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Full Length Research Paper

“One man’s trash is another man’s treasure”: Graffiti and civic education among youths in Nigeria

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This paper explored the relationship between graffiti arts and civic education among young people in Nigeria. A mixed methods approach was employed to generate and synthesize empirical data. The study was guided by Barbara Rogoff's social constructivism theory. Findings indicated that graffiti arts and artists were present in Nigeria, driven by desires for self-expression, financial gain, and training opportunities sponsored by NGOs for up-and-coming artists. Writing styles varied, but drawing, mural painting, and styles uniquely African remained dominant. Despite the difficulty of acceptance of graffiti as an art form due to its earlier association with transgressive activities, its engagement as a method for emancipatory, participatory, cultural literacy, dialectical relations, and creative learning tools in both formal and informal settings demonstrated its educational-supportive capacity for young adults. The values that graffiti express can help reorient young adults in their thinking and social agency. To this end, this paper recommends rethinking the way we view and relate to graffiti arts and writers; incorporating graffiti art education into school curriculum reforms in Nigeria; and using an interactive approach, including new media, to understanding graffiti art produced and displayed by young adults.

Keywords: Graffiti, alternative art practice, civic education, pedagogical strategies, participatory learning.

INTRODUCTION

The pursuit of civic education is a fundamental human right that aims to help learners become responsible and active global citizens, contributing to a more peaceful, tolerant, inclusive, and secure world (United Nations, 2015). Failure to educate young people about the principles and values upon which democratic institutions and social life are founded can pose a serious threat to their well-being and the welfare of human societies in general. As a process that privileges the transfer,

acquisition, and modification of one's knowledge, skills, values, attitudes, behaviour, and worldviews, learning is now done in a number of ways (traditional, social, media, etc.) and within different settings (institutionalized or non-institutionalized). While the process has traditionally been driven by strategies often seen as too abstract, argumentative, or teacher-centered, new sets of learning proposals (or theories) recognize the need to draw on approaches that may not necessarily be termed as

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conventional, but which are sometimes considered as student-driven, dialogical, radical, or even subversive. The use of graffiti arts or writings for teaching and learning falls under this latter strategic category. In contrast to most classroom learning activities that are abstract in orientation and often out of context, graffiti can offer the opportunity for learning that is contextually situated, liberating, and empowering. As argued by Xu (2017), children's graffiti, in particular, are language symbols rooted in the creation of culture and art; they can bear out children's inner world and serve to stimulate their latent consciousness and train their abilities. Thus, the ability of street arts to grow physical and mental prowess for learning is no longer a marginal debate in scholarship.

Focus on the graffiti art itself and its communicative and sociocultural values within the academia is also extensive over the years (Al-Khawaldeh et al., 2017). Yet, in a number of Euro-American and African societies, graffiti making is still approached and regulated as a criminal activity, making the adventure of appreciating the intermediality between graffiti art and education look seemingly impossible or inappropriate in view of the sustained negative view about graffiti subculture across a number of societies.

Rioch (2021) shows how the London boroughs in the UK spent a large financial budget over time to provide countermeasures against graffiti on surfaces and to mitigate the perceived graffiti problem. However, there has been increasing critique of attempts by some corporate organizations and governments to commercialize graffiti for sociopolitical and economic gains. These attempts have been critiqued for potentially placing restraints on the creative and editorial capabilities of graffiti writers, as well as for being counterproductive towards the realization of the 'civic' agenda of graffiti writers and the industry (Zhyhailo, 2022).

Approaching contemporary graffiti through the framework of visual culture with emphasis on its creative, social, aesthetical and, more importantly, its educational or pedagogical values, it is argued, could redress the age-old criminal tag and allegation often placed on the art *genre* all over the world, as well as place graffiti culture on a more favourable and competitive footing with professional art *genres* and for usages in public institutions and family homes for more productive teaching and learning outcomes, particularly for young adults. In fact, what appears like a trash for a few, when appreciated and properly used, could become a treasure of knowledge for many.

That said, it is rather unfortunate that till now (regardless of the extensive scholarly works that have already been undertaken on different aspects of street arts), there is still a large gap in knowledge and unexplored aspects relative to the appropriation of graffiti as a significant pedagogical tool within the context of youth education particularly in Africa. Increase of

research in this subject area in Africa, it is argued, could reposition the importance and strengthen the necessity of graffiti art as well as broaden the possibilities for the restoration and conservation of graffiti and street arts particularly for sustained usage in schools and family homes as an unavoidable artistic mechanism for the transfer and reception of knowledge outside the mainstream. This research aims at minimizing this existing gap in knowledge and to reassert the importance of this particular art form often seen as subversive, transgressive, and radical to knowledge building and transfer, both at its institutionalized (or formal) and noninstitutionalized (or informal) settings. The focus of the study is not on the 'form' of the graffiti art or on the aesthetics of the art form itself or on the process of graffiti writing; rather it is principally on the functional connection between graffiti and advancement in civic education, particularly in Nigeria.

The objectives of the study, therefore, include the following:

1. to ascertain the presence of graffiti as an art form in Nigeria and their locations;
2. to establish the specific writing style and format that dominates the artistic practice in Nigeria;
3. to understand how an art form considered radical and subversive could still be used for educational purposes;
4. to streamline the values that graffiti writings seek to express and how these can help address some of the challenges faced in the education sector in Nigeria; and,
5. to establish the contextual issues to education in Nigeria that would make the adoption of graffiti writing for teaching necessary.

THEORETICAL FRAMEWORK

Barbara Rogoff's social constructivism theory, propounded in her book *The Cultural Nature of Human Development* (2003), is adopted to provide conceptual strength and direction for this research. As a subset of the broader constructivists' educational theory which comprise cognitive (Jean Piaget), social (Lev Vygotsky), and radical (Ernest von Glasersfeld) elements (wgu.edu/blog), Rogoff's social constructivism, focusing on different cultural communities, examines the relationship between sociocultural processes and human development (including educational development), in terms of ways of thinking, remembering, reasoning, and solving problems. While her focus is specifically on sociocultural and historical contents to development, she also makes assertions pertaining to children's learning behaviour in culturally constructed social learning environments.

Rogoff's theory places emphasis on 'context' and 'situation' in learning and encourages interactions

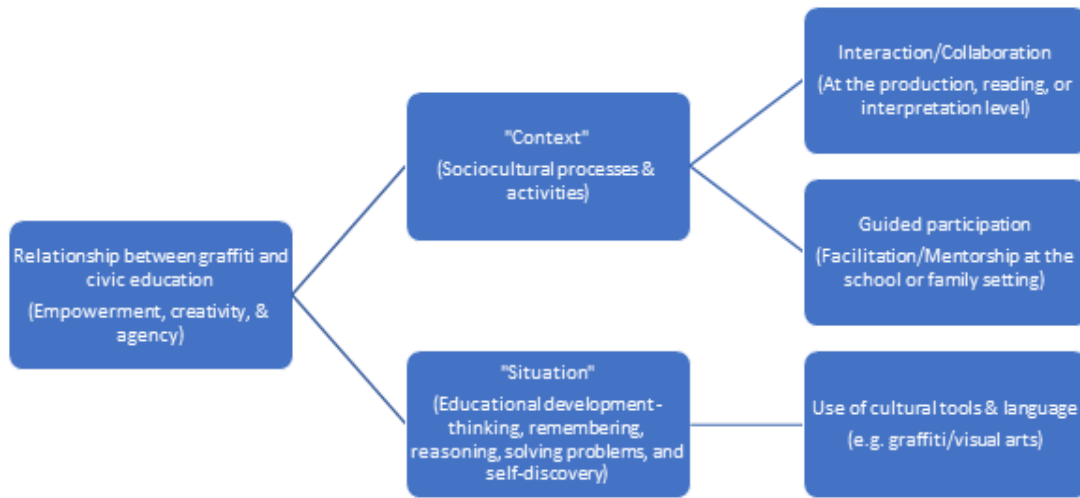


Figure 1. Conceptual variables.
Source: Authors.

between individuals and situation. The theory does not focus on a child's own innate ability, but rather indicates that skills are developed in specific social contexts and learnt through specific cultural activities. It emphasizes that learning should be accomplished through interaction with others and outside experiences (including visual experiences). Being children- (or students-) centered, it recognizes the need for children (or students) to reflect and devise their own methods of solving problems but in a collaborative way. Rogoff's theory is not limited to academic learning, it can be stretched to address visual-based or recreational learning that is artistic in nature.

Of great significance to this research, however, is her idea of "guided participation" (2003: 282) which suggests the collaborative transfer of knowledge between a guide and an apprentice, or a caregiver and a child, or a teacher and a student. For Rogoff (2003), children on their developmental path use cultural tools and language with skilled mentors to shape their development. This understanding, when seen within the context of this paper, indicates the kind of collaboration that ought to sustain the teacher-student or parent-child relationship regarding the use of graffiti for learning. Such relationship should/could be shaped by the liberality and guardianship necessary for a good use of this alternative art form in learning. In a collaborative and guided transfer of knowledge between a teacher and student or a parent and child, the interactions, as Rogoff suggests, must be bridged in a synchronistic way. Children and mentors should structure learning opportunities in such a way that they share understanding both verbally and non-verbally.

When this theoretical model is applied to shape particularly visually-based environment for learning in schools and family homes, the likelihood is that it would

lead to increased creativity, the ability of students to take more collaborative risks in learning and the freedom to explore subject fields in different ways, including alternative visual artistic ways.

A summary of the different conceptual directions through which Rogoff's theory could be stretched and applied to the field of visual arts and graffiti writing culture in particular, is provided in Figure 1. Being originally developed within the field of culture vis-à-vis human development study, this summary, therefore, provides fresh conceptual dimensions in which the applicability of the theory to the field of visual arts within the context of this paper could be assessed.

GRAFFITI: ALTERNATIVE ART FORM AND SUBCULTURE

Defined as "writing or drawings scribbled, scratched, or sprayed ... on a wall or other surface in a public place" (www.oxfordlanguages.com), graffiti constitute a form of visual communication and a subculture. Though sometimes referred to as 'aerosol art', or 'graffito' (Curry and Decker, 2020), or 'spray can art' and 'subway art' (Ganz, 2021; Gottlieb, 2008), graffiti is an art form that falls within the broader field of alternative art practice or amateur radical expressive art [or what Hess and Mulyana (2022) refer to as "low-technology modes of communication"], which is different from the mainstream or the professional art. Ganz (2021), Curry and Decker (2020), and Gottlieb (2008) are in agreement that the word was derived from the Italian word *graffiare*, meaning "to scratch". The English equivalent of 'graffiti' connotes a plural sense of the Italian *graffito* (a singular form). Ganz

(2021), in particular, notes that the word was first used by archaeologists around the year 1850 to describe inscriptions discovered at ancient antiquaries and archaeological sites.

Historically, literature on graffiti differentiates among ancient, medieval, and contemporary (or modern) graffiti. Ancient graffiti were exemplified in the writing activities of the early caves' men in Africa, France, and Spain, who left drawings on the walls of their caves (Ganz, 2021; Black, 2014), as well as in the remarkable inscriptions, drawings, and markings found in some cities of the Greco-Roman world (Cyrus, 2022; Allison, 2015).

Medieval graffiti and street arts were, in turn, predominantly exemplified in the religious inscriptions, quotations, scratches on sculptures, and drawings found around religious centers that told the stories of outstanding religious figures, as well as in some popular literatures of the era circulated particularly in Britain and medieval Asian cities (Ross, 2016a).

Contemporary graffiti writing, however, emerged in the 1960s with the radical artistic activities of Darryl "Combread" McCray and his colleagues at the correctional facility in Philadelphia. This was followed in the early 1970s by the gang "tagging" art that emerged and gained popularity in New York (www.sprayplanet.com). By mid-1970s, graffiti "tagging" had grown to become a regular activity of street gangs across a number of Euro-American regions for a variety of purposes (Curry and Decker, 2020). Some of these radical writings even found their way into some art galleries; and, thus, paved way for graffiti writing to be gradually considered as an art form. Today, graffiti writing has achieved a monumental presence on the world stage and have exerted influence on popular culture, including music, film, television, and even fashion (Ross, 2015). The emergence of the Internet and graffiti blogs has aided their publicity across the world; thus, positioning graffiti writing as a global movement with shared "philosophies, techniques, and roots" (Ganz, 2021: 1).

The purpose of contemporary graffiti writing, apart from its ornamental function (Schacter, 2016), varies. Principally, they enable *self-expression* by the artists and to pass on important messages in a visual or even hip-hop music or children's games' formats, etc. These messages could fall into broad categories, including social or political commentary, or personal communications (Gottlieb, 2008). A few, however, seek to convey only the identities of the graffiti artists by expressing their stylized signatures or pseudonyms. In fact, graffiti has also become a means of selling, advertising, or promoting brands or anything that has connections with performing arts. Their installations at public places in urban areas as campaign tools have also been recognized in scholarship (Gottlieb, 2008). For Hess and Mulyana (2022), their purpose is also very much tied with mediation in the "interests of counter publics" (p. 1). In other words, graffiti can function to

support citizens' dissent and protest against all forms of marginalization or neglect. The extensive use of graffiti for the expression of emotions, counter-political views and renegotiation of ideological positions during the Egyptian revolution of 2011 is an illustration of their counter political potency (Aljazeera, 2021; Sharaf, 2015; Saber, 2014). Taylor's (2012) writeup also shows that a number of young adults engage in the trade today, not only to express a non-conforming social identity, but to gain recognition, high reputation, and the respect of the community.

Scholarly debates about the types, styles, nature, and legitimacy of graffiti writing are, however, still ongoing. In terms of format, graffiti could take on the form of drawing, painting, lettering and writing, or a combination of any of the four (Cyrus, 2022). Scholars are hardly in agreement on a unified graffiti typology arrangement. Literature evidence shows a wide range of categorization schemas, ranging from a three to four types categorizations, to an eight to ten and then twelve to eighteen types arrangements. Gottlieb (2008), however, provides a categorization order that is more systematic and relevant only for the technical interpretation of stylistic languages.

This paper, however, adopts the typological list provided by Ian (2021), whereby graffiti types are broadly reduced to eight, namely, *tags*, *throw-ups*, *blockbuster*, *wildstyle*, *stencil*, *heaven*, *piece*, and *3D graffiti*. Each category displays established technical and aesthetical elements that are meaningful and understandable to the graffiti art community and are expressive of specific graffiti art styles. Apart from its usefulness for understanding the borders of graffiti as an expressive art, the typological classifications, in varying ways, also problematize a number of other issues, such as the social functions and the legality of graffiti (Melbärde et al., 2022). Our attention is on the former, not on the latter. Thus, while the identification of the visual characteristics of each type and style is also highly significant in the critical analyses of graffiti subcultural practice, clarifying their social functions and acceptability within the broader political communities is of basic concern.

At the base of the legality consideration of graffiti practice is the distinction between graffiti as an art and graffiti as vandalism or subversive or anarchic practice (Zhou, 2022; Conklin, 2012). Curry and Decker's (2020) view is that graffiti writing is both a radical practice expressive of the need to gain attention and an expressive art form that is legitimate. These contradictory points of view have remained the constant in the debates about and appreciation of graffiti in the contemporary times. But, as argued by Gottlieb (2008), the writings and drawings that comprise graffiti today are more varied and sophisticated than one might expect, making it even more challenging for graffiti to be classified into a single category of vandalism or subversives. Ross (2016b) shared the same view. The author admits too that gang graffiti has since diminished and has been "predominantly

supplanted by art-related graffiti and street art” (p. 11). That notwithstanding, the treatment of graffiti negatively or positively has created a certain sense of ambiguity about the practice that may be difficult to wipe away instantly. While the sense of ambiguity holds the reason for understanding decades of misunderstanding that had existed between graffiti writers, citizens, and government with regards to the usage of urban spaces for self-expression by street artists, study (Safonov et al., 2022) shows that such ambiguity could be resolved contextually when graffiti writing meets up or fails to meet up with certain local expectations.

Safonov et al. (2022) findings in relation to the urban city of Saint-Petersburg, shows that graffiti writing sometimes considered as illegitimate could gain legitimacy on the basis of their representational values, surface of display and content of the graffiti in question. The authors’ argument, therefore, tend to suggest that the logic of legitimacy or illegitimacy is no longer sacrosanct in the contemporary era in relation to graffiti writings and displays; the rule could change either way based on graffiti’s ability to meet up with certain political, social, or cultural expectations. The concept of ‘space’ has remained another key consideration in the debates about graffiti (Christensen and Thor, 2017; Ehrenfeucht, 2014; Taş and Taş, 2014). A synonymous term found in scholarly researches is that of ‘city’ or ‘place’, whereby the city is conceived as the canvass of a new generation of street artists (Christensen and Thor, 2017; Evans, 2016; Conklin, 2012). In other words, though a few graffiti may be found in local communities where people’s marginal life-styles and neglects have pushed them to adopt this form of art practice to express their anger, graffiti writing is today particularly prominent in major urban centers throughout the world. The common canvass targets include subways, billboards, street walls, surfaces in schools, prison walls, bridges, abandoned factories, toilet walls, and private residential spaces, just to mention a few.

