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## Evaluation of the impact of dialogic pedagogical gatherings on sustainable development training for future teachers

Estefanía Martínez-Valdivia<sup>a</sup> , M. Carmen Pegalajar-Palomino<sup>a</sup>  and Diana Amber-Montes<sup>b</sup> 

<sup>a</sup>Pedagogy Department, Didactic and School Organization Area, University of Jaén, Jaén, Spain; <sup>b</sup>Pedagogy Department, Theory and History of Education, University of Jaén, Jaén, Spain

### ABSTRACT

This paper examines the social and academic effects of dialogic pedagogical gatherings (DPG) on sustainable development training for Education degree students at university. The quantitative study employs a descriptive, correlational, and inferential research methodology, utilizing a questionnaire with 325 respondents to assess the impact of DPG. Students assign high scores to the methodology's influence on their formative process, with a notable emphasis on the academic environment by comparison with social impact. Gender analysis reveals that women attribute more favorable scores, particularly in 'Student-context interaction' and 'Participation'. Strong correlations exist between themes assessing social and academic impacts of DPG, highlighting certain themes' predictive capacity. These findings underscore the significance of DPG as successful and pertinent actions for sustainable curricula, particularly in Education degrees.

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## Introduction

### *Quality higher education for training toward sustainable development*

Higher education at the international level is in a process of adaptation to emergent social changes and new social demands, such as those of the technological revolution, sustainability, gender equality, climate change, etc. These 21st-century challenges must be faced in various fields, but it is necessary for higher education in particular to exercise strong leadership, which will involve an effort toward institutional transformation and a political turn oriented on the flexibility of regulatory processes (CRUE, 2022).

In this context, the well-known Sustainable Development Goals (SDG) proposed by the United Nations in 2015—with the aim of eradicating poverty, protecting the planet, and ensuring prosperity for all as part of a new sustainable development agenda—become especially relevant. They are considered the global roadmap for countries to follow in order to overcome economic and geopolitical divisions, as well as to restore trust and solidarity (United Nations, 2023). Issues such as lifelong and lifewide learning, equity, gender equality, and inclusion in education systems are particularly relevant in the 2030 Agenda

**CONTACT** Estefanía Martínez-Valdivia  [evaldivi@ujaen.es](mailto:evaldivi@ujaen.es)  Pedagogy Department, Didactic and School Organization Area, University of Jaén, Jaén, Spain

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(Monsalve et al., 2021). With particular regard to Spain, the promotion of sustainable development involves the implementation of different cross-cutting programmes that contribute to the Sustainable Development Goals Fund (SDG Fund). The SDG Fund manages joint programmes in 22 countries, focused on the main lines of action mentioned above, and in most of these programmes education has provided the basis for their foundation (Martínez & Lloret, 2020).

In this context, Goal 4 is of greatest interest in the educational field, as it consists of 'providing quality education for all'. To ensure quality education in this way, one of the main actions is the inclusion of Education for Sustainable Development in educational curricula and, consequently, in teaching activities. Among the awareness actions proposed by CRUE (2022) for the implementation of the 2030 Agenda, the following should be implemented in the higher education context: introduction of participatory teaching methods and new competencies within curricula in order to foster curricular sustainability; incorporate innovative and digital tools to help bring the SDG debate into the classroom; promote and support the incorporation of SDG indicators within university quality assessment systems; incorporate the principles of the 2030 Agenda into degree final projects and external and volunteer internships; and promote inclusive education and transversal competencies for global citizenship.

Likewise, higher education can do a great deal of work to meet SDG 4, especially in the Early Childhood and Primary Education degrees. Increasing the number of young people trained in promoting sustainable development, which makes them better qualified as professionals, especially in respect of future teachers, means that they will in turn pass on their training and experience to new generations of students, who will be the future of citizenship. Higher education must also empower and mobilise young people, provide students with the knowledge, skills, and motivation to understand the SDGs, provide the necessary training to implement them, and build the capacity of students from developed countries to implement the challenges addressed by the SDGs (SDSN Australia/Pacific, 2017).

The interest that this topic arouses within the field of education is evident in recent studies that highlight the importance of curriculum sustainability and the training of professionals in following SDG guidelines. Research carried out by Dieste et al. (2019) points out how the educational curriculum has been made sustainable through the inclusion of projects that act in accordance with the aims of the 2030 Agenda. In the work of Escámez and López (2019), the authors propose that it is necessary to train Education degree students in education for sustainable development as the principal driver of change in society. Murga (2015) highlights the main competencies that a teacher must develop in order to achieve curricular sustainability. For their part, Poza et al. (2022) focus on analysing the curricula of 99 Spanish universities, concluding that the curricula are based on sustainable development and that a great effort is being made by teachers to achieve the objectives set. Finally, research by Serrate et al. (2019) studies the university degrees of 9 Spanish universities, focusing on the SDG-related competencies that they include, and highlighting their strengths and possible improvements at a pedagogical and organisational level. For all of the above reasons, it should be considered essential to train university students, especially in Bachelor's Degrees in Education, in knowledge and competencies related to the SDGs, in order to allow future teachers to acquire in their professional practice the relevant attitudes and values to meet the social demands and difficulties constantly presented by our society (Martínez-Valdivia et al., 2020; Olmos et al., 2019).

