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Simplexity As A Possible Operational Guide For The *Non-Linear* Organization Of A Playful-Musical Laboratory: Results Of An Experimental Research

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Abstract: The paper aims to show the results of an experimental research conducted with a sample of 353 students attending specialization courses for support activities for students with disabilities at the University of Salerno**.** Specifically, the workshop tried to operate on the exercise of rules and properties of simplexity to deconstruct linear teaching in favor of a *non-linear* approach, while also favoring the development of creativity and enhancing divergent thinking. To verify the actual effectiveness of the didactic action, a questionnaire consisting of 32 items, both incoming and outgoing, was administered and the appropriate correlations between data were verified. The results show that the intervention in a simple key has favored a change in the way of seeing teaching, favoring the deviation in the action concerning linearity.

Keywords: simplexity; playful-musical workshop; non-linearity; music; creativity.

1. Introduction[1]

Musical language, as an expressive form of communication, is configured as a useful means to foster educational processes (Culp & Salvador, 2021), thanks to the possibility of interweaving multiple dimensions, including the symbolic and articulatory (Zeng et al., 2021), as well as redefining operational trajectories according to non-linear approaches, therefore able to overcome traditional operating methods that are often unsuitable for young learners in the making (Sibilio & Zollo, 2022). The non-linearity of the action, proposed following a type of operational path of a simple character by Berthoz (2011), presupposes the inclination of the teacher to experiment with new forms of mediation of knowledge, capable of fostering the personal and interpersonal growth of students through originality, originality, and the creative deviation of new worlds (Berthoz, 2015). In teaching, this process, taking into account sound mediation, implies that in the different phases of teaching, educators are prepared to concretely experiment with these modes of action, especially where direct

[1] The work is a scientific collaboration of the authors. However, the attribution is as follows: Alessio Di Paolo is author of the full paper; Maurizio Sibilio is scientific coordinator of the work.

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experience in the field is lacking (Sibilio, 2015). This implies that already those who deliver educational courses value, during the phases of the activities, moments dedicated to debate, to active communication, while others instead to how active music, that is, that which is concretely experienced through body percussion or the aid of sound, percussion instruments, can nevertheless be useful for the mediation of knowledge, thus not resorting only to the mediation of the frontal interclad by further moments of active learning, to understand how these can subsequently be presented in the classroom to their future educands. Starting from this assumption, the paper presents the results of experimental research conducted in the context of specialization courses for support activities for students with disabilities at the University of Salerno. During the workshop, participants were offered various activities focused on music, on the application of music in an inter- and trans-disciplinary sense, and also coherently with the practical application of the rules and properties of simplexity. To verify the actual change in the way of perceiving the importance of music, the participants filled in a questionnaire ex ante and ex post, set up through a series of items recalling the rules and properties of simplexity to include in the final analysis the actual change as a result of the non-linear experience conduct. The activities included moments of dialogue, silence, and listening, to make the participants exhibit on all the possible declinations of sound.

Sound, in this sense, has taken on a dialogic and narrative potential, as well as didactic, improving feedback between teacher and student, as well as promoting awareness of an educational approach focused on deviation from the traditional, linear modus operandi. The experimentation of musical language, in all its possible forms, has made it possible, as a demiurge, tore-shape contents, and methods, based on the needs emerging during the training process and embodied in the expressive potential of sound, in the logical-semantic capacity given by dialogue, which laterally enhances skills traceable in listening, in the active and transformative potential implicit in it. In this perspective, the narrative and communicative language, declined in the different forms of listening, of speaking, has allowed an increase in human relationships, and interactions, promoting a process of growth for everyone, according to the suggestions already deriving from the Salamanca Conference (1994). The paper, therefore, is divided into three sections: in the first, the educational and inclusive potential of the music laboratory will be presented; in the second paragraph, on the other hand, attention will be paid to the theme of non-linearity as a modus operandi of creativity; In the last section, the results of the research conducted will be presented.