The understanding of ‘space’ in relation to graffiti writing, however, differs in scholarship. Lesh (2022), for example, re-conceptualizes ‘space’ from its earlier meaning as “venues of writing” to its understanding as ‘social relations spaces’ that graffiti writers make to happen. In this regard, the focus of analytical attention moves away from the physical texts and their messages to the community’s social engagements, in different contexts, around (or within) the venues of graffiti writing. Hochman (2006: 200), in turn, ties the concept of space to the interpretative “in-between” or the ‘Third Space’ in relation to graffiti writing. The Third Space comprises the ‘physical’ and ‘dialectical’ where the graffiti practice occurs. While the physical is the performative space where young people physically write to broaden the scope of educational environment, the dialectical is a reflective space, a unique space that belong to the youth and where the youth have a total control of its

pedagogical elements. It is neither a school nor a home, but it is the special interpretative relationship being fostered between graffiti writers and viewers. It is, however, a combination of both the physical and dialectical that “constitutes a fertile ground for educational projects and initiatives” (Hochman, 2006: 200). Ehrenfeucht’s (2014) concept of “private property” provides another dimension of the meaning of ‘space’. In this regard, space could also be conceptualized as an arena of tension and contestation, informed by the reality of space ownership and control struggles across societies. Any attempts to circumscribe the rights of graffiti artists in utilizing private spaces could result in disputes and claims over property transgressions, resulting sometimes in a protracted anti-graffiti controversy and activism, which in turn could opened up new debates on the importance of street arts and broader galvanization of support to renegotiate with property owners for the placement or removal of graffiti from private property. Thus, in the history of graffiti space formations, the public space has, according to Ehrenfeucht (2014), remained an area of contestation between civil society, graffiti artists, and the state. How this tension is or has been mitigated also depends on the kind of approach adopted by either of the parties.

That said, the debates on graffiti and all aspects of the alternative art form have not reached any finality. They are still ongoing. They are also becoming increasingly interdisciplinary. Within the academia itself, graffiti study is still being approached from a number of angles, including history and culture (Aguilar-Garcia, 2022), criminology (Md Sakip et al., 2016), commercial (Zhyhailo, 2022), political (Lennon, 2022; Hess and Mulyana, 2022), urbanization (Goba, 2019), linguistic (Moghaddam and Murray, 2022), religious (Allison, 2015), psychoanalytic (Myllylä, 2022), as well as tourism (Melbärde et al., 2022) and pedagogical (Hochman, 2006) perspectives, just to mention a few.

In spite of these broad and diverse approaches, the study of contemporary graffiti from the perspective of formal and informal education among youths is still relatively thin particularly in Africa, compared to researches carried out in other areas of graffiti study. This is where this paper makes another significant contribution to the body of knowledge already available, but from the Nigerian context. The pedagogical value of graffiti, it is argued, requires greater exploration, deep reflection and sustained application to assist teaching, on the one hand, and learning among young people, on the other.

GRAFFITI AND CIVIC EDUCATION

Education, as a social process of knowledge transfer and reception either within a school setting or at home, entails subjective or collective engagements in the act of

teaching and/or learning. Education becomes 'civic' when it is directed at the learning interest/right of the people resident in a particular place, town or city or geared towards the empowerment of a particular political community or sociocultural group (Cambridge Advanced Learner's, 2008: 244). The variables for a successful civic education plan in context are, however, extensive and interrelated. They include the type of political regimes (democratic, hybrid, and authoritarian) available to the citizens, the curriculum and policy formulations put in place, and the concept of good citizenship which is tied with people's personal experiences (Li, 2021). Strandbrink (2017), however, highlights the ambiguities that often strain standardized visions of civic education across democratic societies, in terms of the uneasy relationship between normative education expectations for liberal democracy (where education becomes cosmopolitan and tolerant) and statehood's interest in reproducing educational prerogatives that prevailed in restricted cultural environments. Where the restricted cultural prerogatives prevail, the author argues, civic education becomes parochial and intolerant of difference and the educational regimes' appropriated tools could become a resource for activism among young people. The link between education and graffiti has been carefully established by a number of authors (Xu, 2017; Avramidis and Drakopoulou, 2015/2012; Christen, 2010; Harris, 2006). The authors generally admit that graffiti proliferation in urban visual landscapes now offers "an alternative space where writers educate one another" (Avramidis and Drakopoulou, 2012: 1), enabling young adults to become critically aware of their education situation. As noted by Christen (2010), without such alternative artistic expressions, "many more urban kids would have become entangled in violence and crime". Graffiti writing now provides them with "knowledge, skills, and values important for success in the mainstream" (p. 1). These authors, apart from problematizing the concept of public education, have provided inroads into the benefits of the complex and contested visual educational process that comprise learning outside schooling.

Also, the institutionalization of graffiti art as subcultural and entertainment practice in social settings of primary and higher education sectors through the allocation of writing spaces considered as legal, though not a global experience, is now also a recognizable practice in a number of countries and local regions, including Nigeria. How these institutionalized art practice actually contributes to reflections by members of school communities on social and academic life as well as their historico-political experiences remains an area of continuous investigation in scholarship (Al Lily and Alzahrani, 2015). Graffiti writing within the institutionalized setting has, however, been applied across a wide range of subject fields both in social and natural sciences, making the relationship between graffiti and formal education multidisciplinary.

That notwithstanding, the importance of graffiti art to civic education includes, its value as a liberating and emancipatory media subculture (Christen, 2010), its importance as 'participatory art-based method' for capacity building (Marovah and Mkwanzani, 2020); its value as a 'cultural literacy art' (Mangeya, 2018); and its interpretative value for viewers within the context of the 'physical-dialogical' interface (Hochman, 2006). Others are its multicultural methodology whereby graffiti sustain an interface between class, social distinctions, and communicative actions (Rodríguez-Valls et al., 2012); its ability to convey meanings "in specific cultural context" (Cassar and George, 2017); and the variations in the thematic focus they suggest for learning, just to mention a few (Figure 2).

Liberation and emancipation logic, in particular, problematizes the development of the agency capacity of young adults, especially their freedom and ability to think, negotiate and act with less constraints and in a way that brings them inner satisfaction and sociocultural commitments. Harris (2006), for example, locates the liberating potential of graffiti in the democratic spaces they create for open exchange of ideas, dialogue and negotiation among young adults on sociopolitical issues. Xu (2017), in turn, indicates the cognitive dimension. Beyond offering a way for children to express their inner world and reveal their real feelings, graffiti writing in children's art education could, essentially, cultivate their imagination, affect their thinking habits, and explore their creative abilities. This, in the long run, could lead to increased academic success, deeper cultural awareness, and the development of life in the future. Xu (2017), therefore, recommends the need to create good graffiti environments in children's art practices in schools, to introduce graffiti writing as the starting point of children's art education, and for teachers, as mentors, to facilitate and guide graffiti training, as well as collaborate with their students to interpret their graffiti works with them. These recommendations, apparently, align well with Rogoff's (2003) social constructivism, particularly her interactive and guided participation logics.

The exploration of the thematic trajectories of graffiti writing by Fania (2014) and Ta'amneh (2021) from the Iranian and Jordanian contexts, respectively, is indicative of the kinds of values espoused by graffiti and that could help socialize young adults or reinforce already existing values, agency, and worldviews. Ta'amneh's (2021) study of 207 written graffiti on the walls and desks of public secondary schools shows that displayed values fell into three thematic categories, namely, religious, political and emotional, with the emotional as the dominant theme. Fania's (2014) earlier study of 200 pieces of graffiti displayed on classroom walls suggests a broader thematic range, including religion, history, politics, love and hatred, poetry, presence, despair, complaint, and signature, among others. Corroborating the thematic dimension, Şad and Kutlu's (2009) study of prospective

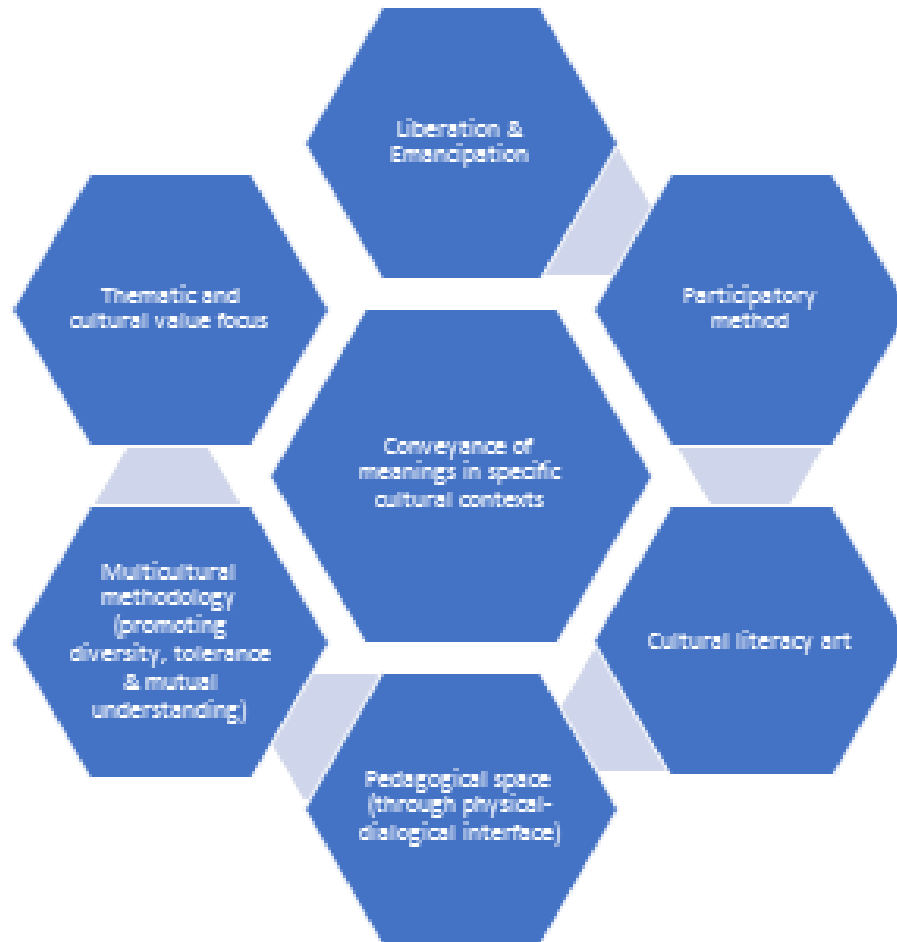


Figure 2. Importance of graffiti arts to civic education.
Source: Authors

teachers' graffiti writings on lavatory and classroom walls reveals such additional themes as belongingness, homesickness, romance, humour, name and doodling.

The importance of new media to the use of graffiti for improved civic education is also recognized in scholarship. A number of authors (Kondakova and Shtifanova, 2022; Laffier and Bowman, 2021) have explored the use of diverse digital technologies to grow digital street arts and graffiti so as to advance learning, social movement of street art projects, and change in the urban environment. The shift towards signature graffiti subculture on virtual spaces and the configuration (or re-configuration) of vernacular networked learning is also gaining prominence and recognition in recent times. As argued by Avramidis and Drakopoulou (2015), this development problematizes "the role of technology in connecting and mediating various learning and communication practices" (p. 1). Important to both the academic and arts communities now is, therefore, how contemporary information and communication technologies have engendered new network capacities

for the promotion of connections or interpersonal interactions between graffiti writers, apprentices and mentors, and between graffiti communities and learning resources (Avramidis and Drakopoulou, 2015). In view of this development, the integration of digital technologies into pedagogical strategies that employ street arts of different kinds as well as the value of digital technologies to the growth of learning within digitally created artistic environments should no longer be ignored or taken with levity.

METHODS OF THE STUDY

Mixed methods approach that drew on the strengths of both theoretical and statistical data to address research objectives was adopted for the study. The adoption was informed by the different nature of the research objectives, some of which required qualitative responses and others quantitative. While qualitative strategy served as the dominant orientation of the study, quantitative strategy provided only complementary aid. In this regard, *oral interviews*, *documentary studies* and *survey* served as the chosen methods for the study. Samples were selected through

the *purposive* and *dimensional* processes of the *non-probability* sampling procedure. While the *purposive* element allowed the researchers to choose samples that would best meet the purpose of the study, the *dimensional* specified all the dimensions of interest in the study and ensured that most of them were represented by at least one respondent (Ihejirika and Ornego, 2013). The *scope* of the chosen samples was, however, meant to take care of the various items to be addressed, rather than its representativeness (Ghosh and Chopra, 2003:307). For oral interview, a total of four respondents were chosen; two (Jesse Josh Goje, a prolific street artist based in Kaduna and Ernest Ibe, a professional artist domiciled in Lagos) to represent the graffiti art community; one from the academia (Dr. Efiog Eyefoki of the Department of Fine Arts of the University of Uyo) to represent the higher educational sector, and one from the Ministry of Education (Mrs. Okama Amos, Director of Schools in the ministry in Calabar) to represent the sector that coordinates and manages educational affairs in Nigeria. For the survey, 105 students from two secondary schools (Government Technical College, Mayne Avenue, Calabar South and Government Secondary School, State Housing, Calabar Municipality) were sampled to represent students' perspective in the study. The students surveyed were between the ages of 10 and 29 years. Out of the one hundred and five surveyed, 50 were male and 55 were female. Additional information was sourced from six published documents (that is online newspapers) on aspects of the topic. The importance of documentary study rested on its supplementary data provision to enable the authors make up for gaps in information obtained from oral interviews and survey. The questions for the interviews (oral and written) were decided on the basis of the needs of each of the conceptual variables (independent, dependent and contextual) and, accordingly, developed to respond to the demands of these variables.

FINDINGS AND DISCUSSION

Findings from empirical study are presented here in response to the objectives of this study, as outlined in the introductory section of the paper.

Presence of graffiti art form and their locations

Most of the interviewees acknowledged the presence of graffiti arts in Nigeria. Ernest Ibe and Jesse Goje specifically admitted that they practiced graffiti writing for expressive, recognition, reputation, and pecuniary purposes. Ibe, for example, noted that he has had a number of his graffiti published, including the "E No Balance" huge colour painting he made to represent issues of violent crises, particularly the killings in Southern Kaduna, as well as a piece he made for CAFOD Foundation to address the issue of religious tolerance. According to Ibe, "I grew up in my own area in Lagos. I see a Muslim girl and a Christian girl holding hands. So, you just get to know that there's a kind of communication; there's peace, harmony and understanding. This understanding needed to be passed across to Nigerians by leaving them with a long-lasting impression, as well as help the kids grow up with that mindset of collaboration and peacemaking" (Interview, 2022). That work, incidentally, stood out from among all

the paintings he had done between 2018 and 2021. Goje, in turn, stated that graffiti writing was one of his majors. He did a number of murals and graffiti installations for "I Create Africa" and for Kaduna State government at Murtala Square, Kaduna. He noted, "I have a lot of artistic works that I have done, government and private jobs, as well as freelancing for private residences. Mural, however, remains my main area. I do not just go and mess up walls; I do mostly commissioned jobs" (Interview, 2022). Some of Goje's artistic works had, incidentally, been displayed a few times on the pages of *Daily Trust*, a Nigerian national newspaper, as well as by the *Nigerian Television Authority* (NTA).

Empirical data further showed that, apart from Ibe and Goje, there were a number of other prominent graffiti writers as well as uprising ones spread across the country. These included Okunkolor Osadolor (also known as "Osa Seven"), an established graffiti and mural artist in Lagos and the owner of *Kuma Nation* and *Art for a Cause* initiatives, used in popularizing graffiti art in Nigeria and volunteer-based community development, respectively. There was also Sarah Sanni, a self-taught female aerosol and mural artist that operates between Lagos and Ibadan and owner of *Cera Cerni's Hub*, used for training young artists. These artists "are doing very well and have covered large spaces" (Goje, Interview, 2022). A number of young people were also being trained and encouraged to join the graffiti art movement by the well-established ones and some were getting paid for showcasing their talents. Goje admitted training over 45 youths in Kaduna that were now good at the practice. Some of the graffiti artists were, however, in the trade just to make money, using the same art form to express political, environmental, and cultural considerations of governments or government agencies in exchange for a pay: "I personally got paid over 10million naira for the job at Murtala Square, the biggest ever paid job I received".

Again, respondents admitted that there were some Non-Governmental Organizations (NGOs) that were funding the artistic practice in Nigeria. These organizations gave grants to the established artists to enable them to give attention to those kids that wanted to learn the trade, "because the kids just want to be happy". The graffiti artists interviewed, however, warned that looking down on graffiti artists in Nigeria because they were seen as amateurs or people simply in need of cheap recognition and money, would never bring out the best in them or make them compete in an equal footing with their professional counterparts.