Accordingly, in the view of various authors, future teachers must acquire a variety of skills and abilities through their training for sustainable development (Akça, 2019; Androshchuk et al., 2020; Pegalajar et al., 2022; Tapia, 2019). On the one hand, developing a global vision of reality and knowledge, based on the idea of preserving nature, enriching sustainable development, and promoting interaction between nature and people. On the other hand, the capacity to combine the contributions of knowledge derived from different subjects in order to resolve conflicts and problems, while maintaining one's own perspective on a problematic situation. In addition, one must become conscious of the responsibility, as an individual and as part of society, of being guided by ethics in education.

In order to provide quality initial teacher training based on education for sustainability in a manner that is effective and that develops the competencies outlined above, it is necessary to apply methodologies that facilitate this path. The awareness of societal issues is becoming increasingly important for ensuring sustainability in all societies (Zaky & Szameitat, 2019). To this end, the United Nations (2017) has outlined some methodological recommendations as guidance for university faculties, among which

the following stand out: a student-centered approach, in which the basis for stimulating learning is prior knowledge and lived experience; action-based learning, which translates into the methodological strategy of Service-Learning (SL), which is widely implemented in this context and in which students participate in actions and reflect both on their experiences in the desired learning process and on their own personal development; transformative learning, which seeks to enable students to change the way they see the world, in order to understand it better, with the teacher being responsible for facilitating this form of learning. The above types of concerns have, in recent years, been the basis for a proliferation of research that is focused on analyzing active methodologies that facilitate teacher training in Education for Sustainable Development. Firstly, Service-Learning is considered the most effective methodology for achieving such training, promoted by organisations such as CRUE (2015). In addition, there have been several authors who consider this method to be the most relevant in relation to education for sustainable development (Martínez, 2010; Ortega et al., 2021; Tejedor et al., 2019). This methodology consists of learning by contextualizing the content in the educational reality and applying the knowledge acquired in responding to the needs of that context. Problem and Project Based Learning (PBL), another active methodology, has been advocated by various authors (Albareda et al., 2019; Alonso & Berasategi, 2017; Bugallo & Vega, 2020; Hernández et al., 2021). The implementation of this method has been shown to lead to the acquisition of high levels of sustainability-related competencies in students. Among the results achieved are active participation in social projects. Such involvement is the consequence of students confronting situations in which they have to develop critical judgment, establish social commitment, make reasoned and well-founded decisions in educational terms, and even go so far as developing a proposal for action, requiring the activation of the various kinds of knowledge learned during the educational process. In short, it is a methodology in which students acquire a transformative education.

Gamification of education allows educators to respond to the different learning levels of students in the classroom. It is also a method that facilitates student autonomy in the development of their learning (Tomas et al., 2019; Yllana et al., 2021).

Finally, methods focused on dialogic learning such as discussion forums and dialogic gatherings have also proven to be suitable methodologies for ESD training (Danaher et al., 2021; Martínez-Valdivia et al., 2021; Sedova, 2021; Sherry, 2019). These involve learning through human interactions, thereby transforming the intersubjective constructions of the participants (Fecha, 2015; Pérez, 2022).

### ***Dialogic pedagogical gatherings in initial teacher training***

Dialogic gatherings have been a successful practice developed in schools that are part of the Learning Communities Network (Aguilera et al., 2010). They support learning through the collective construction of knowledge and meaning, based on the dialogue generated among all those participating (CREA, 2018). This methodology arose in the school setting, as a successful methodology for the achievement of inclusion and academic improvement for all students. The most common dialogic gatherings are literary ones; however, gatherings of different kinds can be carried out in schools in accordance with the area to be taught, such as musical, mathematical, artistic, scientific, or pedagogical gatherings, as in this case. This type of learning is based on various strands of theoretical work: in particular, Freire's theory of dialogical action (2002), Habermas' theory of communicative action (1987), and Wells' term of dialogical enquiry (2001). Furthermore, it derives from the concept of Ecopedagogy proposed by authors such as Gadotti (2017), Gutiérrez and Prado (2000), and Antúnez and Gadotti (2006), who support Freire's work, understanding this concept as an epistemological framework beyond education itself. According to Fernández and Conde (2010), it is understood as a social and political movement in pedagogy, involving a model of education based on ecological sustainability, leading to a change in economic, social, and cultural structures (Gadotti, 2017). Ultimately, it can contribute to the development of values focused on sustainable development, ethics, social justice, and equity; diversity and interdependence of life; society's concern for coexistence with all beings on the planet; respect for human rights and prevention of that which can cause harm (Ruiz et al., 2021).

It is a methodology that facilitates the participation of all students, regardless of their personal, social, cultural, or educational characteristics. It is very useful in supporting the academic success of all and,

more specifically, it is effective for those who come from disadvantaged and socially excluded backgrounds.