2. The educational and inclusive potential of the music laboratory

The artistic-musical laboratory offers a rich ground for educational development, as it integrates learning through creative expression and sensory experience (Chiappetta Cajola & Rizzo, 2019). Through activities such as painting, sculpture, music, and dance, participants can freely explore their emotions, develop their creativity, and gain greater awareness of themselves and others (Sevdalis & Keller, 2014). This multidisciplinary approach also stimulates collaboration and teamwork, encouraging learners to communicate and share their ideas in an inclusive and non-judgmental environment (Iowerth & Knox, 2022). In addition, the artistic-musical workshop fosters the development of cognitive, motor, and language skills, offering a complete educational experience that goes beyond the traditional frontiers of education (Pushkar et al., 2022), as artistic expression allows participants

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to explore and understand the world around them in a specific and personal way, enriching their knowledge and promoting a deeper and more inclusive view of reality.

Furthermore, the artistic-musical laboratory presents itself as an emblematic environment, representing not only a physical space but also a flexible locus, designed to encourage creativity. Operating, therefore, in such an environment, allows us to move away from rigid and stereotyped teaching, promoting instead a flexible and inclusive, non-linear approach (Aiello, 2015). Through the exploration of different art forms and interaction with music, students have the opportunity to enhance their cognitive and linguistic skills, as well as to develop a sense of greater interest in the different disciplines proposed and dialoguing, in an interdisciplinary sense, with music. In particular, the playful-musical workshop offers a suitable environment for experimenting with dialogue (Holmgren, 2022), enhancing individual diversity, and fostering collective and inclusive learning, in compliance with a training action that is aimed at everyone. Music, an interdisciplinary medium, is aimed at every student regardless of their abilities, promoting their value as an individual and a member of the community, a highly inclusive trait. The presence of music in the educational context indicates inclusive practices that promote respect, solidarity, and non-violence (Robertson, 2015). The integration of music and play, a happy oasis (Fink, 2008), in the workshop offers an authentic learning experience, facilitating the active participation of students and contributing to the construction of their identity and sense of belonging; In addition, the didactics of conduits (Delalande, 1987), based on musical play, is useful to improve the exploratory, expressive and organizational development of students, further enriching the educational experience.

In this sense, the music laboratory represents an ideal context for experiential learning, in line with several theories (VanWeelden, & Whipple, 2007; Powell, 2011; Silvia et al., 2015; Lodi, 2022) that emphasize the importance of direct experience in the acquisition of knowledge and skills. The various studies agree that the provision of an setting in which sound acts as a common thread in the design implies how students not only listen to or study music but actively experience it, participating in sensory and creative experiences that involve mind, body, and emotions (Thompson & Quinto, 2011). Through hands-on exploration of musical instruments, improvisation, and the creation of original pieces, students have the opportunity to straight experience the fundamental rules of music theory and to develop a deeper, more intuitive understanding of music itself. This approach to learning not only fosters a more meaningful involvement of students but also prepares them for cognitive transfert (Bigand & Tillmann, 2022) in real, applied contexts, according to a type of authentic approach (Herrington et al., 2014). Start of Module

The Music laboratory, consequently, is fertile ground for the application of the different intelligences that characterize the learners and not only the purely musical ones through sound learning and practice, thanks to which they can develop and enhance a diversified range of intellectual and artistic skills (Gardner, 2005).

Interesting, in this regard, is the link between sound and the theories of play proposed by Piaget (1967) and Vygotsky (1967), for whom play is an activity intrinsically linked to learning and cognitive development. Through play, students can freely explore, experiment with new ideas, and gain skills in a context that flexibly adapts to their peculiarities. In the music laboratory, so, students are invited to play with sounds, rhythms, and melodies, explore different combinations, and improvise freely. Additionally, the music game promotes social interaction and collaboration,

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encouraging students to communicate, share, and cooperate with their peers. It is also relevant to the thought of Huizinga (2008) who, in outlining his theory about homo ludens, highlighted the central role of play in human culture and social behavior. Huizinga considered play not only as a playful activity but as a fundamental component of human life that impacts to the formation of society and their values. Music, already useful in itself for the growth of the individual, is flexibly interconnected to the game to further stimulate the person to recognize himself as belonging to a context (Luzano-Murciego et al., 2021), to a given culture or territory.