As to the specific locations of this art form in Nigeria, Lagos, Abuja, and Kaduna were mentioned by respondents as the most popular places. Calabar, Benin, and Uyo were also mentioned. Eyefoki, in particular, stated that graffiti writings could be located in public facilities generally - on the university campuses, hotels, restaurants, and on nursery or secondary school walls. Out of the 105 secondary school students surveyed,

Table 1. Knowledge and use of graffiti.

Measuring Variables	Yes (%)	No (%)	Do not Know (%)	Total
Heard of the word 'graffiti'	52.4	41.9	5.7	100
Seen graffiti on any wall in Calabar	83.8	14.3	1.9	100
Used by teachers to teach in schools	74.3	20.9	4.8	100
Students' preference of art works for lessons	88.6	5.7	5.7	100
Students' preference of direct talk for lessons	28.6	64.8	6.6	100
Student's use of art works to explain things	35.4	60	4.6	100

Source: Authors.

83.8% acknowledged the presence of graffiti and street arts even in Calabar; 52.4% claimed they have only heard of the word 'graffiti'; only 41.9% have never heard of it, while 14.3% have never seen any on the streets in Calabar (Table 1).

Interviewees, however, differentiated among graffiti, murals, and street arts. While it could sometimes be difficult to differentiate between street arts and graffiti, as both could be done on street walls, interviewees agreed that graffiti, generally, were writings or inscriptions or images on the walls – streets, buildings, prisons, classrooms, cars, buses, trains, etc.; and murals were paintings and relief sculptures displayed indoors or on the walls of houses where people live. Street arts, in turn, could be on any public background and people could see them when they walk on the road. The messages communicated by these different *subgenres*, interviewees admitted, could be picked up by simply looking at the art works or through intuition and intellectual imagination. Eyefoki noted the incitement that came with such readings, "I am an artist. Sometimes I would give assignments to students and expect them to be able to decipher what a given drawing, sculpture or painting depicts. There's joy always when the students get it right".

Critically, the association of graffiti practice with commerce has already raised concerns within scholarship (Zhyhailo, 2022). It has generated contradictory positions, ranging from cooperation to condemnation. It has also raised concern as to whether graffiti practice is actually a genre of artistic expression or mere advertisement (Ibegbunam, 2012). Apart from the social dynamics graffiti presence on a legal wall fostered, the opposite idea was either that of the artists working out of personal love for painting or being hired to paint to earn a pay despite their natural love for painting.

Zhyhailo (2022), in particular, revealed not only the meaning of the dynamics of the monetization behaviour of the graffiti artists themselves, but also the possible tension that such commercialization attitude could bring to bear on the graffiti cultural industry itself. This paper, however, shares Zhyhailo's view that the monetization of graffiti should not be condemned outright, but that the very interpretation of such behaviour should be based on

the degree of the writers' interaction with business agents and political authorities. Again, the possibility of governments and funding agencies attempting to undermine the radical and civic empowerment tendencies of the alternative art practice through commerce and for purely sociopolitical gains should never be overlooked by the artists, as the fund providers might also intend to control, even indirectly, the aesthetic styles and editorial powers of the graffiti artists themselves. Graffiti artists should, therefore, remain mindful of the kind of closeness they sustain with political authorities or the kind of financial gift they enjoy from them, that is, if they must protect the integrity of their practice (Okon, 2017). Again, legal artistic painting must not always be seen as a free activity. Graffiti writers can demand for the rights to develop their work based on a decent pay or financial reimbursement. It is, therefore, important for people to change their thinking about graffiti practice as a free trade zone. We should also consider the right, capacity, and readiness of the artists to make a living out from the art practice.

The critical argument notwithstanding, the presence and locations of graffiti writings have been well established in this subsection, as empirical data have supported that graffiti arts were truly present in Nigeria and across a number of locations.

Specific writing style and format that dominate the artistic practice

The writing styles commonly identified by respondents included writing, painting, drawing, relief sculpture, engravings, lettering, graphic and relief graffiti. Findings further revealed that the most dominant styles in Nigeria were the lettering and painting styles. 38% of the students surveyed, however, identified painting, while another 38% picked drawing as their most preferred styles in schools and at home (Table 2). 41% of the students, however, indicated that graphics were the dominant styles often displayed on their classroom walls, while 38% showed the same for family homes (Table 2). Eyefoki, in contrast, preferred painting as the dominant style, because painting involved colours which were

Table 2. Preferences and types used in schools and homes.

Measuring variable	Students' art works preference in schools (%)	Children's art work preference at family homes (%)	Can you name anyone you have at home (%)	Can you name anyone you have in school (%)
Sculpture	14.3	1.9	0	0
Painting	38	28.6	14.3	12.4
Drawing	10.5	38	13	9.5
Ceramics	4.8	17.1	14.3	3.8
Graphics	28.6	9.5	38	41
Textiles	0	0	9.4	9.5
Do not know	3.8	4.9	11	23.8
Total	100	100	100	100

Source: Authors.

sensually and emotionally impactful. He tied his choice of style to the question of 'meaning' or 'art-purpose': "The particular meanings I seek to express through graffiti writing generally derive from the principle of art-purpose. Thus, the meanings expressed may be to showcase, amuse, symbolize, or advertise something for sale" (Interview, 2022). Goje, in turn, observed that the kind of graffiti one could see in a place like Kaduna was no longer the vandalism type; and only a few of the writing and lettering formats were on display. He identified his own personal style as "Afro Urban Art Fusion". The style was defined by the bringing together of geometry, colours that had urban appeal, facial markings, and writeups that were truly African. This kind of format did not need too many words or a typical graph in it: "Basically, I express the African narratives for people to see the lines and know that this is where I came from and this is where we all started from" (Interview, 2022).

For Eyefoki, "the group of people expected to benefit most from my graffiti paintings were artists, businessmen, church goers and a cross-section of the public in and outside Uyo" (Interview, 2022). Goje, on the contrary, targets everyone. He has no specific group(s) in mind as the expected beneficiaries of his graffiti designs: "All humans should get messages, should be happy, should see colours, they should see designs that will make them reminisce, that will inspire them, which will trigger their own creativity and make them happy. My works basically heal all categories of people; I concentrate on the healing aspect" (Interview, 2022).

Interviewees also agreed that often approvals were required from the owners of surfaces anywhere in Nigeria to be able to put out any visual writing either on private walls or street walls. As a matter of fact, sociopolitical and legal arrangements in Nigeria required the adoption of this approach to avoid problems.

Regardless of their purposes or target audiences or even unique *Africanization* of graffiti, empirical data had, therefore, identified painting, drawing, graphics, and murals as the most dominant graffiti styles in Nigeria,

both within and outside schools. Lettering and writing formats were also there but their presence was relatively not so pronounced.

Usefulness of graffiti as a radical and subversive art form for educational purposes

Grffiti have, to some extent, been viewed as subversive art often used for radicalism and to challenge authorities. Interviewees, however, admitted that graffiti, though still subversive, were not necessarily used for vandalism or anarchism in the contemporary Nigeria. They have mostly been used positively to serve a number of sociocultural and politico-economic needs of communities. Eyefoki, in particular, argued that "although they were often used as a lighter mode of expressing some serious concerns by way of caricature or satire, they were also equally used objectively to teach about history, political and cultural considerations of a community". He gave Fela Ransom Kuti's musical score, "Na Baba kill Dele. If you add 'Ngida', na you sabi", as a good example. Ibe and Goje also agreed that vandalism defined how graffiti started as an art form, bearing such messages as "fuck the police" or "fuck the government". It was used then mostly by people who were not well educated or who found themselves at the margins to express how they were fed up with a particular thing or persons as well as demand for change: "They knew how to use words, signs and symbols to pass messages to their targets. And when such messages were well passed, the community benefited from it. But if the messages were that of chaos, the community risked being torn apart. It was this negative aspect that informed attacks on graffiti artists in certain regions" (Goje, Interview, 2022).

The respondents further affirmed that good graffiti arts often blended with the proper street arts to canvass for cultural preservation and progress. Goje for example, stated, "...graffiti writing has really changed. A lot of

works I did in the wake of the killings in Southern Kaduna, caused by the invasion of the Fulani bandits into the communities and the uncaring attitude of the state government, were really objective. But because the whole scenario was unnerving, I and my boys asked for permission to use available spaces and someone allowed us to use his wall where we created a piece to show the people's anger and pains and the need for government and stakeholders to do something" (Interview, 2022). Getting permission and understanding the need for 'balance' to avoid problems, he argued, was allowed. How to create that balance between the need of the community and the commitment to challenge or make a bold statement in an objective way to avoid chaos, Goje noted, was left for each artist to decide. He added, "It was only when graffiti artists were not responsible and did not really have the right materials that they would just use one or two spray cans and mess up a place. They just wanted attention by writing their names or something stupid" (Goje, Interview, 2022). Goje argued further that such conducts should be discouraged by paying these uprising vandals (some of whom resent going to schools) to do something more productive and get involved fulltime in the practice of culture preservation.

Ibe, sharing the same thinking, indicated that graffiti writing, most often, belongs to the realm of the masses. The whole ideology of governance for years had been portrayed as a communicative movement from government to the people at the bottom. For Ibe, graffiti writing reverses the communication direction and flow, allowing the people from below to speak to people at the top on controversial issues. For him, no effective commitment to governance can exist without the masses. Graffiti writing provided one of the easiest ways for the Nigerian masses to connect with government and to provide feedbacks. He averred, "when you put graffiti writing into their game, it's going to change the game and it's going to leave them with lasting memory" (Ibe, Interview, 2022).

Ibe's view, ironically, aligned somewhat with Lesh's (2022) reading of graffiti spatiality as 'social relations spaces' that enabled communities to engage among themselves and with leadership in contexts. Such graffiti-enabled engagements should not be seen simply as venue-based, but rather as issue-based, with opportunities for negotiations or renegotiations to create mutual understanding and progress on issues of importance to the communities. Respondents were also of the view that graffiti that sometimes appeared as subversive have the potential of being used for illustration, advertisement, and even announcement. The students surveyed indicated, for example, that most often their teachers used graffiti and other visual arts for illustration of lessons (76.2%), to advertise brands (5.7%), to teach history (5.7%), and to make announcements to students (3.8%). Only 8.6% of the students were not sure of how these visuals were

specifically used by their teachers. The frequency of use by their teachers ranged from 'often' (32.4%), to 'occasionally' (36.2%), 'sparingly' (9.5%), and to 'not used at all' (21.9%) (Table 3). Eyefoki, in particular, noted that graffiti that appeared subversive were useful for academic purposes because their coded/symbolic language forms were abstracted to veil the reality of life. For this reason, they could help students to think, not just ordinarily and superficially, but to look in-depth into whatever they saw. That was to say, graffiti could ginger students' philosophical acumen to easily decode what they saw in relation to their own or other people's life experience. Eyefoki averred, "those suffering from disability, for example, could use the braille, particularly in graphic lettering to relate with the knowledge and the social realities so expressed".

For Goje, the beauty and communicative value of these visual art forms should explain their importance and ginger their uses for social and educational purposes. Even within the informal family setting, Goje admitted, graffiti and other visual images on the walls - depending too, on the kind of messages, tradition and culture the intended graffiti represented - could ginger children to learn some basic moral principles, know and respect their culture, as well as serve them as historical memory aids. Survey data also corroborated the claim to usefulness of graffiti arts to the civic education of young people in Nigeria. 75.2% of the students noted that using graffiti drawings and other illustrations could simplify lessons and minimize difficulties in understanding what they were taught both in schools and at home. Only 15.3% were not sure of how valuable this potentially subversive art could be to their learning. Similarly, 80% strongly encouraged a compulsory use of graffiti for learning in schools; only 11.4% were in the negative. Also, 49.5% of the students acknowledged that their inability to connect with what they were taught by their teachers was because of the absence or inappropriate use of visuals (Table 4).

Respondents also agreed that graffiti writing and displays can encourage the youth to work hard and make a living, as well as help in building Nigeria, by knowing and doing the right thing. Goje, in particular, argued, "For crying out loud, my paintings on the walls pass messages strong enough to inspire and encourage the young ones to become better persons; even older ones have been inspired. I have trained, almost every year, many young ones all over North-East and North-West of Nigeria, some between the ages of 10 and 13, to make their life better and become professionals. Generally, training them to be the best, makes me super good, happy and fulfilled" (Interview, 2022).

Interviewees, generally, rejected the idea of graffiti being called 'subversive'. Osa Seven, however, admitted earlier to Clegg of *This Day* newspaper (26 October 2019), that pushing graffiti for acceptance as a form of art in Nigeria was hard. Yet, graffiti, just like any other art form or media, were important for civic education,

Table 3. Frequency, purpose and types of use.

Frequency of use by teachers	%	Purpose of use in class	%	Types of visual art used	%
Often	32.4	Illustrate a lesson	76.2	Drawings	44
Sparingly	9.5	Advertise a brand	5.7	Illustrations	56
Occasionally	36.2	Make announcement	3.8		
Not at all	21.9	Teach history	5.7		
		Do not know/Not sure	8.6		
Total	100		100		100

Source: Authors.

Table 4. Understanding lessons based on arts' use.

Measuring variable	Yes (%)	No (%)	Do not know (%)	Total
Non-use of visuals creates difficulty in understanding lessons	49.5	41	9.5	100
Using graffiti and visual arts can simplify lessons	75.2	9.5	15.3	100
Making visual art practice compulsory for schools is necessary	80	11.4	8.6	100

Source: Authors.

precisely because they passed vital information, told our local Nigerian and African stories, enlightened and helped people to think and decide about issues. In this regard, graffiti would assist young people to resolve issues about culture, to treasure and preserve beautiful art pieces, as well as to respect and honour the artists themselves.

Critically, the interplay between literature and empirical data affirms that it is in the true spirit of graffiti to be provocative and to protest against exclusion and indignity of those in authority. But, as argued by Hochman (2006), we should also recognize that beyond their activist tendency, graffiti's presence on any wall generally could create opportunities for interpretation of youth-led educational experiences and harmonization of the ambivalence in the very act of interpretation of those experiences. One could access these opportunities, not consciously, but through curiosity about the meaning behind the images and the discursive dialectic within the broader graffiti community. In this regard, learning through graffiti could come, not only by viewing the images, but more importantly, by recognition of the viewers' true conditions in reference to the images. Thus, the interplay between graffiti's physical and dialectical for learning deserves the attention of educators and parents who were concerned with generating rich discussions with their students and children. That was because the interplay also suggested ways "in which education might manifest within another physical Third Spaces such as after-school programs or youth-led educational experiences outside the four walls of the classroom" (Hochman, 2006: 203) as well as issues and values that center around each graffiti art.

Empirical evidence has, therefore, established that, though subversive in nature, graffiti arts do also hold enormous learning and empowerment opportunities for young people both within and outside school settings. Graffiti could, for instance, enhance better reasoning and understanding of a subject field and/or life reality. Thus, an attempt made to ignore graffiti is still a choice made in denial of its educational significance.

Values graffiti writings express and how these can help address the challenges of education

Findings showed that graffiti writing held out a number of values to both formal and informal teaching and learning in the Nigerian context. Eyefoki streamlined these values to include illustrative, aesthetic, economic, and political values. Others were educational, historical, cultural, and sympathetic magic values. Sympathetic magic value, in particular, "is used by the occult to make contact with the ancestors". Since graffiti writings with sympathetic magic value expressions could be used to conceal what needs to be concealed, for example, class struggles among cultists, Eyefoki was of the view that such art forms could also become a means for the identification of criminals in schools and the society at large by security operatives. Graffiti artists in Nigeria also paint words meant to elicit certain moods in children and to place the country in a more positive light. Osa Seven, in an interview with Awodipe (2019) of *The Guardian*, for instance, noted, "We paint words that will inspire children, like joy, happiness, collaboration, and peace, words that will take hold in their subconscious. Also, we paint "a whole lot of

Table 5. Affiliation with art forms.

Measuring variable	Yes (%)	No (%)	Do not know (%)	Total
Do you love art works?	90.5	9.5	0	100
Do your parents love art works?	64.8	11.4	23.8	100
Do you practice drawings?	71.4	23.8	4.8	100
Has any artist been brought to teach you how to draw or write with colours?	11.4	69.5	19.1	100

Source: Authors.

vibrant, bright colours, which describe Nigerians as a people. We are a vibrant, resilient people and these colours describe who we are" (*The Guardian*, 30 October 2019). Osa's work, incidentally, "ranges from portraits of iconic characters to scenic images, brand designs, abstract art, and tribal art designs that appeal to the human emotions" (Bellanaija, 2017). Interviewees, generally, admitted that the value of graffiti writing should be of concern to those working in the ministries of education across Nigeria and other governmental agencies concerned with formal education in the country: "...they need to put more energy to respect graffiti artists and their talents all over the country, because they pass a lot of messages to the society, as well as offer encouragement to those at the margins of the society" (Ibe, Interview, 2022). Okama Amos of the Ministry of Education, however, highlighted three challenges facing the educational sector that the increasing appropriation of graffiti could help resolve. These included recognition of the important role art plays in education; the presence of teachers trained in art practices in schools to drive the practice; and encouraging regular interface of children/students with established graffiti artists. She noted that, though the ministry had a clearly spelt out policy in its curriculum for primary and secondary education in Nigeria that encourages the use of visual arts (without any specific on graffiti) for teaching and learning, the fidelity of head teachers to this guideline had always been a problem. The other was the absence of teachers well trained in art practices in these schools. She observed that teachers who studied arts most often shied away from teaching the subject. Thus, the lack of teachers with experience in visual art forms in these schools was now a fundamental problem. Again, a number of schools could hardly bring in established artists to interface with students and teachers because of the financial cost implications. Teachers, too, might not be motivated to discuss that with their head teachers knowing they might not get the necessary approval. Thus, recalcitrancy and bureaucracy in administration might also be a serious barrier.