Through the application of this methodology, students acquire educational skills such as the comprehension of complex texts, through a shared learning process in which the student is the protagonist. Yet, beyond these aspects, dialogic gatherings also support the learning and development of competencies related to communication and expression, critical thinking, and respect for the opinions and ideas of others (Flecha, 2015).

Dialogic pedagogical gatherings promote learning based on communication, placing dialogue at the center of student learning (Aubert et al., 2009). This way of learning has been put into practice in all educational stages, from early childhood education through to university education (Aguilar, 2017; Ceballos et al., 2020; García et al., 2016; Roque do Nascimento & Álvarez, 2016).

For learning to be dialogic, authors such as Flecha (2015) and the CREA research group (2018) establish seven fundamental principles: (a) Egalitarian dialogue: the intervention is valued based on arguments and not on relations of power or imposition; (b) Cultural intelligence: it combines a range of aspects of interaction; in other words, it goes beyond academic intelligence, gathering practical or communicative intelligence; (c) Transformation: the aim is to achieve education for action; (d) Instrumental: it seeks to overcome difficulties in learning in basic subjects established in the curriculum through the development of competencies and effort, in order to help students where they need it most; (e) Creation of meaning: this occurs when the student, learning in the educational center, finds meaning in their learning, and finds it to be important; (f) Solidarity: it means offering an equal education for all, in which the same opportunities are provided; and (g) Equality of differences: to offer a quality education in which all people, regardless of their personal, social, cultural, ethnic, etc. characteristics, are included and their voices are taken into account.

Dialogic discussion groups differ from debate and other didactic strategies based on dialogic learning on the basis that, in addition to complying with the seven principles mentioned above, they have a clear and structured procedure for their application in the classroom, according to CONFAPEA (2012), which is as follows:

1. First, students select the reading text to be worked on in the gathering, from among a range of texts proposed by the teacher, and they explain why they prefer to read one text and not another;
2. The second step consists of agreeing among the participants how many pages of the selected text they will read, in order to participate in the dialogue discussion;
3. Thirdly, each participant will read the agreed pages at home and underline those lines that arouse their interest or that seem significant to them, for whatever reason;
4. The fourth step consists of holding the discussion. The teacher is one of the participants and will have the task of acting as mediator;
5. Taking it in turns to speak, the participants will read the text they have underlined aloud and make comments about the ideas that arose or the reasons why they highlighted these sections;
6. The discussion will follow each passage that the participants want to point out in succession, respecting the order of the chapters, until the text is finished.

It may also be observed that the training of future educators through dialogic pedagogical gatherings promotes, on the one hand, a societal impact, because students will acquire a comprehensive training that involves the development of actions oriented on social justice and an ethical perspective. In other words, we can understand the methodology as supportive of university social responsibility. This aspect consists of being an agent of mediation between teaching and learning, within an education based on the values of respect, empathy, inclusion, freedom, and equality, with responsibility and vocation (Capella et al., 2019). In this way, it is possible to train citizens to become responsible for their own actions and for the environment in which they live.

On the other hand, from an academic perspective, future educators are made aware of the Sustainable Development Goals and their targets. In this way, they will learn to be aware of the

necessary inclusion of active methodologies in their future professional practice. This constitutes one of the means for achieving sustainability in the educational curriculum (Albareda et al., 2019; Danaher et al., 2021; Martínez-Valdivia et al., 2023; Yllana et al., 2021).

For all these reasons, we consider that the present research is of great significance in the current period. The objective of this research is to analyze the academic and social impact of dialogue-based learning through dialogical pedagogical gatherings on students undertaking various Education degrees. The implementation of this active methodology offers quality training to future teachers and also represents an alternative way of learning, which can subsequently be put into action during their professional practice.

For all these reasons, together with the described characteristics of this methodology, considered successful in the school context (Ceballos et al., 2020; García et al., 2016), it can be stated that the research presented is truly innovative in the university context. There are few works that pursue the same objective (Malagón and González (2018), given that such studies tend to focus on other types of gatherings such as musical, literary, *et cetera* (Fernández-Jiménez, 2022; La Orden & Foncillas, 2021; Ortube et al., 2021); or they address contexts other than the university, such as the school or prison context (Ceballos et al., 2020; Flecha et al., 2013), given that this is an appropriate learning methodology for students of all ages and is well adapted to areas of social exclusion.

### Implementation

This research is carried out in the course of Early Childhood and Primary Education degrees at the University of Jaén; specifically, in the compulsory core subject ‘General Didactics’ of both degrees, taken by students in their first year.

Thus, the implementation of this didactic strategy is proposed for the development of theoretical content in the subject to be taken by students in practical classes. A total of 6 study sessions are proposed, commencing once the students have acquired a partial understanding of the content included in the didactic guide and, therefore, possess enough knowledge to read a text related to the subject. In addition, prior to commencement, an adequate organization of the discussion group and the participation of each of the members is ensured, with consideration to various presentation dynamics within the group, thereby facilitating the integration of group members and strengthening the confidence of each participant.

Subsequently, the students enrolled in these subjects participate in a didactic experience based on the implementation of the dialogic pedagogical gatherings methodology, proposed according to several phases, explained in the Table 1.

