as presented in Table 1 previously. The groups for age were less than 1, 21–25 years old and more than 25 years old while the groups for teaching experience were never, less than one year and more than one year. A one-way ANOVA was applied to check the differences between groups. The results confirm there are no significant differences between age groups based on the dimensions and instrument level for creativity and attitude toward inclusive education, TAIS [$F (2, 458) = 0.65$, $p > .05$], TCS [$F (2, 458) = 1.97$, $p > .05$], Expected outcomes [$F (2, 458) = 0.28$, $p > .05$], Rights of the child [$F (2, 458) = 0.80$, $p > .05$], Workload of the teacher [$F (2, 458) = 0.26$, $p > .05$], Inclusion as a value [$F (2, 458) = 2.11$, $p > .05$], Teacher self-efficacy [$F (2, 458) = 2.48$, $p > .05$], Environmental encouragement [$F (2, 458) = 0.77$, $p > .05$], Societal values [$F (2, 458) = 1.17$, $p > .05$], Student potential [$F (2, 458) = 0.17$, $p > .05$].

A one-way ANOVA was also applied to determine if there are significant differences among the teaching experience groups. The results confirm that there are only significant differences based on pre-service teaching experiences on the rights of the child [$F (2, 458) = 7.56$, $p < .001$]. The other dimensions and the instrument level showed no significant differences between teaching experience

Table 3
Comparison of male and female pre-service teachers.

| Dimensions | Males | | Females | | | | | | 95 % CI of Cohen's *d* | |
	M	SD	*M*	SD	*F*	*t*	*p*	Cohen's *d*	Lower	Upper
Expected outcomes	3.99	0.72	4.00	0.71	0.05	0.32	0.75	0.03	−0.15	0.21
Rights of the child	3.90	0.89	3.91	0.88	0.01	−0.43	0.66	−0.04	−0.22	0.14
Workload of the teacher	3.27	0.98	3.30	0.96	0.39	−0.02	0.99	0.03	−0.19	0.18
Inclusion as a value	3.73	0.8	3.83	0.78	0.03	−0.59	0.55	−0.06	−0.24	0.13
Teacher self-efficacy	3.88	0.73	3.82	0.75	0.54	1.54	0.12	0.14	−0.04	0.33
Environmental encouragement	3.23	0.49	3.31	0.56	0.65	−0.69	0.49	−0.06	−0.25	0.12
Societal values	4.51	0.73	4.62	0.63	6.08	−1.63	0.11	−0.15	−0.34	0.03
Student potential	3.77	0.71	3.82	0.70	0.04	−1.15	0.25	−0.11	−0.29	0.08

* Note. *N* = 459, *M* = Mean, SD = Standard deviation.

Table 4
Comparison based on university type.

Dimensions	Public university		Private university		F	t	p	Cohen's d	95 % CI of Cohen's d	
	M	SD	M	SD					Lower	Upper
Expected outcomes	3.94	0.72	4.11	0.68	0.27	−2.37	0.02	−0.24	−0.45	−0.04
Rights of the child	3.90	0.89	3.96	0.88	0.24	−0.63	0.53	−0.07	−0.27	0.14
Workload of the teacher	3.25	0.95	3.33	1.04	2.45	−0.75	0.46	−0.08	−0.29	0.12
Inclusion as a value	3.7	0.81	3.89	0.7	3.16	−2.42	0.02	−0.24	−0.44	−0.03
Teacher self-efficacy	3.79	0.77	3.91	0.65	0.06	−1.64	0.1	−0.16	−0.37	0.05
Environmental encouragement	3.21	0.54	3.33	0.49	2.53	−2.14	0.03	−0.22	−0.42	−0.01
Societal values	4.52	0.73	4.69	0.52	12.49	−2.75	0.01	−0.25	−0.45	−0.04
Student potential	3.78	0.71	3.89	0.69	0.05	−1.58	0.11	−0.16	−0.37	0.04

* Note. $N = 459$, M = Mean, SD = Standard deviation, statistically significant differences are shaded, $p < 0.05$.

group, TAIS [$F(2, 458) = 1.53, p > .05$], TCS [$F(2, 458) = 2.35, p > .05$], expected outcomes [$F(2, 458) = 0.88, p > .05$], Workload of the teacher [$F(2, 458) = 2.79, p > .05$], Inclusion as a value [$F(2, 458) = 2.58, p > .05$], teacher self-efficacy [$F(2, 458) = 2.91, p > .05$], environmental encouragement [$F(2, 458) = 1.09, p > .05$], societal values [$F(2, 458) = 0.37, p > .05$], student potential [$F(2, 458) = 2.07, p > .05$]. These findings accord with previous studies (e.g., De Boer et al. (2011) and Gokdere (2012)), which likewise found no significant differences based on age or teaching experience. Similarly, in the domain of teaching for creativity, Beghetto (2013) and Cheung (2012) stated that age and teaching experience did not have significant effects on teacher implementation of creative teaching in the classroom context. However, the results of this study perhaps cannot be generalized worldwide or to different educational contexts because we cannot attain comparable sample sizes at the group level for age and teaching experience as background variables.