One of the graffiti artists interviewed, however, admitted that he had been invited only a few times by the ministry of education and some NGOs in his area of domicile to speak on the importance of art works in general towards the education and formation of young

people. One interviewee claimed he had never been invited. Survey data also presented a different picture as 69.5% of the students admitted that no artist had ever been brought into their schools in the 2021/2022 session to teach them either how to draw or write with colours. Only 11.4% were in the affirmative; while 19.1% had no idea (Table 5). While the view of Amos partially agreed with the views of the students surveyed and one of the artists interviewed with regard to lack of opportunities for students to interface regularly with professional artists, her claim regarding a near total reluctance by teachers to engage with students in art education was somewhat contradicted by the students' perspective, which showed that graffiti and other visuals were occasionally used by their teachers to teach them (Table 3). Amos' claim, however, raised some fundamental issues earlier affirmed by Xu (2017) and worthy of note. These included the need for school authorities to continuously create good graffiti environments in children's art practices in schools, as well as develop the competencies required for teachers, as mentors and guides, to engage more meaningfully with students in graffiti training and interpretations. Additionally, Amos' suggestion of the need for continuous awakening as a way forward, through the creation of consciousness around the importance of graffiti and other visual forms to learning as well as the need for students' advisers and those in the counseling units of schools to help identify the art interests of students and encourage their uses to assist those students that learn better through these visual forms, should also be taken seriously.

Interviewees, nonetheless, strongly recommended the use of graffiti for education in family homes and schools in Nigeria. Eyefoki, for instance, noted "using this art form is important, because it is easier and clearer than other methods/approaches. Besides, it enhances flexibility". Additionally, "children are supposed to be made to think, rather than being always taught through the rigid formal method. Graphic artists, painters and even those in textiles would attest to the importance of pictorial arts to personal intuition and cognition even among young people" (Interview, 2022). Eyefoki added, "I have given a number of times paintings with a mixture of items to my students to test their ability in isolating and reasoning out what were actually needed for a particular assignment than the rest. It made me feel happy when they were able

to do what they were asked to do correctly” (Interview, 2022).

Ibe corroborated this position by noting that when graffiti writing had messages that addressed civic considerations, it could help to bridge the gap between hearing and seeing and could stem any form of misunderstanding in the class rooms that could possibly exist between teachers and students. Different students, he argued, had their different ways of grasping and understanding issues. There were those who understood easily through visual arts, and those who related better with direct teaching in the class. The educational system, he indicated, should be designed to take care of both perspectives, as well as introduce the study of visual arts as a major in school curriculums. Teachers too, he observed, needed to be taught on how to use these visuals for effective teaching and learning and, as mentors, to properly guide their students to decipher meanings contained in the visual texts.

Empirical evidence has, therefore, highlighted some of the values that graffiti writing could bring to bear on the learning and socialization of young adults within and outside schools, as well as how the appropriation of graffiti arts in schools and the integration of their uses into school curriculums could increasingly assist the appreciation of the educational value of this art form.

Contextual backgrounds to education in Nigeria that would make the adoption of graffiti writing for teaching necessary

Respondents also indicated that the Nigerian educational sector was facing a number of other challenges. One of such challenges was the existing gap between teachers’ approach to teaching and students’ ability to easily process what they were taught. Interviewees were also in agreement that the contextual backgrounds necessary for the adoption of graffiti writings in private homes, semi-private spaces and in schools were the ‘teacher-student’ or ‘parent-child’ or ‘master-apprentice’ context, where those at the receiving ends were taught how to be able to identify real things from fake or correct things from wrong ones. For respondents, these contextual backgrounds make the adoption of graffiti for teaching necessary across all human societies. ‘Nsibidi’, a graffiti art work popularly known to and used by the *Ekpe* cultural group, for example, could help address the ‘teacher-student’ or ‘master-apprentice’ contextual issue. Eyefoki, again, noted that the teacher-student learning gap could be bridged if a class lesson begins by teaching the abstract principles first, and then follow up with the relevant elements of graffiti art. Regardless of the approach used, teachers generally could enhance students’ ability to easily process what they were taught by not only using visual aids, but also engaging with their students in the very process of reading these art forms and in a way that

makes meaning to them.

It is, therefore, important that those working in schools as well as parents at home understand more realistically the importance of such interactive environment for creating learning around the essential information often passed on through graffiti arts and also encourage the integration of this collaborative approach into any art education design they adopt for their young adults.

The findings notwithstanding, it must be noted that there was, generally, the challenge of connecting with more respondents, particularly those in the graffiti arts community in Nigeria, as they lacked recognizable presence in both national directories and online sources. This difficulty was, however, overcome through the insights gained from one of the artists interviewed. There was also the problem of easy access to the authorities at the Ministry of Education. This challenge was mitigated through persistent efforts and reminders.

CONCLUSION AND RECOMMENDATIONS

The paper set out to investigate the relationship between contemporary graffiti and civic education of young people in Nigeria. Findings revealed that the effectiveness of civic education is dependent on the instructional methods used by teachers and/or parents. It was argued that the introduction of graffiti as a culturally situated pedagogical strategy into the process of civic education can offer a ‘new experience’ to teaching and learning, which is different from traditional experiences characterized by direct conversations between teachers and students, one-directional instruction from teachers to students, or by abstract argumentations. The study further showed that graffiti writing is not necessarily a crime or subversive in Nigeria. While it may sometimes have an illegal spatiality, it generally has acceptable pedagogical value across different educational settings. Their significance and public acceptance, however, depended on several elements including where the art was created, the value, and the message behind the art.

Critically, this perspective has introduced a new media dimension to Rogoff’s educational and interactive setting to learning, through a collaborative production, reading and interpretation of graffiti and within specific sociocultural contexts. While graffiti provide artists with the freedom to express themselves, they also offer reflective spaces forged by and for young adults. Essentially, every art is distinct and artists have unique ways of displaying their arts on surfaces, what sets graffiti apart is their exceptionally activist and interpretative potency. They can be used to incite positive changes in societies as well as critically engage people (especially young adults) on a collaborative reflective and interpretative action concerning their educational, historical, political, and sociocultural conditions. The educational significance of graffiti, therefore, cuts across

a wide range of sociocultural value orientations and subject fields. If graffiti has historically been able to represent diverse ideologies, cultural values and other socio-political considerations across cultures and times, then they should bear a certain intrinsic substance that is pedagogical in nature. There is a risk that if contemporary graffiti become indulgent in their degradation as vandalistic or subversive, they could unwittingly become politically lame artistic enterprises whereby family homes, school educators and even activists' communities might not be able to use them as vehicles for the transformation of societies and empowerment of young adults. Contemporary graffiti, therefore, have to matter; they have to have some kind of sociopolitical aesthetic, cultural and educational stake and risk. They should no longer be eschewed or taken at face value.

The interface between graffiti writing and new media has now also introduced a new dimension into the understanding of the collaborative requirement for graffiti production, reading, and interpretation. The interaction can no longer be restricted only to the classrooms or family homes or even the traditional media environments; it is now something that can also be forged by graffiti artists and teachers within those virtual and social spaces that new media now enable.

In view of these findings, the following recommendations are made:

(1) A rethink of the way and manner we see and relate with graffiti arts and writers as creators of alternative art subcultures; (2) An increasing recognition of the importance of graffiti art to civic education; (3) An appropriate and extensive use of graffiti and other visual forms to teach children and students at home and in schools across all subject fields; (4) The need to train teachers in the experience of visual art designs and graffiti education as a step to overcoming some of the challenges associated with the usage of graffiti in schools; (5) The need to specifically integrate graffiti arts education into school curriculum reforms in Nigeria; and (6) An adoption of a collaborative approach to the critique and interpretation of graffiti arts produced and distributed by young adults, as well as an increasing reliance on the opportunities offered by new media to heighten interactivity and agency in the learning and teaching processes in public schools and family homes.

For future research, however, this paper suggests an increasing application of Rogoff's social constructivism theory to the understanding of issues relating to visual cultures, an exploration of the importance of new media to the development of graffiti arts for learning in Nigeria, as well as a study on the regulation of graffiti writing in Nigeria through national and state laws and policies to stem abuses.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interest.

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Full Length Research Paper

Education for sustainable development: Investigation of preschool children's metaphorical perceptions and views regarding "global problem" concept

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This research will explore preschool children's metaphorical perceptions and views about the concept of "global problem" in the context of education for sustainable development. The study will involve 20 preschool children, who are aged between 60 and 70 months and are attending a public kindergarten in İzmir, Turkey, during the Spring of 2021-2022 academic year. The data collection process involved semi-structured interviews. Interviews were carried out with 20 preschool children on their perspectives and perceptions of 'global problem,' which was interpreted via content analysis. The findings of the qualitative analysis provided participants' perceptions and views related to global problems. The sample group was formed via convenient and criterion sampling method. The data were collected through a demographic information form and a semi-structured interview form which includes a metaphor sentence and open-ended interview questions. The results suggest that the preschool participants created themes (pillars), sub-themes and eighteen metaphors regarding the concept of "global problem" during the metaphor formation process. It was found that children's metaphors and views regarding the global problem were placed under the themes named "social-cultural", "environmental" and "economic". It was also found that the participants placed their metaphors and views regarding the "global problem" under the "social-cultural" theme most frequently.

Key words: Sustainable development, preschool education, global problem, metaphorical perception, opinions.

INTRODUCTION

Sustainability means people's ability to benefit from natural and renewable resources within the natural system by relying on their basic input over a long period of time (World Oceans Review, 2015). The concept of sustainability emerged in the middle of the 19th century,

and it was discussed in the World Charter for Nature adopted by the International Union for Conservation of Nature and Natural Resources (IUCN) in 1982 globally for the first time. This document proposes that all land, sea and atmospheric resources within the ecosystem in

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which human beings also live should be managed by maintaining the optimum level of sustainability in such a way that it should not endanger the integrity of organisms and species that live there (Yazar, 2006).

The concept of "Sustainable Development" (SD) was heard in the report entitled "Our Common Future" published by the United Nations (UN) in 1987. It was recognized by large masses in the world after the detection of the ozone hole, the reason of which is human activities, over Antarctica in 1984. In this report, sustainable development (SD) is defined as development that meets the needs of the present without compromising the ability of future generations to meet their own needs in Brundtland report (Brundtland, 1987). Regarding this report accepted by the UN General Assembly at the UN Conference on Environment and Development (UNCED) held in Rio de Janeiro, Brazil, in 1992, very important suggestions were extended by leaders from all over the world, and these suggestions were compiled and published in the Agenda 21 Report (Drexhage and Murphy, 2010 cited in Alan, 2015).

Considering the fact that the natural resources on Earth have been depleted much faster than they can be created and restored in recent years, it is seen that people frequently have to cope with intertwined issues regarding social-cultural and economic development as well as important problems affecting local, regional and global environments (Siraj-Blatchford, 2009). In this context, it was argued that SD does not only cover environmental problems but it also includes economic and social-cultural elements during the UN Conference on Environment and Development (UNCED) (1992) also called the "Earth Summit" (Agenda 21, 1992). It was later stated that the three pillars of SD, considered as "interdependent and mutually reinforcing pillars", include a) *social-cultural development*; all social, cultural and political issues that affect the quality and continuity of people's lives at the national and international level, b) *economic development*; meeting the basic needs that can reduce the dangerous burden on the environment and natural resources and efficient consumption of energy, products and materials, c) *environmental development*; awareness of biodiversity and environmental protection as well as the issues like mission to save the present and future generations and to maintain life on earth (Siraj-Blatchford et al., 2010).

SD, being a complex concept that has reached its current terminology over time, can also mean the limitations placed on the use of on present technological and socio-cultural organizations created by human actions on environmental resources (Brundtland, 1987). Therefore, regarding the problems such as global warming, poverty and inequality that resulted from human activity and that we have to cope with today, the structuring of our mental frameworks and the internalization of the concept of "sustainability" are considered very important (Elliott, 2010).

Paprotna (1998) calls for urgent action in order to protect the Earth's natural climate concerning these global problems that humanity has to cope with every day and emphasizes that this urgent need for action can only be met through the development of environmental knowledge, awareness and attitudes that instill a greater sense of responsibility for the present and future states of the environment. Bokova (2012), the former General Director of UNESCO, indicates that economical and technical solutions as well as political regulations and financial incentives are not adequate to solve the problem, and she suggests a radical change in the way we think and act, therefore she views education as the best solution to lead us sustainability (Siraj-Blatchford and Huggins, 2015). Several reports of many congresses and conferences published recently commonly suggest achieving the goals of sustainable development successfully, and they propose education as the most effective way to achieve that (Engdahl and Rabušicová, 2011; OMEP; 2022; Siraj-Blatchford et al., 2010; UNESCO, 1997; UNESCO, 2005b; UNESCO, 2005c; UNESCO, 2006; UNESCO, 2009; UNESCO, 2014).

Education for sustainable development (ESD) is a long-term process which includes educational practices regarding environmental problems, and it also includes social-cultural and economic dimensions which also motivates individuals to think and act in the framework of sustainability, and it is a process that aims to place individual activities on the grounds of equality, democracy and quality of life (UNESCO, 2005a). Therefore, UN decided to start UN Decade Education for Sustainable Development (UNDESD) starting from 2005 since the role of education was commonly accepted as an important one in order to provide a better and sustainable future for everyone during the Johannesburg Summit (2002) held by UN General Assembly (UNESCO, 2014). Subsequently, UN Decade Education for Sustainable Development international plan of action report was published by UNESCO (2005), and the plan suggested that education for sustainable development including all principles, values and actions as well as the three pillars should be integrated across all objectives and levels of education (Kahriman-Öztürk, Olgan and Güler, 2012; UNESCO, 2005b). In this respect, it is seen that education has an important role in ensuring a change towards the development of this sustainability, and sustainability should be included in the curricula of all grade levels including that of preschool children (Elliott and Davis, 2009; Pramling-Samuelsson and Kaga, 2010).

Early childhood is accepted as the most important years because the foundation set in those years' guides children until the end of their lives (Rutter, 2002 cited in Davis, 2010). Therefore, early childhood education has one of the critical roles for attaining the sustainability point of view since children's cognitive development starts or their cognitive schemas are restructured during those years. UNCED (1992) states children are an

integral part of environmentally friendly thinking processes, and they are a part of every action aiming to protect and sustain the environment. It was also emphasized that every step made to attain sustainability should consider the children's personal benefits (Agenda 21, 1992).

Several congresses were held, and several reports were written in order to define education for sustainable development and put it into practice. One of them is 7R and its theoretical frameworks was initially introduced by Our Common Future Report by Bruntland World Commission on Environment (WCED, 1987 cited in Engdahl and Rabušicová, 2011), and it was later on developed through projects that support Education for Sustainable Development practices conducted by World Organization for Early Childhood Education (OMEP) (Engdahl and Rabušicová, 2011).

When relevant literature regarding the three pillars of Education for Sustainable Development, namely social-cultural, environmental and economic pillars, as well as 7Rs were investigated (Elliott, 2013 cited in Borg, 2019; Engdahl and Rabušicová, 2011; Kahriman-Öztürk et al., 2012; Pramling-Samuelsson and Kaga, 2008) it is seen that 7Rs include the three pillars of SD and works in an integrated manner. In this respect, reduce and reuse of 7R represent the environmental pillar, respect, rethink and reflect of 7R represent the social-cultural pillar and recycle and redistribute of 7R represent the economic pillar (Engdahl and Rabušicová, 2011; Kahriman-Öztürk et al., 2012; Pramling-Samuelsson and Kaga, 2008).