Collection of information is carried out once the student has participated in the dialogic learning experience. For this purpose, the research team administers the questionnaire to students, encouraging them to respond as truthfully as possible, and the researchers ensure the confidentiality and anonymity of the data collected. In addition, participants are informed that said research complies with the ethical principles proposed in the Declaration of Helsinki of 1975. The student must accept the statement of informed consent prior to the completion of the questionnaire.

**Table 1.** Implementation process of dialogic gatherings.

Before	<ul style="list-style-type: none"> <li>• Introduction: presentation of dialogical learning methodology</li> <li>• Intentional selection of pedagogical texts: collaborative work between teacher-students</li> </ul>
During	<ul style="list-style-type: none"> <li>• Group work in the classroom according to the principles of dialogical learning: egalitarian dialogue, cultural intelligence, transformation, instrumental, creation of meaning, solidarity, and equality of differences.</li> <li>• Small groups, grouped in the shape of a semicircle</li> <li>• Teacher: acts as moderator and records student participation</li> </ul>
After	<p>Evaluation of the student’s learning process according to these indicators:</p> <ul style="list-style-type: none"> <li>• Prior preparation of the text</li> <li>• Knowledge and mastery of the text</li> <li>• Participation</li> <li>• Use of paraverbal elements (tone, timbre, volume, pauses, etc.)</li> <li>• Use of nonverbal resources (gestures, posture, etc.)</li> </ul>

## Method

### Design

This study responds to a previous quantitative study, based on a descriptive, correlational, and inferential methodology. It seeks to understand Education degree students' evaluations of the social and academic impact of dialogic pedagogical gatherings carried out during their initial teacher training process.

This research is undertaken within a teaching innovation project called 'Implementation of active methodologies based on dialogic learning for sustainable development in Education degree students' (PIMED12\_202022), financed by the Office of the Vice-rectorate for Coordination and Quality of Teaching at the University of Jaén.

### Objective and research questions

This paper aims to analyze how students of education degrees are impacted both socially and academically by dialogue-based learning through dialogic pedagogical gatherings. It presents results obtained from research carried out in the Early Childhood Education and Primary Education degrees at the University of Jaén, regarding learning based on dialogic pedagogical gatherings.

In addition, and to achieve this general objective, the following specific objectives have been considered:

- Study Education students' evaluations of the social and academic impact of dialogical pedagogical gatherings in their training process;
- Identify statistically significant differences between factors examining the social and academic impact of dialogic pedagogical gatherings with respect to the gender of students;
- Examine the degree of relationship between factors that evaluate the social and academic impact of dialogic pedagogical gatherings in university Education students;
- Identify the predictive capacity of certain factors for the evaluation of the social and academic impact of dialogic pedagogical gatherings in the initial teacher training.

Based on the intended purposes of this study, these research questions are posed:

- What is the Education student's assessment of dialogic pedagogical gatherings?
- Are there statistically significant differences in students' evaluations of dialogic pedagogical gatherings according to their gender?
- Is there a relationship between the social and academic implications of dialogic pedagogical gatherings in university Education students?
- Which factors have predictive capacity for the evaluation of the social and academic impacts of dialogic pedagogical gatherings in the initial teacher training process?

### Sample

The population of this study is composed of first-year students in Early Childhood Education and Primary Education degrees at the University of Jaén ( $N = 665$ ). The sample was selected using intentional nonrandom sampling ( $n = 325$ ); its representativeness was ensured to a confidence level of 95%. In this case, the research team implemented the didactic experience and facilitated the completion of the questionnaire for groups A and B of both degrees, given the availability and the involvement of the responsible faculty.

Regarding the fundamental characteristics that define this sample, it is worth noting that 31.7% are men, compared to 68.3% being women. Their ages range, for 70.1% of the sample, between 18 and 20 years. In addition, 70.6% affirm that they have not previously participated in dialogic learning experiences, while 29.4% affirm that they have used this type of methodological tool in previous stages of their education.

## **Instrument**

For data collection, a questionnaire is used to assess the impact of the educational practice of dialogic gatherings, designed and validated by Malagón and González (2018). It is a self-administered questionnaire, supported by the epistemology of dialogic learning theories, which meets scientific guarantees of reliability and validity.

Items are formulated according to statements in which respondents must indicate their degree of agreement or disagreement based on a scale ranging from 1 (*totally disagree*) to 5 (*totally agree*). Regarding the structure of the instrument, it is worth noting that all the items are organized according to two large dimensions: firstly, the dimension linked to the analysis of 'Social Impact', which includes the following pertinent themes: 'Transformative perspective', describing the transformative content in the performance of dialogic gatherings, based on the engagement of concrete cooperation skills, the promotion of constructive relationships, and the stimulation of commitment among the gathering participants in respect of volunteering; 'Student-context interaction', grouping together elements related to the dialogic technique implemented in the group work: predisposition to understand the text in collaboration with others, improved understanding of culture and society, and closer affinity with artistic expression and the patrimonial value of literature; 'Generation of meaning', which includes elements that deepen the critical and supportive spirit of the participants and that emphasize the elimination of racial stereotypes, in addition to supporting the acceptance of arguments on the basis of their validity; 'Dialogue-action', which includes elements that detail the interactions of participants in the social world and the results of their actions in a particular interaction context.