3.5. Correlation and regression between the dimensions of teaching for creativity and attitudes toward inclusive education

Pearson correlation showed the relationship between dimensions of teaching for creativity and attitudes toward inclusive education. Table 5 presents the correlation coefficients from the dimensions of teaching for creativity and attitudes toward inclusive education.

Understanding the relationship between each dimension of teaching for creativity and attitudes towards inclusive education has significant implications for students' learning experiences. The relationship between these two factors can be observed through the lens of teachers' attitudes towards inclusive education and their approach to fostering creativity in the classroom. Several studies have highlighted the importance of teachers' attitudes towards inclusive education in the successful implementation of inclusive practices (De Boer et al., 2011; Dukmak, 2013; Efendi, 2018; Humaira et al., 2021; Klassen & Tze, 2014; Kurniawati et al., 2012; Schwab & Alnahdi, 2020; Skaalvik & Skaalvik, 2017; Yada & Savolainen, 2017). Table 5 confirms that the teacher self-efficacy dimension shows a positive impact in all dimensions of attitudes toward inclusive education, indicating that pre-service teachers with high creativity in teaching will attain positive attitudes toward inclusive education that may affect their teaching practices. Table 6 shows that at least two dimensions in teaching for creativity have a significant impact on each dimension of attitudes toward inclusive education with R^2 values ranging from 0.11 to 0.24.

The environmental encouragement and societal values dimensions confirm positive effects on all dimensions of attitudes toward inclusive education except for the workload of the teacher. In addition, the student potential dimension has a negative effect on the workload of the teacher dimension. These findings indicate that most pre-service teachers in Indonesia assume that teaching students with special needs will add to their workload. Dukmak (2013) found that teachers feel a lack of training and skills in dealing with students with special education needs, which results in increased stress and workload for them to find and prepare appropriate learning resources. Similar results in the Indonesian context are confirmed by Efendi (2018) and Humaira et al. (2021). They argued that teachers in Indonesia often feel inadequately prepared to teach students with disabilities, leading to increased stress and perceived workload, and the teachers hope for additional training and support to ease their perceptions and workload. Kurniawati et al. (2012) also stated that teachers in Indonesia often experience a lack of support from school administration in implementing inclusive education, further exacerbating their sense of increased workload in teaching students with special needs.

Generally, the regression result confirms teaching for creativity dimensions affects attitudes towards inclusive education

Table 5
Pearson correlation between dimensions of teaching for creativity and attitudes towards inclusive education.

	Teacher self-efficacy	Environmental encouragement	Societal values	Student potential
Expected outcomes	0.33**	0.27**	0.42**	0.15**
Rights of the child	0.18**	0.11*	0.33**	0.01
Workload of the teacher	0.12*	0.06	0.04	−0.27**
Inclusion as a value	0.28**	0.27**	0.32**	0.06

* Note.
** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed), statistically significant differences are shaded, $p < 0.05$.

Table 6

Regression analysis to predict how teaching for creativity dimensions affect attitudes towards inclusive education dimensions.

	Influenced by	B	β	t	p(t)	R	R^2	Adj R^2	F	p(F)
Expected outcomes	Teacher self-efficacy	0.16	0.16	3.67	0.001	0.49	0.24	0.23	13.47	0.001
	Environmental encouragement	0.24	0.17	4.04	0.001					
	Societal values	0.34	0.33	7.4	0.001					
Rights of the child	Societal values	0.54	0.41	8.53	0.001	0.37	0.14	0.13	14.29	0.001
	Student potential	−0.23	−0.18	−3.78	0.001					
Workload of the teacher	Teacher self-efficacy	0.14	0.11	2.25	0.025	0.34	0.11	0.11	5.04	0.025
	Societal values	0.23	0.16	3.07	0.022					
	Student potential	−0.49	−0.36	−7.23	0.001					
Inclusion as a value	Teacher self-efficacy	0.16	0.15	3.14	0.002	0.39	0.15	0.15	9.86	0.002
	Environmental encouragement	0.22	0.15	3.34	0.001					
	Societal values	0.28	0.24	5.21	0.001					

* Note. *B*: Unstandardized regression coefficient; *β*: standardized regression coefficient; statistically significant differences are shaded.

dimensions. These results indicated that variances of dimensions of teaching for creativity can explain 11 % of the variance of rights of the child and 24 % of the variance of expected outcomes. The negative relationship between the student potential dimension to the rights of the child and the workload of the teacher dimensions may be caused by several factors, such as teachers perceiving a higher commitment to the rights of the child or experiencing a higher workload. In addition, high workload may leave teachers feeling overwhelmed, reducing their capacity to nurture student potential (Klassen & Tze, 2014; Skaalvik & Skaalvik, 2017).