Early childhood education for sustainable development can be viewed as synthesis of "early childhood education" and "education for sustainable development", and some research was conducted regarding this both in Türkiye and abroad (Alan, 2015; Ahi and Balci, 2017; Alici, 2013; Alici, 2021; Årlemalm-Hagsér and Sandberg, 2011; Ayvaci et al., 2021; Bulut and Polat, 2019; Caiman et al., 2022; Cengizoğlu, 2013; Davis, 2009; Elliot and Davis, 2009; Engdahl and Rabušicová, 2011; Feriver et al., 2019; Güler-Yıldız et al., 2021; Güler-Yıldız et al., 2017; Haktanır et al., 2012 cited in Haktanır, Güler and Kahriman, 2016; Kahriman-Öztürk et al., 2012; Korkmaz and Güler-Yıldız, 2017; Lee et al., 2019; Li et al., 2019; Palmer et al., 1999; Palmer, 1999; Popratna, 1998; Siraj-Blatchford et al., 2010; Yazar, 2006). However, there is limited amount of research in Türkiye regarding the investigation of views and metaphorical perceptions of preschool children about "sustainability" and "global problem". Findings from Davis' (2009) research titled "Revealing the research 'hole' of early childhood education for sustainability: A preliminary survey of the literature" reveals that less than 5% of the articles of the international research published during 1996-2007 covered early childhood education and Education for Sustainable Development. Therefore, it can be said that there is a need for theoretical and practical research in these two domains. Nevertheless, Somerville and

Williams (2015) updated the research findings regarding sustainability education for early childhood and found that educational activities regarding sustainability for early childhood are used increasingly. They illuminated that there was an increase in the number of researches regarding sustainability education during early childhood, and they emphasized that even though that was a new research domain the research concerning this topic has increased today comparing to the results of Davis (2009). In addition, research on the literature indicates that enough research was conducted in the field in that sound criticism may start to be extended as a result of the interaction among the research conducted with different paradigms on this topic. Güler-Yıldız et al. (2021) investigated the scientific articles on sustainability education for early childhood published during 2008-2020 stated that the mostly the environmental pillar was discussed in those articles and concluded that more research with a holistic approach including all pillars of sustainability is necessary in the future. Toran (2017) conducted a research in Türkiye on studies about sustainability for early childhood and found a limited number of studies, and yet stated there has been an increase in the number of studies in recent years. Similarly, Bulut and Polat's (2019) study entitled "The Investigation of Sustainability Concept in Early Childhood Education" published in Türkiye stated that there are not enough studies and activities focusing especially on education for sustainable development for early childhood. In this respect, it is necessary to increase the research for education for sustainable development in Türkiye, which is an emerging field of research, and it is also important to include the environmental, social-cultural and economic pillars into it.

As a result, early childhood education, being critical for the development of children's cognitive schemas, is an important step and investigating children's views and metaphorical perceptions regarding the concept of global problem in the context of sustainable development principles and goals may contribute the existing literature of early childhood education for sustainable development. Therefore, the objective of this research is to investigate preschool children's metaphorical perceptions and views regarding the concept of "global problem" in the context of education for sustainable development. In this context, the problem statement of this research is "What are the metaphorical perceptions and views of preschool children regarding the concept of the global problem on our planet?"

1. "What are the metaphorical perceptions of preschool children regarding the concept of the global problem on our planet?"
2. "What are the opinions of preschool children regarding what the global problem on our planet might be?"
3. "What are the opinions of preschool children regarding the cause of the global problem on our planet?"

Table 1. Frequency and percentage distribution of pre-school children's demographic information.

Gender	Participants	Frequency	Percentage
Girl (G)	G2, G3, G4, G5, G8, G14, G16, G17, G20	9	45
Boy (B)	B1, B6, B7, B9, B10, B11, B12, B13, B15, B18, B19	11	55
Total		20	100

Source: Authors

4. "What are the opinions of preschool children regarding the effect of the global problem on our planet?"

5. "What are the opinions of preschool children regarding the solution of the global problem on our planet?"

METHODOLOGY

Research design

The quality of educational experiences offered to preschool children is important for them to internalize the concept of sustainability. In this context, it is possible to increase the quality of education by reducing the faulty and unwanted by-products of education through collecting information contained in children's mental frameworks and offering children educational activities in line with the information gathered (Alan, 2015; Alici, 2013; Ayvaci et al., 2021; Cengizoğlu, 2013; Elliott and Davis, 2009; Gülay-Ogelman, 2012; Güler-Yıldız et al., 2017; Haktanır et al., 2012 as cited in Haktanır et al., 2016; Inoue et al., 2016; Kahrman-Öztürk et al., 2012; Prince, 2010; Siraj-Blatchford et al., 2010; Stuhmcke, 2012; Susan and Amy, 2013). Therefore, one of the strongest tools that can be employed to examine the thoughts and opinions of children formed as a result of educational experiences organized by teachers during the preschool education is metaphors created by children regarding a concept.

According to Nikitina and Furuoka (2008), a metaphor functions as a mental tool that mental images that represent people's perceptions of the real-world use to filter the reality. Lakoff (1992:1) stated the concept of metaphor used in contemporary metaphor research has changed over time, and it started to be used as "cross-domain mapping in the conceptual system". The term metaphorical expression means a linguistic expression formed as a result of surface realization of the domains in question (Lakoff, 1992). Thus, metaphors enable an image to be reflected on another image by gaining a stronger mental form as a result of expressing a phenomenon by comparing it to another phenomenon in an implicit or explicit manner (Ayvaci et al., 2021).

This research aiming to examine the metaphorical perceptions and views of preschool children regarding the concept of "global problem" is a qualitative research, and it employs phenomenological research design. Phenomenology follows an empirical approach aiming to describe the qualitatively different ways that people use in regard to phenomena that they experience, perceive, understand and conceptualize in their lives (Marton, 1986). Therefore, the phenomenological research design emerges as one of the important approaches used for the examination of the basic phenomena in education.

Study group

The participants of this research are 60-70-month-old, 20 preschool children, attending an independent public kindergarten supervised

by the Ministry of National Education in İzmir, Türkiye during the Spring Semester of 2021-2022 academic years. The study group was formed via convenient and criterion sampling methods. In convenient sampling, the researcher recruits the participants who are easy and accessible in order to speed up the research (Kılıç, 2013). In criterion sampling a situation or situations that meet a criterion that was set up by the researcher can be investigated (Yıldırım and Şimşek, 2008). In this research, convenient sampling method was employed to select the independent kindergarten, and the criterion sampling method was used to select the participants, the criterion being 60-70-month-old. Information regarding the participants' gender is summarized in Table 1 in terms of percentage and frequency.

When Table 1 is examined, it is seen that 45% (f=9) of the 60-70-month-old preschool children in the study group are girls, and 55% (f=11) are boys.

Data collection instrument and data collection procedure

The data of the research was collected via face-to-face interviews conducted with the participants. The data were collected through a demographic information form in which information regarding the age and the gender of children is obtained, and a semi-structured interview form including the metaphor sentence and open-ended interview questions developed by the researchers.

The phenomenological interviews employing a semi-structured interview form are traditionally designed as unstructured or semi-structured interviews. They are generally used to determine different concepts of a phenomenon by answering key questions of "what" and "how", to participate in a task or to solve a problem in order to reveal qualitatively different concepts of a phenomenon (Bruce, 1994). Therefore, the preschool participants answered the questions asked in the semi-structured interview form in order to provide data. In this context, literature regarding education for sustainable development in early childhood was examined in order to have information about the metaphorical perceptions and views of preschool children regarding the concept of global problem while the semi-structured interview form was being prepared (Alan, 2015; Buyer, 2013; Buyer, 2021; Årlemalm-Hagsér and Sandberg, 2011; Borg, 2019; Bulut, 2019; Davis, 2009; Elliot and Davis, 2009; Engdahl and Rabušicová, 2011; Kahrman-Öztürk et al., 2012; Paprotna, 1998; Siraj-Blatchford et al., 2010, Yazar, 2006). Based on the literature review, a semi-structured interview form that includes fill-in-the-blanks type of sentences as well as open-ended questions was developed.

The metaphor sentence and interview questions prepared to determine the metaphorical perceptions and views of preschool children about the concept of "global problem" on our planet are as follows:

The metaphor sentence is; "The global problem on our planet is like Because...".

Interview Questions:

a. What do you think the global problem on our planet might be?

- b. What could be the cause of the global problem on our planet?
- c. What do you think the effect of the global problem on our planet is?
- d. What can be done to solve the global problem on our planet?

The metaphor sentence and interview questions stated above were examined by 2 academicians and 2 teachers working in the field of preschool education, and were finalized after their feedback and corrections. After the revision of the form and questions, the data collection process continued as follows:

1. The data collection was carried out in the classrooms of the teachers who volunteered for the research. Detailed information was given to the participating teachers, and a consensus was reached to proceed effectively before the data collection process starts.
2. Since the study group consists of 20 children who are 60-70-month-old, their families were informed about the aim and scope of the research, and their permission was obtained for their children to participate in the study before the data collection process starts. Also, the researchers visited the participants in their classrooms and met with them before conducting the interviews.
3. Information was obtained regarding the preschool participants' educational experiences and activities organized by their teachers concerning "sustainability" and "global problems" during teacher interviews before the data collection process starts. In addition, information about children's prior knowledge was obtained by reading a story (Elliott and Newham, 2022) about the topic via interactive reading technique in the classroom. In light of the information obtained, it was decided that it would be appropriate to examine the metaphorical perceptions of children and to get their opinions regarding the concept of global problem.
4. During the interviews with the teachers, information was obtained regarding whether there were practices in students' previous educational experiences that enabled them to activate their metaphorical perceptions and to express themselves through metaphors. In this context, sample metaphor formation studies were carried out with children before the data collection process started. In this process, the question "What does it look like?" was asked for some concepts. It was exemplified by expressions "such as ..." and the children were also asked to respond using the word "such as".
5. The data of the study were obtained from 20 children individually in a comfortable environment via semi-structured interviews which took approximately 10-15 minutes for each child in May, 2022. During the data collection process, which lasted approximately 5 hours in total, the answers given by the children were recorded in writing by the researchers, and some questions were repeated and their answers were confirmed in order to prevent possible data loss.

Data analysis

Content analysis technique was used to analyze the data obtained from face-to-face interviews with 20 preschool children who are 60-70-month-old. According to Tavşancıl and Aslan (2001), content analysis is a scientific technique that involves the objective and systematic classification and analysis of the database obtained from verbal, written and other materials. Therefore, content analysis technique was employed to analyze the metaphors developed by the preschool participants and their answers given to the interview questions. Content analysis technique includes coding and sorting data, finding themes, organizing data under themes, assigning codes to the data, and interpretation of the findings (Yıldırım and Şimşek, 2008). In line with this information, in the process of generating themes in content analysis, the data obtained from the interviews were carefully read and codes were created according to the meanings that emerged in line with the purposes of the

research. For this purpose, the metaphors and answers given to the interview questions which were already in written form were coded. The coded data were analyzed and arranged due to their similarities and differences. Then, the codes that are related to each other were brought together to form themes and sub-themes. It was examined whether the codes and themes were determined effectively and logically. At this stage, the researchers coded each answer separately in order to determine under which themes and sub themes each answer could be placed. The relevant literature was also considered during the coding process, and each answer was coded separately by each researcher. In content analysis, it is recommended that the first data set be coded separately by two or more researchers and then reviewed together. It is stated that for coding adequacy, it is important that each encoder re-checks coding at a different time and goes through encoding reliability again (Miles and Huberman, 1994). These stages were followed in the coding process to generate the themes in the research.

Validity and reliability measures used in qualitative research were employed to ensure the validity and reliability of the research (Erlanson et al., 1993 cited by Yıldırım and Şimşek, 2008; LeCompte and Goetz, 1982; Miles and Huberman, 1994; Yıldırım and Şimşek, 2008). In the research, literature review was conducted during the question formation process to ensure the credibility of the interview form, and 2 researchers' and teachers' opinions, who were the subject matter experts, were asked. The interview form was rearranged in line with the experts' opinions. In addition, preliminary interviews were conducted with 4 children who are also 60-70-month-old and who attend an independent kindergarten in order to determine whether the questions in the form serve their purpose. After that, the form reached its final version.

In addition, the coding system was developed based on the insights gained from the in-depth interviews and the data was organized into meaningful themes that represent the observations. Furthermore, a comprehensive analysis was conducted on the themes to gain a deeper understanding of the phenomenon. Lastly, deeper analysis was conducted to confirm the findings. To ensure the trustworthiness of the study, the reliability between the codes of the two researchers was examined, and direct quotations were given. The reliability formula of Miles and Huberman (1994) was used during the reliability analysis of the data. The data were coded and the themes were given names by both of the researchers individually, and the reliability between their codes was calculated. For this purpose, Miles and Huberman's (1994) reliability formula for coding reliability is; $\text{Consensus/Consensus+Disagreement} \times 100$. This reliability should be close to 80% (Miles and Huberman, 1994). The reliability between the researchers' codes was found to be 92% for this research. In addition, direct quotations (statements) from the participants were presented. The position of the participants and the researchers are clearly defined, and the opinions expressed were confirmed by the participants, and the interview and analysis processes of the research were tried to be explained adequately in order to ensure the confirmability of the research.

FINDINGS

The findings of this research acquired via the data collected from the preschool children were explained in line with the sub problems in this part of the research. The preschool children's answers were examined in the context of the metaphor sentences regarding "the global problem on our planet"; what the global problem on our planet was, its causes, its effects and its solutions. In this context, the metaphors and opinions of preschool children were coded into themes (pillars) and sub-themes

and were depicted in terms of frequency and percentage which are forms of descriptive statistics.

Findings regarding the first sub problem of the study

The descriptive statistical findings regarding the question “*What are the metaphorical perceptions of preschool children regarding the concept of the global problem on our planet*”, the first sub problem of the research, are presented in Table 2.

As depicted in Table 2, the metaphors created by the preschool children regarding “global problem” make up three themes, three sub-themes and eighteen metaphors. In this context, it was determined that 12 children (60%) formed the metaphors of hunter, guard, shelters, plastic, rotten fruit, bomb, mine, plastic bag and funnel by establishing a relationship between global problems and the sub-theme of “harming nature” which was placed under the “social-cultural theme”. 5 children (25%) created the metaphors of disease, virus, tornado, glacier, fire and desert by establishing a relationship between global problems and the “disasters” sub-theme of “environmental” theme. 3 children (15%) formed the metaphors of money, space and lamp and they focused on the relationship between global problems and the “financial difficulties”, which was the sub-theme placed under the “economic” theme. It was determined that the metaphors created by children were included in the “harming nature” sub-theme of the “social-cultural” theme predominantly. The metaphors in the “financial difficulties” sub-theme of the “economic” theme were used the least.

B1, focusing on the relationship between the global problem and “harming nature” sub-theme of the “social-cultural” theme, expressed this similarity as “*The global problem on our planet is like 'hunters'. Because just like hunters, global problem kills the living things.*”. G2 also established a similar metaphor under the same theme and said “*The global problem on our planet is like 'guards'. Because like the guards, it harms living things.*”. Similarly, B6 and G8, who created the metaphors of mines and bombs, stated “*The global problem on our planet is like 'mines'. Because, like mines, it explodes in an instant and scatter flames*”, and “*The global problem on our planet is like a 'bomb'. Because it scares people away like a bomb.*”. G4 stated “*The global problem on our planet is like 'diseases'. Because, like diseases, it puts our health in danger*”. G5 and G16, who created similar metaphors under the same theme, expressed “*The global problem on our planet is like 'viruses'. Because it poisons us like viruses.*” and “*The global problem on our planet is like 'viruses'. Because it makes us sick like viruses.*”. While G14 who established a relationship between the global problem and the “disasters” sub-theme of the environmental theme expressed her opinion as “*Global problems on our planet are like 'tornadoes'. Because;*

they are big and messy like tornadoes.”. G15 who established another metaphor under the same theme stated “*Global problems on our planet are like 'glaciers'. Because; problems happen because they also get warm like glaciers.*”. Another participant, B13 created a relationship between the global problem and the “financial difficulties” sub-theme of the “economic” theme, and expressed this similarity as “*The global problem on our planet is like 'money'. Because money is needed for it too*”. Finally, B11, who established a similar metaphor on the same theme, reflected this similarity by saying “*The global problem on our planet is like 'space'. Because there is no food in space either*”.

Findings regarding the second sub problem of the study

The descriptive statistics regarding the question “*What are the opinions of preschool children regarding what the global problem on our planet might be?*” which was the second sub problem of the research are presented in Table 3

Findings shown in Table 3 depict that the opinions of preschool children regarding the question “what the global problem on our planet might be” can be placed under three themes, namely social-cultural, environmental and economic and three sub-themes namely “harming nature” under the “social-cultural” theme, “disasters” placed under the “environmental” theme, and “financial difficulties” placed under the “economic” theme. It was determined that 10 children (50%) expressed their opinions under the sub-theme of “harming nature”, 8 children (40%) expressed their opinions under the sub-theme of “disasters”, and 2 children (10%) expressed their opinions under the sub-theme of “financial difficulties”.