The second dimension relates to the analysis of 'Academic Impact', which encompasses the following themes: 'Solidarity practices', which includes elements referring to dialogic learning as a supportive space in which participants develop empathic capacity, create expectations of success, and promote attitudes of respect, resolving their differences through dialogue; 'Instrumental dimension', which is made up of the capacities acquired by participants in this educational activity: reading habit, oral expression, improved vocabulary, and understanding of key concepts; 'Participation', referring to the work of the gathering's moderator, who should promote equal participation among all members, as well as the ability to express oneself freely, and the development of active listening; 'Equal dialogue', which is composed of elements referring to the participation of all students in said educational action.

Designed based on the theories of dialogic learning, this instrument has been evaluated by a group of expert judges belonging to the Andalusian University Subnetwork of Learning Communities (SAUCA). The instrument has been piloted by teaching staff and volunteers participating in the educational performance associated with educational centers transformed into learning communities. For its part, the reliability coefficient analysis, obtained from Cronbach's Alpha coefficient, shows data above 0.974, which confirms that the instrument is reliable. Furthermore, the factor analysis reveals the existence of eight themes (distributed according to the dimensions of social and academic impact) in the questionnaire that explain 75.30% of the total variance.

For this study, the validity and reliability of the instrument has also been ensured. Thus, the exploratory factor analysis carried out reveals, after the varimax rotation, the existence of eight factors (distributed according to two large dimensions linked to the social and academic impact of the dialogic pedagogical gatherings) that explain 75.29% of the total variance. The KMO sampling adequacy index reaches a value of .969 and Bartlett's test of sphericity is 7785.208 ( $p = .000$ ). For the reliability analysis, Cronbach's Alpha method was used, obtaining a value of .958, as well as that of the two halves (.921 and .926).

## **Analysis of data**

Once the questionnaire has been completed, IBM SPSS for Windows software (version 27) is used for the statistical analysis of the data. In this regard, a descriptive analysis of the different themes that make up the two dimensions of the questionnaire is proposed below; the most outstanding results for each of the themes are identified. In addition, with reference to the sociodemographic variable 'student gender', a comparison of means test has been carried out from the variance analysis (ANOVA). The Tukey test

performed *a posteriori* makes it possible to locate these differences between all the pairs of means in the context of the total sample. Finally, in order to know the degree of relationship between the themes and the predictive capacity of some of the latter, we have used the Pearson correlation coefficient and a multiple linear regression analysis (stepwise) to determine if there is an influence between predictor variables and criteria.

## Results

### Descriptive statistics

To answer the research question, 'What is the education student's assessment of Dialogical Pedagogical Gatherings?', a descriptive analysis (Mean =  $M$  and Standard Deviation =  $SD$ ) is presented, as well as the skewness and kurtosis values for each of the dimensions of the questionnaire and for the themes that are included within each of them.

Analyzing the results presented in Table 2, we observe that the student evaluations of the impact of the dialogic pedagogical gatherings show very satisfactory results, being in both dimensions greater than 4; however, the academic field stands out by comparison with the social impact.

For each theme included in the questionnaire, results show average values between 4.54 and 4.00, with an  $SD$  of less than 1 for all themes. In respect of the highest values, equal participation among all members stands out within the academic impact dimension, and, in the social impact dimension, the highest scoring theme relates to the generation of meaning in deciding on one's life project. As regards the lower values, the themes which stand out relate to the commitment of participants to the reality in which they are immersed and the effect that this has on the student's school performance, and the development of solidarity practices among participants, in order to accelerate the learning of reading among all.

Asymmetry and kurtosis values for each of the questionnaire items show scores higher than expected according to the normality criteria, exceeding values within the threshold  $\pm 1.5$  (Pérez & Medrano, 2010). However, univariate normality of the data is retained, given authors such as Kline (2011) or Pérez et al. (2013) propose skewness values of less than 3 and kurtosis values of less than 10. For their part, Finney and DiStefano (2006) indicate maximum values of 2 for skewness and 7 for kurtosis to determine that the variables in a questionnaire have normal distributions.

### Analysis of variance: $t$ test according to gender

In relation to the research question 'Are there statistically significant differences in students' evaluations of Dialogical Pedagogical Gatherings according to their gender?', an analysis of variance is presented (using the Student's  $t$  test for independent samples) (Table 3).

Results reveal statistically significant differences for 'Student-context interaction' ( $t(317) = -1.38$ ), which evaluates the social impact of the dialogic pedagogical gatherings. In the evaluation of the academic impact of this methodological strategy, the existence of statistically significant differences is most prominent in 'Participation' ( $t(322) = .20$ ).