Teachers with increased teaching experience typically exhibit more negative attitudes towards inclusive education (Yada & Savolainen, 2017). Conversely, positive attitudes towards inclusive education have been associated with higher levels of self-efficacy beliefs (Schwab & Alnahdi, 2020). This suggests that teachers who possess a strong sense of confidence in their ability to support a diverse student population are more likely to hold positive attitudes toward inclusive education. As presented in Table 5, we can confirm that in the Indonesian context, pre-service teachers' self-efficacy shows a positive relationship on all dimensions of attitudes toward inclusive education.

In the educational field, fostering teaching for creativity entails establishing a conducive atmosphere that encourages innovative thinking, teaching for creativity and the development of problem-solving abilities. Pre-service teachers will play a crucial role as future teachers in nurturing creativity by setting high expectations, modeling creative attitudes, and promoting flexibility and dialog in the classroom (Barbot et al., 2015). Therefore, performing an initial investigation related to how teaching for creativity and its relationship with attitude toward inclusive education can provide valuable insight into creating a supportive inclusive education environment in the university context before jumping to the school context.

In conclusion, this study has confirmed that at least two dimensions of teaching for creativity have positive relationships with attitudes towards inclusive education. Pre-service teachers who have positive attitudes towards inclusive education are more likely to foster creativity in the classroom by creating a supportive and inclusive learning environment. Furthermore, teaching for creativity requires individuals to be open-minded, flexible, and willing to adapt their teaching strategies to meet the diverse needs of students. By embracing inclusive practices, pre-service teachers are expected to create an environment that values and nurtures the creative potential of all students.

4. Research implications

Investigating pre-service teacher attitudes toward inclusive education and teaching for creativity and their interplay holds significant implications. In the context of higher education institutions, the research underscores the imperative to overhaul teacher preparation programs. It implies a need to enrich curricula by including comprehensive training on both inclusive education and methodologies for promoting creativity within the classroom. These institutions can further facilitate pre-service teachers by offering continuous professional development opportunities and fostering interdisciplinary collaboration among different academic departments. The Indonesian government can harness the insights from this research to inform educational policies. This may encompass resource allocation and funding dedicated to the enhancement of teacher training. It can also involve the enactment of legislation mandating the incorporation of both inclusive education and creative teaching practices within educational frameworks. By offering incentives to institutions that excel in these areas, the government can actively incentivize progress in this domain. Policymakers hold the potential to establish explicit professional standards that encompass inclusive education and creativity as fundamental competencies expected of educators. Moreover, they can initiate and support programs designed to facilitate mentorship and the ongoing professional development of in-service teachers. In addition to this, policymakers may allocate research funding for the investigation of effective strategies aimed at fostering inclusive education and nurturing teaching for creativity practices.

5. Conclusion, limitations, and further developments

This study has contributed to filling the gap in investigating the relationship between teaching for creativity and attitudes toward inclusive education among Indonesian pre-service teachers. In addition, the background variables based on gender, university type, age, and teaching experience were also presented to enrich the results and discussion on both teaching for creativity and attitudes

toward inclusive education. Significant differences based on university type were confirmed in several targeted dimensions such as expected outcomes and inclusion as a value within the attitudes toward inclusive education domain and environmental encouragement and societal values within the teaching for creativity domain. Pre-service teachers at private universities outperform their peers at public universities in all dimensions of teaching for creativity and attitude toward inclusive education. Positive and negative correlation coefficients were also identified from teaching for creativity and attitude toward inclusive education. The results of regression analysis show that at least two dimensions in teaching for creativity have a significant impact on each dimension of attitudes toward inclusive education.

However, there are several limitations to this study. First, the research design consisted of a quantitative analysis with a cross-sectional design. It would be engaging to perform a mixed method with longitudinal data collection. Second, the age and teaching experience groups do not contain comparable sample sizes; therefore, it will be difficult to generalize the findings from these groups to other educational contexts. We suggest that future research use more participants, including in-service teachers. Third, this study uses only correlation and regression analysis because of the lack of previous research to compare each dimension as a latent factor in complex modeling. In addition, there is no causal analysis of confounding factors or background variables to the main constructs. Therefore, future work should attempt to build structural modeling for checking the effect of potential confounding factors on the dimensions of teaching for creativity and attitudes toward inclusive education using Structural Equation Modeling. Finally, we hope that the findings of this study can contribute to providing insight into how to prepare pre-service teachers for inclusive education and provide evidence of the relationship between creativity in teaching and teacher attitudes that can influence teaching practices in inclusive education and can be used by higher education institutions, the Indonesian government and policymakers.

CRediT authorship contribution statement

Soeharto Soeharto: Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Writing – original draft. **Seyda Subasi Singh:** Resources, Supervision, Writing – review & editing. **Fitria Afriyanti:** Conceptualization, Formal analysis, Investigation, Software, Writing – original draft.

Declaration of competing interest

The authors declare no competing interests.

Data availability

The data that has been used is confidential.

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