It was seen that B1 and G2, whose opinions fell under the “harming nature” sub-theme under the social-cultural theme, expressed similar opinions and said “*I think global problem is the killings of animals.*” and “*I think global problem is that animals are mistreated.*”. Also, G8 stated “*It is that some children become homeless.*”. It is seen that 5 children whose ideas fell under the “harming nature” category stated “*I think global problem is that there is too much garbage on our planet.*” Which appears to be the most frequently used expression for a single problem. Therefore, it is possible to conclude that children mostly pay attention to the garbage problem in nature which was placed under the sub-theme of “harming nature”. On the other hand, it is seen that children who express that the global problem fell under the disasters sub-theme which was placed under environmental theme, focus on fires in nature, air pollution, water scarcity, experiencing all four seasons at the same time, global warming, and harmful fuels. Finally, B11 and B13, whose response regarding the global

Table 2. The metaphorical perceptions of pre-school children regarding the concept of the global problem on our planet.

Themes (Pillars)	Sub-themes	Metaphor	Codes (Because)	Participants	Frequency (f)	Percentage
Social-cultural	Harming nature	Hunter	Harms people like hunters	B1	12	60
		Guard	It harms living things like guards.	G2		
		Shelters	Like in shelters, they do not treat dogs well.	B12		
		Plastic	It emits poison like plastics.	G3		
		Rotten fruit	It smells very bad, like rotten fruit.	B7		
		Plastic Bag	It is harmful and plastic like plastic bags.	B9		
		Funnel	It is huge and plastic like funnels.	G20		
		Mine	It explodes like mines and scatter flames.	B6		
		Bomb	It scares people away like bombs.	G8		
		Disease	Like diseases, it puts our health in danger.	G4		
		Virus	It poisons us like viruses.; It makes us sick like viruses.	G5, G16		
Environmental	Disasters	Tornado	It creates big mess like tornadoes.	G14, B19	5	25
		Glacier	It gets warm like glaciers.	B15		
		Fire	It causes damage like fires.	B10		
		Desert	It is like being dehydrated as in deserts.	G17		

Source: Authors

problem was placed in the sub-theme of financial difficulties under the economic theme, said that *“I think global problem is that some children cannot find food.”* and *“I think global problem is that everything is very expensive.”*

Findings regarding the third sub problem of the study

The descriptive statistics regarding the question *“What are the opinions of preschool children regarding the cause of the global problem on our planet?”* which was the third sub problem of the research, are presented in Table 4.

As depicted in Table 4, the opinions of

preschool children regarding the cause of the global problem on our planet are placed under three sub themes and three themes namely “situations that harm nature” under the “social-cultural” theme, “causes of disasters” under the “environmental” theme, and the “causes of financial difficulties” under the “economic” theme. All in all, 12 children (60%) expressed their opinions under the sub-theme of situations that harm nature, 6 of them (30%) under the sub-theme of the causes of disasters, and 2 children (10%) under the sub-theme of the causes of financial difficulties. Therefore, it was determined that preschool children thought the causes of global problems fell under the sub-theme of “situations that harm nature” which was placed

under the social-cultural theme most frequently, and the causes of global problems fell under the sub-theme of causes of financial difficulties under the economic theme with the lowest frequency. B1, whose opinion was placed under the sub-theme of the situations that harm nature placed under the social-cultural theme, expressed the cause of the global problem as *“Because people want to buy more clothes”*. It was determined that 5 children who expressed their opinions on the same theme explained it by focusing on the garbage problem in nature. G8 whose opinion fell under the same theme, pointing out wars, stated *“Because there is a lot of wars going on in the world. Thus, children are forced to move away from their homes. For example, my Syrian friend*

Table 3. Opinions of children in pre-school education regarding the concept of "global problem".

Themes (pillars)	Sub-themes	Codes (problem)	Participants	Frequency (f)	Percentage
Social-cultural	Harming nature	It is the killing of animals	B1	10	50
		It is the mistreatment of animals	G2		
		It is that dogs mistreat us	B12		
		It is that plastic garbage kills animals	B9		
		It is that some children become homeless	G8		
		It is that there is too much garbage on our planet	G3, G4, G5, B7, G20		
Environmental	Disasters	It is the increase of fires in nature.	B6, B10	8	40
		It is that cold and polluted air makes our lives more difficult	G14		
		It is the occurrence of all four seasons all at once	B15		
		It is the harmful fuels	G16, B19		
		It is the absence of water in some places	G17		
		It is the global warming	B18		
Economical	Financial difficulties	It is that some children cannot find food	B11	2	10
		It is that everything is very expensive	B13		

Source: Authors

was like that, but now they have a house. They live in the building opposite us.”. In addition, while B6 whose opinion fell under causes of disasters sub-theme under the environmental theme said regarding the cause of the global problem that “Because necessary precautions are not taken about fires.” B10 and B15, whose opinions also fell under the environmental theme, gave global warming as the cause of the problems, which is the most frequently used theme for a single reason. Lastly, B13, whose opinion was placed under the sub-theme of causes of financial difficulties which took place under the economic theme stated that the global problem is that the price of everything is very high and expressed the cause of the global problem as “Because the price of everything increases a lot.”.

Findings regarding the fourth sub problem of the study

The findings regarding the question “What are the opinions of preschool children regarding the effect of the global problem on our planet?” which was the fourth sub problem of the research, are presented in Table 5

Table 5 shows that the opinions of preschool children regarding the effect of the global problem on our planet were gathered under three sub themes and three themes: consequences of situations that harm nature which was placed under social-cultural theme, consequences of disasters under the environmental theme, and consequences of financial difficulties placed under the economic theme. In this context, 13 children

(65%) expressed their opinions under the sub-theme of the consequences of situations that harm nature, 5 children (25%) expressed their opinions under the sub-theme of the consequences of disasters, and 2 children (10%) expressed their opinions under the sub-theme of consequences of financial difficulties. Therefore, it is seen that preschool children’s opinions regarding the effects of global problems are most frequently expressed under the sub-theme of consequences of situations that harm nature which fell under social-cultural theme. When sentences which were placed under the sub-theme of consequences of situations that harm nature were examined in terms of the frequency of opinions, the expressions regarding the occurrence of diseases, disruption of the natural

Table 4. Opinions of pre-school children regarding the cause of the "global problem".

Themes (pillars)	Sub-themes	Codes (cause)	Participants	Frequency (f)	(%)
Social-cultural	Situations that harm nature	That people want to buy more clothes.	B1	12	60
		Having wars.	G8		
		That people want more than they need	G16		
		That people think about their own well-being.	B19		
		Building houses on the places where animals live.	G2		
		That dogs cannot find food in nature	B12		
		That plastic wastes kill animals.	B9		
		Excessive use of plastics and not separating them as recyclables.	G3		
		That there are not enough trash cans.	G4		
		That people do not know that throwing garbage into nature is harmful.	G5		
		That people throw garbage on the ground.	B7		
		That people throw garbage into nature.	G20		
Environmental	Causes of disasters	Failure to take necessary precautions for disasters	B6	6	30
		Global warming	B10, B15		
		That things like oil and natural gas pollute our air	G14		
		Too much water consumption	G17		
		The problem of unnecessary consumption of natural resources	B18		
Economic	Causes of financial difficulties	That people do not help each other	B11	2	10
		That the price of everything increases very much	B13		

Source: Authors

balance, being foreigners and being homeless, having no planet to live and having no place to live and animal aggression were found. Findings under the sub-theme of consequences of disasters are expressed as global warming, increase in fires, water scarcity and pollution. The findings placed under the sub-theme of consequences of financial difficulties under the economic theme were expressed as hunger and poverty, and they had the lowest frequency.

While B1, whose opinion fell under the sub-theme of consequences of situations that harm

nature which was under the social-cultural theme, expressed the effects of the global problem on our planet as *"We begin to be unable to breathe on our planet. Because if animals die, the balance is disturbed."* G3 and G4 stated that *"If garbage continues to be too much like this, people may not have a place to live"*, *"If there is a lot of garbage, people will be infected by viruses and get sick."* Also, G8, who expressed her opinion which was also placed under the sub-theme of consequences of situations that harm nature which was under the social-cultural theme stated *"We can't play any*

games with my refugee friend. Even though he goes to school, he doesn't understand us anything because he's a foreigner". On the other hand, it is seen that B6, who gave his opinion under the sub-theme of the consequences of disasters under the environmental theme, stated *"The source of life for humans is oxygen. Without trees and flowers, our oxygen will decrease, and there will be global warming."* Similarly, G16 stated *"There will be global warming and we will not have a place to live."* Finally, B13, whose opinion regarding the effect of the global problem was placed under the

Table 5. Opinions of pre-school children regarding the effect of "global problem".

Themes (pillars)	Sub-themes	Codes (cause)	Participants	Frequency (f)	Percentage
Social-cultural	Consequences of situations that harm nature	If animals die, the balance is disturbed.	B1, B9	13	65
		Animals start chasing us to protect themselves	G2		
		If the animals have no place to live the balance will be disturbed	B15, G14		
		Living things get sick	G4, G20		
		Children who migrate in wars feel alienated	G8		
		Children cannot play in the park	B12		
		The world becomes a place filled with garbage	G5		
If the Earth becomes uninhabitable, another planet is searched	B7 G3, B19				
Environmental	Consequences of disasters	Global warming happens	B6, G16	5	25
		Our world gets polluted	B10		
		We can run out of water	G17		
		Animals die, fires begin	B6, G16		
Economical	Consequences of financial difficulties	Children starve, die	B11	2	10
		People become poor, we run out of money	B13		

Source: Authors

sub-theme of the consequences of financial difficulties under the economic theme said *"People are getting poorer and we're running out of money."*

Findings regarding the fifth sub problem of the study

The descriptive statistical information regarding the question "What are the opinions of preschool children on the solution of the global problem on our planet?", the fifth sub problem of the research, is presented in Table 6.

As Table 6 shows, distribution of the opinions of preschool children regarding the solution to the global problem in terms of 7R sub-themes

developed for education for sustainable development took place under the sub-themes of respect, rethink and reflect under the social-cultural theme as well as under the sub-themes of reduction and reuse under the environmental theme and under the sub-themes of recycle and redistribute under the economic theme. In this context, it has been determined that the frequency of the opinions of preschool children regarding the solution of global problem is expressed like this: 9 children's (45%) opinions fell under the social-cultural theme, 6 children's (30%) opinions fell under the economic theme, and 5 children's (25%) opinions fell under the environmental theme. In addition, it was found that the most emphasized sub-theme of the social-cultural theme was rethink (f=6), and the most emphasized

sub-theme of the economical theme was recycle (f=4) and the most emphasized sub-theme of the environmental theme was reduce (f=4). G2, who expressed her opinion regarding the solution of the global problem under the sub-theme of respect which took place under the social-cultural theme stated *"People should accept animals' right to live and respect them."* Also, B1 who gave his opinion under the sub-theme of rethink stated *"We can produce our clothes with other materials."* Also, emphasizing the need for new tools as solutions to the global problem B6 and B9 stated *"We can create a combination of soil, clay, mud and water to extinguish the fires."* and *"We can use pincer-shaped tools to clean our environment because germs can make us sick if we use our hands."*

Table 6. Opinions of pre-school children regarding the solution of "global problem".

Themes (pillars)	Sub-themes (7R's)	Codes (solution)	Participants	Frequency (f)	Percent	
Social-cultural	Respect	People should accept animals' right to live and respect them	G2	9	45	
		Animals should be helped	B12			
	Rethink	Adults and children should be more aware and be informed	B10, G14, B10			
		Our clothes must be produced with other materials	B1			
Environmental	Reduce	New tools should be designed to protect our environment	B6, B9			
		People should buy only what they need	G15,	5	25	
		People should turn off running water and light when unnecessary	G17, B18,			
Instead of cars minibuses should be used	B19					
Economic	Reuse	People should not throw away materials immediately but reuse them	B7			
		Recycle	Garbage should be thrown into recycling bins and should be recycled	G3, G4, G5, G20	6	30
			Redistribute	People should help each other more.		

Source: Authors

Also, G8 who expresses her opinions under the sub-theme of reflect said *"If all wars end children fleeing wars can return to their homes."*

G17 who expressed her opinion under the reduction sub-theme of the environmental theme regarding the solution of global problems stated *"We have to turn on the tap water less now. For example, while brushing teeth or washing our hands, we should turn off the tap and inform our elders."* B18 also expressed his opinion under the same theme and said *"For example, we must turn off the light when leaving a room. We should close taps tightly when we are not using them."* On the other hand, B7, who expressed his opinion on the reuse sub theme under the environmental theme, said *"I think people should start using materials differently, like me. For example, I know how to make ships and airplanes out of used paper."* Lastly, G3, who expressed her opinion under the sub theme of recycle under the economic theme

regarding the solution of global problem, stated *"People should recycle their trash by throwing it in the recycling bins."* It is found that B11 who gave his opinion under the redistribute sub-theme stated *"Everyone should treat each other better and help each other."*

DISCUSSION

Adopting a holistic view of sustainability with its environmental, social and economic pillars (Giddings et al., 2002) forms the pluralistic and transformative view and analytical framework for education for sustainability (Ohlsson et al., 2022). Education for sustainability, which is strongly emphasized to be integrated into the preschool period, should ensure that children, also being citizens of the world, be aware of the serious environmental problems that the world

experiences today, and should prepare children to find solutions to economic and social problems (Eriksen, 2013; Grindheim et al., 2019; Pramling-Samuelsson, 2011). In this study, the opinions of preschool children on the concept of global problem were presented and interpreted from this point of view.

Many issues and concepts related to sustainability were thought to be far beyond the cognitive comprehension of children during the 2-7year old period, which was called the preoperational period by Piaget, and the necessity of including these issues in their education were not considered until recently (Berndt, 1997 cited by Elliot and Davis, 2009). However, when the relevant literature was examined, it is emphasized that children between the ages of 4-6 can think very consciously and sensitively about many issues such as global warming, waste management and deforestation within carefully

prepared educational experiences (Alan, 2015; Buyer, 2013; Ayvaci et al., 2021; Cengizoğlu, 2013; Fretes et al., 2021; Green, 2019; Gülay-Ogelman, 2012; Haktanır et al., 2012 cited by Haktanır et al., 2016; Kahriman-Öztürk et al., 2012; Palmer et al., 2003; Palmer, 1999; Palmer, 1995; Paprotna, 1998; Prince, 2010). The findings of Palmer (1999), whose research project was about environmental emergencies and was carried out in 16 countries, support this view. His findings demonstrated that children in the 4-6 age groups can think about environmental problems in a more complex manner than many adults do (Alici, 2013). Moreover, it was determined that permanent changes were observed in the behaviors of children who were involved in environmental and sustainability education practices during the preschool education period (Cevher-Kalburan, 2009). Therefore, it is suggested that education for sustainability and environment should start from early childhood years in order to raise children who are able to look for the problem, find it, and find a solution to it as the creators of sustainable future today (Ahi and Alisinanoğlu, 2016; Elliot and Davis, 2009; Miller et al., 2014; Ohlsson et al., 2022). In this respect, it is thought to be important to learn about current perceptions and views of children, who are considered to be an integral part of sustainable development, regarding "global problems". In this context, the results obtained from this research regarding the metaphorical perceptions and views of 60-70 month old preschool children about "global problems" are tried to be discussed in this part of the research.

Metaphors regarding "global problem" obtained from preschool children through their metaphor sentences consisted of sub-themes of "harming nature" under social-cultural theme, "disasters" under environmental theme and "financial difficulties" under economic theme. Also, it has been determined that metaphors are most frequently produced under the sub-theme of harming nature of the social-cultural theme. In line with this, Prambling-Samuelsson (2011) expressed that today's children, living in a rapidly changing society within the dynamism of the 21st century, can observe, notice, learn and experience poverty, climate change, natural disasters as well as many complex problems among individuals and nations (Borg, 2019). In this context, in a study aiming to reveal the knowledge levels of 4 and 5 years old children attending preschool education regarding the concepts of forests and deforestation, it has been determined that many children stated that the destruction of forests had negative effects on animals, one child stated that this situation would adversely affect the atmosphere, and another child stated that this situation would cause landslides (Ahi and Balci, 2017).

Therefore, it is thought that children can establish and conclude a relationship between global problems and harming nature through their strong observation skills and environmental perspective. In this research, global problems were examined in general and it was seen that

children stated metaphors for environmental problems more intensely.

Based on the results obtained from the this research, the use of the metaphors only for environmental problems by children can be examined in more detail in other studies, and they can be interpreted in terms of the pillars of education for sustainable development. In addition, it is expected that this research will contribute to other studies and related literature in which children's perceptions of environmental problems and the underlying meanings of their metaphors are examined.