The analysis of means indicates more favorable scores on the part of women, compared to male students, in response to the question of the dialogic technique involving group work for the advancement

**Table 2.** Descriptive analysis.

	$M$	$SD$	Asymmetry	Kurtosis
Social impact	4.14	.47	-.63	1.50
Transformative perspective	4.00	.52	-.53	.86
Student-context interaction	4.14	.56	-.64	.78
Generation of meaning	4.37	.56	-.83	.41
Dialogue-action	4.27	.57	-.94	1.52
Academic impact	4.16	.42	-.50	.23
Solidarity practices	4.09	.46	-.3. 4	-.30
Instrumental dimension	4.14	.56	-.65	.17
Participation	4.54	.56	-1.49	2.77
Equal dialogue	4.25	.70	-.66	-.37

**Table 3.** *t* Test according to gender.

		Gender		<i>t</i>	<i>p</i>
		Women <i>M</i> ( <i>SD</i> )	Man <i>M</i> ( <i>SD</i> )		
Social impact	Transformative perspective	4.0 (.53)	3.9 (.48)	-2.02	.26
	Student-context interaction	4.1 (.59)	4.0 (.48)	-1.38	.04*
	Meaning generation	4.3 (.58)	4.3 (.51)	-.62	.18
Academic impact	Dialogue-action	4.3 (.56)	4.1 (.57)	-2.34	.91
	Solidarity practices	4.1 (.44)	3.9 (.46)	-2.41	.95
	Instrumental dimension	4.2 (.55)	4.0 (.55)	-3.00	.95
	Participation	4.6 (.51)	4.5 (.59)	.20	.00*
	Equal dialogue	4.0 (.70)	4.3 (.68)	-2.78	.98

\**p* < .05.

**Table 4.** Correlation analysis.

	Transformative perspective	Student-context interaction	Solidarity practices	Instrumental dimension	Participation	Meaning generation	Dialogue-action	Equal dialogue
Transformative perspective	1	.647**	.566**	.621**	.415**	.529**	.502**	.443**
Student-context interaction		1	.708**	.666**	.556**	.695**	.636**	.528**
Solidarity practices			1	.707**	.456**	.633**	.644**	.420**
Instrumental dimension				1	.405**	.570**	.574**	.456**
Participation					1	.634**	.534**	.523**
Meaning generation						1	.682**	.701**
Dialogue-action							1	.654
Equal dialogue								1

\*\**p* < .001.

of knowledge and improvement of coexistence. This theme relates to the student's predisposition to understand the text in collaboration with others, whether they show coherence and cohesion in their discourse and their own actions, in addition to their affinity with artistic expression and the value of classical literature. More favorable scores were also obtained for women when analyzing the degree of participation in the dialogic pedagogical gatherings. Women respondents give ample praise to the figure of the moderator, who promotes equal participation among participants, as well as the ability to express themselves freely, and the development of active listening.

### Correlation analysis

The correlation analysis carried out aims to answer the research question 'Is there a relationship between the social and academic implications of dialogic pedagogical gatherings in university Education students?' The aim is to study the existence of linear relationships between variables linked to the social and academic impact of this teaching strategy in initial teacher training.

This analysis reveals a significant Spearman's rho coefficient for all themes in the questionnaire, demonstrating reciprocal relationships between them. As can be seen in Table 4, the highest correlation value occurs between 'Student-context interaction' and 'Solidarity practices' ( $r = .708$ ), while the lowest value is located between 'Instrumental dimension' and 'Participation' ( $r = .405$ ).

### Stepwise multiple linear regression analysis

Once the existence of statistical correlations was verified, and in order to answer the research question 'What factors have predictive capacity for the evaluation of the social and academic impact of dialogic pedagogical gatherings in the initial teacher training process?', a linear regression analysis was carried out to study the relationship between certain variables considered of interest. In this case, the dimensions 'Social Impact' and 'Academic Impact' defined by Malagón and González (2018) are taken as a reference for the evaluation of the impact of educational action based on dialogic pedagogical gatherings. For each of these dimensions, the factor of greatest interest for said dimension has been selected as the dependent variable, while the rest of the factors of the dimension are considered independent variables.

Firstly, with a focus on the analysis of the social impact of dialogic pedagogical gatherings, 'Student-context interaction' was selected as the criterion (dependent) variable; it is associated with a dialogic

**Table 5.** Linear regression analysis (Successive Steps) for student-context interaction.

		$\beta$	Standard Error	$\beta$	$t$	$R^2$
Model 1	Meaning generation	.68	.04	.68	16.58	.47**
Model 2	Meaning generation	.46	.04	.47	11.17	.60**
	Transformative perspective	.45	.04	.42	10.00	
Model 3	Meaning generation	.37	.05	.37	7.29	.61**
	Transformative perspective	.41	.04	.38	8.84	
	Dialogue-action	.16	.05	.16	3.12	

\* $p < .001$ .**Table 6.** Linear regression analysis (successive steps) for solidarity practices.

		$\beta$	Standard Error	$\beta$	$t$	$R^2$
Model 1	Instrumental dimension	.59	.04	.72	12.180	.52**
Model 2	Instrumental dimension	.51	.04	.63	10.921	.59**
	Participation	.23	.04	.28	4.919	
Model 3	Instrumental dimension	.48	.04	.58	9.943	.62**
	Participation	.20	.04	.24	4.287	
	Equal dialogue	.11	.04	.16	2.823	

\* $p < .001$ .

technique that involves group work for the advancement of knowledge and the improvement of coexistence. Predictor variables (independent), on the other hand, are related to: 'Transformative perspective', 'Generation of meaning', and 'Dialogue-action'.

Results of the regression analysis, which are presented in Table 5, reveal three significant models, none of the variables having been eliminated. The first, 'Generation of meaning', explains 47% of the variance and shows a significant regression coefficient ( $\beta = .68$ ). This theme, referring to the fact that the participants in the dialogic pedagogical gatherings can decide on and act on their life project, constitutes a predictor variable for the 'Student-context interaction'. The second model explains 60% of the variance and includes, in order of relevance, the theme linked to the generation of meaning for life projects ( $\beta = .47$ ), and the commitment to reality among participants ( $\beta = .42$ ). Finally, the third model explains 61% of the variance and includes as variables, according to their predictive capacity: the transformative perspective of the participants in the dialogic pedagogical gatherings ( $\beta = .38$ ), the generation of meaning ( $\beta = .37$ ), and the interactions of the participants with the social world ( $\beta = .16$ ).

Secondly, regarding analysis of the academic impact of dialogic pedagogical gatherings, the selected criterion variable is 'Solidarity Practices'; creating a solidarity space in which participants develop empathic capacity and create expectations of success, and in which an attitude of respect and learning is promoted for all. In turn, 'Instrumental dimension', 'Generation of meaning', and 'Dialogue-action' have been selected as predictor variables.

For these themes, results of the regression analysis, collected in Table 6, also present three significant models, none of the variables having been eliminated. The first model explains 52% of the variance, and includes as a predictor variable ( $\beta = .72$ ) the instrumental learning acquired by the participants in the dialogic pedagogical gatherings (reading habit, ability to express oneself orally, vocabulary increase, understanding of key concepts, etc.). The second model explains 60% of the variance and includes, in order of relevance, themes focused on the instrumental dimension of student learning ( $\beta = .63$ ) and the participation of those present at the dialogic pedagogical gatherings ( $\beta = .28$ ). Finally, the last model explains 62% of the variance, and includes among its predictor variables, in order of relevance, themes linked to the instrumental dimension of learning ( $\beta = .58$ ), the participation of those involved in the dialogic pedagogical gatherings ( $\beta = .24$ ), and the assessment of the contributions of each participant ( $\beta = .16$ ).

## Discussion and conclusions

In view of the above analysis, addressing the general and specific objectives of this study, it is concluded that DPG represents a teaching methodology that has benefits for the training process of future teachers. In this regard, we concur with Aguilar (2017), who highlights the transformative power of DPG through egalitarian dialogue and collective reflection, and with the conclusions of Lozano et al. (2019), who emphasize the usefulness of DPG in the achievement of professional teaching competences.

The high scores given by the students surveyed regarding the academic and social impacts of this methodology and the high degree of agreement among the students, as manifested in the low standard deviations of the results, imply a recognition of the above claims by those involved in the DPG actions. This positive assessment by participants is consistent with results obtained in other studies carried out both with virtual training processes (González et al., 2023) and with face-to-face processes, as concluded by Martínez-Valdivia et al. (2021). These authors, respectively, point out a high predisposition and interest on the part of education students in the implementation of DPG in their future teaching practice.

Within the high scores given by participating students, the impact of this methodology in the academic field slightly outweighs the perceived social impact. This stands in contrast to the results obtained by González et al. (2023) in the application of the same instrument after carrying out the DPG in virtual environments; these researchers found that the social impact dimension was more valued. This discrepancy can probably be explained by the type of implementation of the activity and the context in which it was carried out, although its determination would require further research on this variable. However, in both cases, the high values obtained in the two dimensions (academic and social) reinforce the usefulness of the teaching method.

The theme related to participation, and belonging to the academic dimension, scores most highly among those surveyed, who give praise to the equal participation permitted to them by the DPG activity, with the assistance of the moderator. In the social dimension, it is the 'Generation of meaning' theme which stands out, and which, following on from the work of Malagón and González (2018), emphasizes the acceptance of arguments for their validity, reinforcing the critical and supportive spirit of the participants. The themes attaining the lowest values in the two dimensions (Transformative Perspective and Solidarity Practices) have means above four, which nonetheless indicates the success of the methodology from the perspective of the participants.

Analysis by gender yields significant results for 'Student-context interaction' and 'Participation', respectively, indicating a greater appreciation of these themes by women. This trend, which in previous studies was posited as attributable to the greater intrinsic motivation presented by women (Amber & Morales, 2023; Sánchez et al., 2022), must be observed with caution, since it may be influenced by the greater presence of women in Education degrees (Verástegui, 2019).