Findings regarding the global problem obtained through interview questions from preschool children, consisted of sub-themes of "harming nature" under social-cultural theme, "disasters" sub theme under environmental theme and "financial difficulties" sub theme under economic theme. Also, it was determined that opinions were mostly expressed under harming nature sub-theme of the social-cultural theme. In this context, the opinions of preschool children regarding the global problem seem to emphasize harming animals and the presence of a lot of garbage on our planet under the sub-theme of harming nature. Similarly, Caiman et al. (2022) conducted a study to investigate about characteristics of early childhood education for sustainable development by paying specific attention to the features that take place in their creativity processes synchronously. In their research, it was determined that although children focused on sustainable consumption they discovered sustainable consumption related to the safety of animals in the process. In the light of the findings of the research, it was concluded that these ideas about sustainable consumption resonate with the interpersonal learning discussions (Jickling and Blenkinsop, 2020) and be related to Van and Vandenebeele's (2012) idea of "participatory learning". On the other hand, it was determined that the participants of this research focused on the increase in fires in nature, people's use of harmful fuels, global warming, seasonal changes and water scarcity under the sub-theme of disasters. Parallel to this, other studies in the relevant literature reveal that children between the ages of 2-6 are capable of understanding the concepts of waste, garbage, recyclables and non-recyclables, as well as environmental issues and problems such as global warming, waste management and deforestation (Ahi and Balci, 2017; Palmer et al., 1999; Palmer, 1999). Finally, under the sub-theme of financial difficulties, the statements "some children cannot find food" and "everything is very expensive" are important. Thus, when the fact that most of the mental frameworks of children are formed during early childhood years by social learning, and that their behavioral patterns are formed by modeling/reflection are taken into consideration, it is thought that reflecting events in social-cultural and socio-economic life to children intentionally or unintentionally affects their perceptions, views and behaviors significantly.

Parallel to this, in Borg's (2017a) study which aims to examine the knowledge levels, knowledge sources and behavioral patterns of children during preschool education regarding the use of money, it was concluded that children tend to share with a sense of social responsibility and moral obligation acquired from their parents and teachers. Again, in Borg's (2017b) study, children studying at eco-certified kindergartens, comparing to children attending other schools, are more aware of the fact that children living in different parts of the world do not have the similar economic status with them, and it was concluded that they reached this awareness through their parents, different media and their personal experiences. Similarly, Grodzińska-Jurczak et al. (2006) state that some environmental patterns of children are a reflection of those of their parents. Musser and Diamond (1999) also stated that siblings, grandparents, teachers, visual or written media and materials such as television and books are as effective as children's parents on these patterns. The current research conducted in this direction (Borg, 2019; Li et al., 2019; Singer-Brodowski et al., 2019) also emphasizes that a comprehensive sustainability approach can only achieve success through the collaboration of family, school, and community partners. When the findings of this research are considered, it can be concluded that 60-70 month old children who participated in this study have a certain level of knowledge and awareness regarding various global problems. These results obtained from the research generally express the views of children on global problems. Based on the views of children, this research is expected to shed light on future research in which each of the problems experienced in the socio-cultural, environmental and economic pillars of sustainability will be examined separately. In addition, it is thought that it will be important in terms of education for sustainable development to ensuring make other studies examining the ways in which children acquire this knowledge about global problems.

Findings regarding the reason of the global problem, obtained through interview questions from preschool children, consisted of sub-themes of situations that harm nature under social-cultural theme, causes of disasters under environmental theme and causes of financial difficulties under economic theme. It is determined that the opinions of the participating children regarding the reason of global problem fell mostly under the sub-theme of the situations that harm nature under the social-cultural theme. Considering the codes under the themes and sub-themes, the opinions of 60-70 month-old children regarding the cause of global problems mostly appear to have been caused by human actions.

Similarly, Ayvaci et al. (2021) state 58-60 month old children point out human actions as the source of the environmental problems. Šoryté and Pakalniškienė (2019) also investigate the reasons of 6-11 years old children to protect the environment and conclude that

children are aware of some environmental problems and actions that produce garbage and harm the environment. The participants of our research, regarding the cause of the global problem, focused mostly on global warming under sources of disasters theme and people's not helping each other and the increase in the prices of everything under sources of financial difficulties. There is also similar research findings conducted with preschool children (Barrett and Short, 1992; Borg, 2017b; Palmer and Suggate, 2004; Palmer et al., 1999). In this respect, findings of this research are parallel to the findings of similar research conducted with preschool children in terms of the reason of global problem. This research was carried out with the participation of children from Türkiye. It is expected that these findings will contribute to other researches that will examine children's views on the causes of global problems comparatively in different countries, and that the results of these researches will contribute to the literature for education for sustainable development.

The findings of this research regarding the effects of the global problem, obtained through interview questions from preschool children, consisted of the sub theme of consequences of situations that harm nature under social-cultural theme, the sub theme of consequences of disasters under environmental theme and the sub theme of consequences of financial difficulties under economic theme. In addition, it was seen that the participants' opinions mostly fell under consequences of situations that harm nature sub theme. It was found that children who voiced their opinions about consequences of situations that harm nature and consequences of disasters focused on homelessness, having no place to live (having no planet to live), harming the living things and global warming. In addition, children who voiced their opinions under the consequences of financial difficulties sub theme focused on poverty and inequality. Basing on the findings, it can be said that preschool participants have a certain level of knowledge regarding several global problems, and they are capable of observing the consequences of these problems. Pramling-Samuelsson (2011) indicates preschool children know about problems related with global warming and poverty (Brog, 2109). Parallel to this, Palmer and Suggate (2004) investigated about the opinions of 4-10 year old children in England regarding their factual knowledge on rain forests and poles (global warming), which are very far away regions, and also investigated about their opinions regarding the causes and the effects of environmental changes in these regions. Their findings concluded that children who are younger than 4 years of age are capable of giving simple and correct statements about the effects of big environmental changes on living things and habitats. Therefore, it is possible to say children need more opportunities than ever to express their voices about sustainability (Bautista et al., 2018; Borg and Pramling-Samuelsson, 2022). In this respect, it is emphasized that

education for sustainable development, which embodies a potential for supporting social environmental solidarity basing on interdependency and critical thinking and offers a potential for an individual to respect himself/herself, others and the environment, should be integrated into every level of formal education (Davis et al., 2009; Ohlsson et al., 2022). This way, it is envisioned that children can become active decision-makers of the sustainability process by turning to purposeful actions related to issues affecting their own lives (Mackey, 2012 as cited in Borg, 2019). According to the results obtained from this research, it is thought that children can make inferences about the effects of global problems. It is expected that the results of this research will contribute to new researches that include the preparation and implementation of education programs for sustainable development, which will support children's awareness of the effects of global problems and make inferences about these problems.

The findings of this research regarding the solution of the global problem, obtained through interview questions from preschool children, are stated in terms of social-cultural, environmental and economic themes, the three pillars of sustainable development. The participant children's opinions were investigated in terms of 7R's which were developed to define education for sustainable development for early childhood. The findings of this research indicated that solutions to global problems offered by the preschool children fell under respect, rethink and reflect sub themes of the social-cultural pillar. Hedefalk et al. (2014) analyzed the research published during 1996-2013 regarding early childhood education for sustainable development in terms of sub themes. Their findings indicated that research conducted between these years evolved into research on education for children that views them as active agents of change for environment and sustainability rather than teaching real dimensions of environment and sustainability. It is thought that one of the goals of Education for Sustainable Development, creating proficient children who are able to think by themselves and give well-informed decisions, can only be created through this new approach. These decisions given after making critical discussions and conducting research regarding alternative ways to make changes are viewed very critical for today's world. In this respect, the findings of Borg's (2019) research on preschool children which state preschool children are able to voice their opinions by combining them with one or more related opinions is parallel to the findings of this research. The participants of this study are 60-70 months old preschool children. The results of this research are expected to make meaningful contributions to future research in which the perspectives of the younger preschool children on global problems are developed and evaluated according to the 7R. The results of this research are expected to make meaningful contributions to future researches in which children's perspectives on global

problems are developed and evaluated according to the 7Rs.

In terms of the social-cultural theme, Grodzińska-Jurczak et al. (2006) research state that children generally tend to emphasize the value of nature, respect the living things and maintain clean environment around them. Šorytė and Pakalniškienė's (2019) research indicate that children's opinions regarding the protection of environment is related to human beings and other elements of the nature and also children give statements about the importance of protecting human life, human health, animals and plants. In addition, research on early childhood education today indicates that children, parents and teachers do not focus only on local problems but they also focus on global problems such as making compost, reduction, reuse and recycling (Alici, 2013; Årlemalm-Hagsér and Sundberg, 2016; Cengizoğlu, 2013; Güler-Yıldız et al., 2017; Häikiö et al., 2020).

When the findings of this research is generally considered, it was found that 60-70 month old preschool participants of this study have a certain level of knowledge and awareness about global problems regarding the social-cultural, environmental and economic pillars of education for sustainable development. It was found that preschool children's metaphors and their opinions regarding what the global problem might be, its' reasons, effects and solutions were mostly fell under the social-cultural theme. In addition, although it was also found those preschool children's metaphors and opinions regarding the concept of global problem and its reasons, effects and solutions most frequently fell under social-cultural theme it was also found that the children mostly voiced opinions about nature under the sub theme of the social-cultural theme. It was determined that the preschool children gave opinions about "questioning" placed under the social-cultural theme, "recycling" placed under the economic theme and "reduction" placed under the environmental theme as the solution of the global problem for sustainable development most frequently.

It is also thought that children are a part of the global problems and it is important that children's knowledge should transform into behaviors after combining their knowledge with their environmental, social-cultural and economic awareness, sensitivity and consciousness. The six modular steps of goals regarding present global problems and solutions (1) Education and skills, gender and inequality (2) good health, well-being and demographics (3) separation of carbon from energy, clean energy and sustainable industry (4) sustainable food, soil, water and oceans (5) sustainable use of land; cities and communities and (6) digital transformation for sustainable development (Sachs et al., 2021; Sachs et al., 2019). Therefore, when current global problems are viewed from the viewpoint of education for sustainable development, both the future goals for the world and the results of this research suggest that it is necessary to present educational experiences that support sustainable

development during preschool years. It is thought that educational experiences that support sustainable development contribute children's self-recognition and self-realization to a great extent and also has a critical role for the sustainable future of the world they live in.

SUGGESTIONS

Basing on the results of this study, the following suggestions are extended in order to shed light to the future research:

- 1) The relationship between preschool teachers' and prospective teachers' opinions and their metaphorical perceptions regarding global problems and their environmental, social-cultural and economic behaviors can be investigated.
- 2) Educational activities about sustainability prepared by preschool teachers in order to make the concept more concrete for students and to be internalized by them can be investigated in terms of quality and quantity. In addition, the number of these educational activities can be increased.
- 3) The effects of educational activities regarding sustainable development on children's thinking skills, resilience, cognitive flexibility and viewpoints of nature can be investigated.
- 4) Experimental studies about environmental, social and economic pillars of sustainability for preschool education can be prepared and their developmental consequences in terms of sustainability can be investigated.
- 5) Preschool teachers' planning, implication and evaluation processes of sustainability activities and difficulties they encounter during this process can be investigated.
- 6) Children can be provided more information by conducting studies of sustainability in collaboration with administrators, teachers, students and families in educational institutions offering preschool education.
- 7) Teachers' professional development can be supported and their self-efficacy can be improved by organizing E-Twinning activities regarding education for sustainable development at the national and international levels, and consequently preschool children can increase their knowledge, skills and behaviors regarding sustainability.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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Full Length Research Paper

Relationship between Chinese college students' perceived transformational leadership by physical education teachers and their exercise adherence: The mediating role of physical self-efficacy

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The interruption of regular physical exercise among Chinese college students is a key cause of the lack of motivation to exercise. Therefore, on the basis of self-efficacy theory, this study analysed the interrelationships between the perception of transformational leadership in physical education (PE) by teachers, physical self-efficacy, and exercise adherence among Chinese college students. A questionnaire survey was conducted using a convenience sample of 448 students from five universities in Hebei Province, China. They perceived transformational leadership by PE teachers to significantly positively influence exercise adherence. In addition, physical self-efficacy partially mediated the relationship between college students' perceptions of transformational leadership by PE teachers and exercise adherence. These findings suggest that university administrators could encourage PE teachers to make greater use of transformational leadership and improve education and guidance regarding physical self-efficacy for college students to promote exercise adherence.

Key words: Transformational leadership, physical self-efficacy, exercise adherence, college students.

INTRODUCTION

The literature indicates that Chinese college students experience substantial academic and employment pressure (Liu et al., 2019; Shao et al., 2020). Motivating college students to maintain long-term regular physical activity in order to promote healthy physical and mental development is a complex and practical problem faced by researchers (Abula et al., 2018; Cairney et al., 2019).

Exercise adherence is a behavioural tendency of individuals to exhibit persistence or effort during physical exercise (Dishman, 1994). Some studies have demonstrated that when they no longer have mandatory physical education (PE) courses, most students drop out of PE because they do not form conscious exercise habits and because the effects of PE courses are not

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sustained, which causes a rapid decline in the physical fitness of university students (Yu et al., 2022; Bielec and Omelan, 2022). Therefore, how to improve physical activity adherence among students at university level was the focus of this study.

Transformational leadership by teachers refers to when teachers stimulate awareness of students' higher-level needs or help students to develop their needs and aspirations by making them aware of their responsibility and the importance of the task they are undertaking and by helping them to reach achievements beyond their expectations (Beauchamp et al., 2010). Research regarding teacher leadership and its outcome variables has received attention from researchers in the field of physical exercise. For example, Bum (2018) demonstrated that sport coaches empowered individual exercise participants to manage their willpower, thoughts, and behaviours and that sport coach leadership was critical to adherence to exercise. In a survey of tennis club members, Yoo and Hwang (2017) identified that the leadership behaviours of sports coaches positively affected tennis club members' willingness to persist in the sport, implying that the leadership behaviours of sports coaches ultimately led to club members' continued participation in the sport.

Leadership in exercise groups significantly positively affects member exercise adherence (Wang et al., 2014). Transformational leadership by PE teachers influences individual behavioural outcomes (Morton et al., 2010; Price and Weiss, 2013).

Although few studies have directly demonstrated a relationship between transformational teacher leadership and exercise adherence, indirect evidence, such as that from the aforementioned studies, supports this relationship. Therefore, the present study hypothesized that college students' perceptions of transformational leadership by PE teachers may positively influence their exercise adherence.

Self-efficacy theory supports leadership models (Chelladurai, 2007). Self-efficacy theory involves subjective assessment of an individual's ability to complete an aspect of an activity, and this assessed ability directly influences the individual's behaviour (Bandura, 1986). Physical self-efficacy is often used in relation to physical exercise to examine an individual's level of confidence in a sport. Sun et al. (2005) argued that physical self-efficacy is the level of belief an individual holds in their physical ability to accomplish their goals in a sport. Education research has demonstrated that transformational leadership is a valuable tool with which teachers can enhance student self-efficacy in learning (Slavich and Zimbardo, 2012) and that transformational leadership by teachers significantly predicts students' self-efficacy in learning (Yüner, 2020). Thus, in the context of physical activity, college students' perceptions of transformational leadership by PE teachers may positively influence their physical self-

efficacy.

Self-efficacy significantly affects individual behaviour by helping to optimise cognitive processes, determining the selectivity and persistence of behaviours, and influencing the acquisition of new behaviours and the performance of acquired behaviours (Bandura and Watts, 1996). In addition, self-efficacy is closely related to physical exercise behaviour (McAuley and Blissmer, 2000). Collins et al. (2004) suggested that individuals with higher self-efficacy in physical exercise have higher adherence to physical exercise programs. In previous studies, self-efficacy has often served as a mediator that reflects the effects of external environmental stimuli on an individual's internal psychology and behaviour (Theodoropoulou et al., 2017; Darr et al., 2018; Xu and Qi, 2019). Similar findings exist in the field of physical exercise. An empirical study by Wu and Pender (2002) demonstrated that self-efficacy was the most critical predictor of physical activity and that interpersonal influences indirectly affected physical activity, with self-efficacy mediating this process, suggesting that self-efficacy is a key mediating variable. Similarly, the present study hypothesized that physical self-efficacy is a crucial mediator of the effect of college students' perceptions of transformational leadership by PE teachers on their exercise adherence. Therefore, in this study, physical self-efficacy was empirically investigated as a mediating variable to examine the relationship between perceived transformational leadership and exercise adherence among college students.

The leadership of university PE teachers, which has rarely been addressed in research on the antecedent mechanisms affecting physical exercise adherence, is crucial in the development of physical exercise habits among college students (Kocaeksi et al., 2015; Jiang and Jia, 2018). Therefore, this study used self-efficacy theory to explore the mechanisms by which college students' perceptions of transformational leadership by PE teachers affect exercise adherence, as well as the mediating role of physical self-efficacy in this relationship. Thus, this study proposed the following hypotheses:

- (1) College students' perceptions of transformational leadership by PE teachers positively influences exercise adherence.
- (2) College students' perceptions of transformational leadership by PE teachers positively influence physical self-efficacy.
- (3) Physical self-efficacy mediates the relationship between college students' perceptions of transformational leadership by PE teachers and their exercise adherence.