In addition, our analysis of the results reveals strong correlations between the themes evaluating the social and academic impacts of the methodology. The highest correlation value is found between 'Student-context interaction' and 'Solidarity practices', belonging to the social impact and academic impact dimensions respectively. This relationship between the two themes can be explained insofar as teamwork and the positive predisposition to understand the text in collaboration with the rest of the participants favor the creation of a supportive space in which empathic capacity is developed (Malagón & González, 2018). By contrast, the lowest correlations are observed between 'Instrumental dimension' and 'Participation', both belonging to the academic impact dimension.

Furthermore, our analysis reveals the predictive capacity of certain themes for the evaluation of the social and academic impact of DPG in teacher training. The stepwise multiple linear regression analysis reveals significant models for 'Student-context interaction' and "Solidarity practices". The model that best predicts 'Student-context interaction' indicates a significant adjustment of the independent variables 'Generation of meaning', 'Transforming perspective', and 'Dialogue-action'. For its part, in the model for the criterion variable related to Solidarity practices, it was found that the 'Instrumental dimension', 'Participation', and 'Egalitarian dialogue' have a predictive effect on solidarity practices. Hence, instrumental learning, participation, and dialogue are shown to have a predictive capacity for the variable 'Solidarity practices'. This result gives further support to the comprehensive educational approach of the DPG methodology (Martínez-Valdivia et al., 2021) and its strong adaptation to the SDG and the 2030 Agenda in teacher training (Dieste et al., 2019; Monsalve et al., 2021), through the promotion of educational inclusion, sustainability, and quality education for all (Escámez & López, 2019; United Nations, 2015).

In conclusion, these findings support the consideration of DPG as a successful activity (García et al., 2016) and, furthermore, support the adaptation of the methodology for sustainability curricula, being especially necessary in Education degrees (Escámez & López, 2019; Fernández et al., 2015; Olmos et al., 2019; Pegalajar et al., 2022; Triviño et al., 2021). DPG constitutes a methodology that is relevant to the principles and goals of Education for Sustainable Development (Martínez-Valdivia et al., 2021; 2022;

Vargas & Aragón, 2021) and is also a useful tool for offering an effective methodological response in line with the social responsibilities and commitments of the current university teaching staff (Martínez-Valdivia et al., 2020). The above should support the acquisition of resources in aid of teachers' efforts to address the SDG in their classrooms (Poza et al., 2022).

As recommendations derived from this work, we propose the promotion of dialogic practices in higher education classrooms as key tools for sustainable development, inclusion, and social transformation. Of particular interest is the implementation of this methodology in Education degrees, given that future teachers are potential agents of change and social improvement, who can lend continuity to these approaches in the classroom and among the future generations.

The main limitation of this study lies in its scope of application: it is focused only on Education degree students at the University of Jaén, which makes it difficult to generalize the results obtained. In addition, the use of the questionnaire as an instrument for the collection of information can generate problems of social desirability among those surveyed. On this basis, and as a future line of research, we propose that the sample could be expanded to a national scale, so that the findings of this study and the correlations found can be contrasted with results obtained in other higher education contexts. It is proposed, in turn, that the research could be enriched by incorporating experiential narratives provided by participants and teachers involved in the methodology. Such a hybrid approach might give greater depth to the evaluation of the impact of the dialogic pedagogical gatherings in the process of initial teacher training, through the adoption of a triangulated vision.

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## About the authors

**Estefanía Martínez-Valdivia**, Professor in the Didactics and School Organization Area of the Department of Pedagogy at the University of Jaén (Spain). Degree in Pedagogy, Master in Research and Innovation in Curriculum and Training. PhD with international mention, from the University of Granada. Member of the research group School Centered Education (FORCE) and member of two research networks: Leadership and Educational Improvement (RILME, a 'network of excellence' in scientific and technical research) and Iberoamerican Network for the Development of the Professional Teaching Identity (RIDIPD). I have participated in various national and international research projects focused on educational leadership research, school improvement and teacher training.

**M. Carmen Pegalajar-Palomino**, Professor in the Didactics and School Organization area of the Department of Pedagogy at the University of Jaén (Spain). PhD from the University of Jaén. Diploma in Teaching, specializing in Primary Education. Degree in Psychopedagogy. Master in Special Education. Member of the research group Development and Research of Education in Andalusia (DIEA) and the Ibero-American Network for the Development of the Professional Teaching Identity (RIDIPD). Recent research work focuses on inclusive education, teaching innovation, quality improvement in higher education, and social responsibility.

**Diana Amber Montes**, Professor in the Theory and History of Education Area of the Department of Pedagogy at the University of Jaén (Spain). Degree in Psychopedagogy, Master in Research and Innovation in Curriculum and Training. PhD with international mention, from the University of Granada. Member of the research group School Centered Education (FORCE) and of the Ibero-American Network for the Development of the Professional Teaching Identity (RIDIPD). Principal lines of research include higher education, teacher training, and adult education.

## ORCID

Estefanía Martínez-Valdivia  <http://orcid.org/0000-0001-7088-206X>

M. Carmen Pegalajar-Palomino  <http://orcid.org/0000-0002-2795-7502>

Diana Amber-Montes  <http://orcid.org/0000-0002-9765-3547>

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