MATERIALS AND METHODS

Research framework

This study used college students' perceptions of transformational

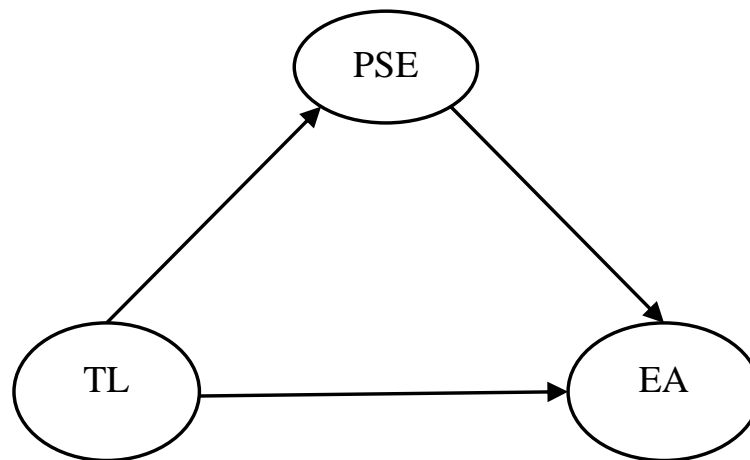


Figure 1. Research framework. TL, Transformational Leadership; EA, Exercise Adherence; PSE, Physical Self-Efficacy.

Source: Authors

leadership by PE teachers as an independent variable, exercise adherence as a dependent variable, and physical self-efficacy as a mediating variable. On the basis of the aforementioned research hypotheses, the research structure shown in Figure 1 was proposed.

Research participants

This study was conducted from Nov. to Dec., 2022. College students from 5 universities in Hebei Province, China, constituted the study population. A convenience sampling method was used to select 100 college students from each university, with a total of 500 college students completing the questionnaire. The questionnaire was distributed at the end of the university's PE course with the consent of the course instructor, and the researcher informed the participants of the purpose of the study, the procedures for survey participation, and the confidentiality agreement (the questionnaire was submitted anonymously, and the data were processed anonymously for this study only); if the participants had any concerns, they could refuse to participate or withdraw from the study at any time. The questionnaire was distributed using an online questionnaire application (www.wjx.cn) after the participants had provided informed consent. The participants completed the online questionnaire by scanning a QR code with their mobile phones. A total of 487 questionnaires (97.4%) were returned. After exclusion of invalid questionnaires, 448 valid questionnaires remained (yielding a valid return rate of 89.6%), of which 186 (41.5%) were completed by men and 262 (58.5%) were completed by women.

Research tools

Transformational teaching questionnaire

This study used the Transformational Teaching Questionnaire developed by Beauchamp et al. (2010), a 16-item scale consisting of 4 dimensions: idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration. The scale consists of statements such as 'My PE teacher trusts me'. A 5-point Likert scale was used, with the following options numbered 1 to 5: strongly disagree, disagree, generally agree, agree, and strongly

agree. A higher score indicated a higher level of agreement. In this study, the Cronbach's α score were 0.716 for idealized influence, 0.866 for inspirational motivation, 0.904 for intellectual stimulation, and 0.897 for individualized consideration. The Cronbach's α for the overall scale was 0.940.

Exercise adherence scale

This study used the Exercise Adherence Scale developed by Wang et al. (2016), with 14 items across 3 dimensions, namely behavioural habits, studiousness, and emotional experience. This scale consists of statements such as 'I am determined to stick to physical activity'. The responses were scored on a 5-point Likert scale with the options strongly disagree, disagree, generally agree, agree, and strongly agree numbered 1 to 5. A higher score indicated a higher level of adherence to physical exercise. In this study, the Cronbach's α score were 0.708 for behavioural habits, 0.876 for studiousness, 0.860 for emotional experience, and 0.913 for the overall scale.

Physical self-efficacy scale

In this study, the Physical Self-Efficacy Scale developed by Sun et al. (2005) was used. The scale was divided into two dimensions, Physical Self-Presentation Confidence and Perceived Physical Ability, and contained 10 items, such as 'I am quite physically strong'. The scale used a 6-point Likert scale ranging from 1 (strongly disagree) to 6 (strongly agree), with a higher total score indicating higher physical self-efficacy. In this study, the Cronbach's α score were 0.877 for perceived physical ability, 0.897 for physical self-presentation confidence, and 0.929 for the overall scale.

Data analysis

IBM SPSS 24.0 and AMOS 24.0 were used for data analysis in this study. SPSS was used for descriptive statistics (mean [M], standard deviation [SD], and correlation analysis). Structural relationships among the variables were calculated using structural equation modelling (SEM) in AMOS. Confirmatory factor analysis (CFA) fit

Table 1. Fit index of each variable and Cronbach's α .

Scales (Criteria)	Cronbach's $\alpha > 0.7$	$\chi^2/df < 5$	RMSEA < 0.08	SRMR ≤ 0.06	GFI > 0.90	CFI > 0.90	NFI > 0.90	TLI > 0.90
TL	0.940	3.033	0.067	0.040	0.922	0.958	0.939	0.948
EA	0.913	2.389	0.056	0.048	0.944	0.962	0.937	0.953
PSE	0.929	1.948	0.046	0.022	0.972	0.988	0.976	0.985

TL, transformational leadership; EA, exercise adherence; PSE, physical self-efficacy.

Source: Authors

Table 2. Descriptive statistics and correlation matrix of the variables.

Variable	M	SD	TL	EA	PSE
TL	4.022	0.496	1		
EA	3.874	0.533	0.609***	1	
PSE	3.860	0.835	0.332***	0.556***	1

*** $p < 0.001$. TL, transformational leadership; EA, exercise adherence; PSE, physical self-efficacy.

Source: Authors

indices chi-square (χ^2)/degrees of freedom (df), root mean square error of approximation (RMSEA), standardized root mean square residual (SRMR), goodness of fit index (GFI), normed fit index (NFI), Tucker-Lewis Index (TLI), and comparative fit index (CFI) were used to analyse the structural validity of the scale and the degree of model fit. The fit indices met the specified criteria, indicating good fit: $\chi^2/df < 5$ (Schumacker and Lomax, 2012), RMSEA < 0.08, SRMR ≤ 0.06 , GFI > 0.90, NFI > 0.90, TLI > 0.90, and CFI > 0.90 (Hu and Bentler, 1999).

Direct, indirect, and total effects among predictors, mediators, and outcome variables were analysed using a bias-corrected nonparametric percentile bootstrap method (Preacher and Hayes, 2008). The mediating role of physical self-efficacy in the effect of transformational leadership on exercise adherence was examined on this basis. In the data analysis, the bootstrap method was repeated 5000 times, and 95% confidence intervals were calculated. When the upper and lower limits of the confidence interval did not contain 0, the mediating effect was significant. Transformational leadership, exercise adherence, and physical self-efficacy were included as observed variables

in the analysis.

RESULTS

Reliability and validity tests

CFA yielded a Cronbach's α value of >0.7 (Taber, 2018) for the transformational leadership, exercise adherence, and physical self-efficacy variables. Thus, all three scales exhibited high reliability and validity (Table 1).

Descriptive statistics and correlation analysis

M, SD, and correlation analyses were performed for the three scales. The M score for the Transformational Teaching Questionnaire was

moderate to high (M = 4.022, SD = 0.496), the M for the Exercise Adherence Scale was moderate to high (M = 3.874, SD = 0.533) and the M for the Physical Self-Efficacy Scale was moderate to high (M = 3.860, SD = 0.835). These results demonstrate that the participants generally had positive attitudes towards perceived transformational leadership, exercise adherence, and physical self-efficacy. The relationship between the scales was examined through correlation analysis (Table 2). Transformational leadership was significantly positively correlated with exercise adherence ($r = 0.609$, $p < 0.001$) and physical self-efficacy ($r = 0.332$, $p < 0.001$). Exercise adherence and physical self-efficacy were also significantly positively correlated ($r = 0.556$, $p < 0.001$). The correlation coefficients ranged between 0.332 and 0.609, a low to medium level; therefore, no serious covariance

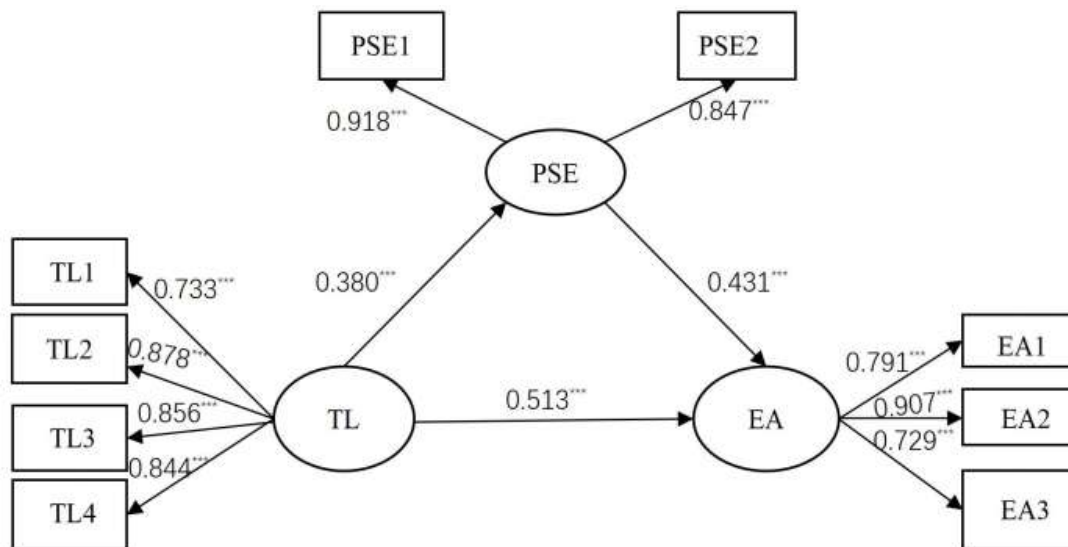


Figure 2. Structural equation model. *** $p < 0.001$, TL, transformational leadership; EA, exercise adherence; PSE, physical self-efficacy; TL1, idealized influence; TL2, inspirational motivation; TL3, intellectual stimulation; TL4, individualized consideration; PSE1, Perceived Physical Ability; PSE2, Physical Self-Presentation Confidence; EA1, behavioral habits; EA2, Studiousness; EA3, emotional experience.

Source: Authors

Table 3. Bootstrap analysis of mediation effect.

Paths	Estimate	95% Bootstrap CI		R ²
		Lower	Upper	
Standardized total effects				
TL→EA	0.677***	0.580	0.758	0.617
Standardized direct effects				
TL→PSE	0.380***	0.270	0.482	0.145
PSE→EA	0.431***	0.327	0.532	
TL→EA	0.513***	0.407	0.601	
Standardized indirect effects				
TL→PSE→EA	0.164***	0.115	0.222	

*** $p < 0.001$. TL, transformational leadership; EA, exercise adherence; PSE, physical self-efficacy.

Source: Authors

problem existed, and thus the next step in the analysis was undertaken.

SEM analysis

SEM analysis was used to test the research hypotheses. First, the model fit was tested. The model had good fit ($\chi^2/df = 2.956$, RMSEA = 0.066, SRMR = 0.029, GFI = 0.966, CFI = 0.981, NFI = 0.927, and TLI = 0.972). The structural model is shown in Figure 2.

After validation of the structural equation model, the mediation of physical self-efficacy in the relationship

between college students' perceptions of transformational leadership by PE teachers and exercise adherence was examined using the bootstrap method. This study examined the direct, indirect, and total effects among transformational leadership, exercise adherence, and physical self-efficacy (Table 3). Transformational leadership significantly positively affected physical self-efficacy ($\beta = 0.380$, $P < 0.001$). Transformational leadership explained 14.5% of the change in physical self-efficacy. Physical self-efficacy significantly positively affected exercise adherence ($\beta = 0.431$, $P < 0.001$). Transformational leadership significantly directly affected exercise adherence ($\beta = 0.513$, $P < 0.001$). The total

standardized effect was also significant when transformational leadership, physical self-efficacy, and exercise adherence were included in the analysis ($\beta = 0.677$, $P < 0.001$). Physical self-efficacy partially mediated the relationship between transformational leadership and exercise adherence ($\beta = 0.164$, $P < 0.001$).

DISCUSSION

Due to exercise adherence is key to the physical and mental health development of college students, research has investigated how to promote exercise adherence and its influencing factors; however, understanding of the mediating mechanisms remains lacking. This study demonstrated that college students' perceptions of transformational leadership by PE teachers significantly positively affected exercise adherence and that physical self-efficacy partially mediated the relationship between college students' perceptions of transformational leadership by PE teachers and exercise adherence.

Theoretical implications

In accordance with Hypothesis 1, this study demonstrated that transformational leadership by PE teachers, as perceived by college students, significantly positively affected exercise adherence. The results of this study support findings from previous studies that leadership positively influences individual behavioural persistence (Oketch and Ainembabazi, 2021; Price and Weiss, 2013; Yoo and Hwang, 2017; Bum, 2018). These findings suggest that transformational leadership is a valid predictor of exercise adherence and that PE teachers should employ transformational leadership to guide their students' efforts in physical exercise. By using transformational leadership to enable students to consider their ambitions and encourage them, PE teachers enable students to perceive care and support from them and to become more willing to commit to remaining physically active (Komarraju, 2013; Scales et al., 2020). These findings suggest that the more students perceive transformational leadership by their PE teacher, the greater their exercise adherence becomes.

Hypothesis 2 proposed that College students' perceptions of transformational leadership by PE teachers significantly positively affected student physical self-efficacy. The results of this study supported this hypothesis, suggesting that the more frequently PE teachers use transformational leadership, the more college students' physical self-efficacy increases. This finding supports existing research (Salanova et al., 2022; Turnnidge and Côté, 2018). In addition, the use of transformational leadership by PE teachers fosters trust and respect from students, enhances communication and interaction with students, leads to greater student

confidence in their athletic abilities, increases student interest and engagement in the classroom, and enhances college students' levels of physical self-efficacy (Komarraju et al., 2010; Bourne et al., 2015; Trigueros et al., 2020).

A critical finding of this study was that a direct and indirect relationship existed between college students' perceived transformational leadership by PE teachers and exercise adherence, with physical self-efficacy playing an indirect role in this process and with transformational leadership influencing exercise adherence primarily through physical self-efficacy.

The results of this study support Hypothesis 3, which proposed that physical self-efficacy mediates the relationship between transformational leadership and exercise adherence. Although research has shown that self-efficacy is key to individual behavioural choices and adherence (Collins et al., 2004), little research exists regarding how transformational leadership affects exercise adherence. This finding suggests that physical self-efficacy is a crucial mediator in the field of physical exercise research. Thus, the present research supports self-efficacy theory. Bandura (2004) argued that physical self-efficacy is central to participation in physical exercise; therefore, PE teachers with a transformational leadership style can effectively motivate students and guide them to greater awareness of their needs by respecting individual differences, caring for students, forming trusting teacher-student relationships, providing positive emotional support to students, and motivating students to work towards their goals (Beauchamp et al., 2010). This positive emotional support helps to enhance students' physical self-efficacy (Wang et al., 2022; Öqvist and Malmström, 2018). When their physical self-efficacy increases, college students become more confident in their athletic ability to overcome difficulties encountered in physical exercise and exhibit increasingly positive emotional responses to the perception of athletic ability, thereby minimising the interruption of regular physical exercise and facilitating the long-term maintenance of regular physical exercise.

Practical implications

The present research makes a number of practical contributions. First, it demonstrates that college students' perceptions of transformational leadership by PE teachers significantly positively affects their exercise adherence; therefore, universities could invite educational experts to train and instruct teachers in transformational leadership theory and to guide and encourage PE teachers to use transformational leadership regularly in PE teaching and management and the organisation of sports competitions. Second, this study demonstrated that physical self-efficacy partially mediates the relationship between college students' perceptions of

transformational leadership by PE teachers and exercise adherence. Therefore, university leaders should encourage PE teachers to form positive teacher–student relationships by listening to students’ ideas and suggestions and paying attention to students’ psychological needs in order to make students feel motivated and perceive care from their PE teachers, thereby improving college students’ physical self-efficacy and physical exercise adherence.

Limitations and future directions

There are several limitations in this study. First, because this study was cross-sectional, it could not determine causal relationships among the variables and provided insight only into the impact of the relationships among the variables studied; therefore, a longitudinal study should be conducted in the future. Second, the relationships among the study variables were analysed at the college student level. This feature may have hindered the diversity of the data by neglecting school-level and PE teacher–level perceptions. Thus, future research could explore college student exercise adherence in a cross-level analysis. Finally, this study was conducted using only self-reported questionnaires. Therefore, future research could supplement these questionnaires with qualitative interviews for more in-depth analysis.

Conclusion

The following conclusions were drawn from this study: College students’ perceptions of transformational leadership by PE teachers significantly positively affected student exercise adherence. College students’ perceptions of transformational leadership by PE teachers significantly positively affected student physical self-efficacy. Physical self-efficacy partially mediated the relationship between college students’ perceptions of transformational leadership by PE teachers and student exercise adherence. Overall, the more college students perceive the transformative leadership of physical education teachers, the more it contributes to the improvement of college students’ physical self-efficacy, thus promoting their exercise adherence.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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