All these aspects are further interconnected and allow us to outline a description of the laboratory as a sound space of inclusion. In the context of the music workshop, inclusion translates into the creation of a welcoming and respectful environment, where students can fully participate and contribute significantly, respecting their peculiarities, to the various activities proposed, spaces of full vicarious expression through sounds that represent a means of work and an expressive end of the self.

In summary, the music workshop contributes to creating a more equitable, respectful educational environment that values diversity, promoting the success of all students, according to a non-linear approach and that allows the teacher, in any case, through the unusual (Callimachus, trans. 1996) to reach new horizons of meaning through the expansion of his cognitive domains in the harmonious interweaving with diversity. Musica language in the music laboratory is a useful medium to favor the interpretation and coping with educational complexities, using different but equally effective forms of educational mediation, also beneficial for the development and enhancement of creativity.

3. Non-linearity as *creative modus* in complexity

Musical language, as it encourages the performance of activities that follow creative work trajectories, is capable of thus encouraging the exploration in teaching of new modes of action, even different from those traditionally used in the classroom. Of course, sound, as already mentioned, should not be understood in the dimension of the melodic alone, but in all its possible facets including the communicative, the dialogic, modes are also useful for teachers to identify, and address the educational complexities emerging during the different processes of didactic interaction between learners, as well as between teacher-teacher. In recent years, the complexity of teaching and learning has become a central element in Italian educational contexts, reflecting further social, political, economic, and cultural changes, as well as the development of educational technologies and new approaches to learning, including the concepts of diversity and difference (Aiello, 2018).

In response to this complexity, the educational intervention aims to overcome forms of transmission rigidity, typical of linear teaching, in favor of more dynamic and articulated job prospects, which promote creativity not only in those who mediate learning but also in those who learn (Zollo et al., 2015). It is no coincidence that Goleman, in defining the concept of emotional intelligence, finds in the creative process a useful way to enhance the possible connection between the rational and the sentimental mind (Goleman, 2011), apparently preponderant, uncontrollable. Yet, the action that generates new ideas is able, in turn, to mark trajectories of domination to what is not, thus favoring the emergence of reflective, self-regulating processes, typical of rationality in the chaotic dynamism of the creative. Prigogine himself (2003), in outlining his theory of chaos, argues that order can always be found in apparently

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unmanageable processes. This mechanic is also applicable in school contexts, starting from teacher training (Aiello, 2012), where it is interesting to encourage the acquisition of skills capable of deconstructing the linear in favor of spontaneity, and creativity, still able to restore a sense of balance.

The goal of this process, then transposed into classroom teaching by those same teachers who have been trained, is therefore to create an effective interaction between teachers and students and between students themselves (Sibilio, 2020). The teacher's action should adapt to the needs and actions of the students, creating a reciprocal circularity that finds expression in the didactic agreement (Frauenfelder, 2000). The destructuring and creative action of an innovative non-linearity traces in the overcoming of linearity the first step for the start of an adaptive process, based on a new form of complexity, accessory (Sibilio, 2014), through which to decipher, face, and overcome complexities in the originality of the action. Different forms of linearity can influence educational practice, including linearity in the theory-practice relationship, through which the teacher is convinced that either theory or practice is dominant in the teaching process, leaving out the need for a circular relationship between the two; egocentric linearity, which implies an action for which the teacher is unable to change his or her pattern of action in an attempt to generate minds that are similar to his or her own; linearity in the patterns of action and linearity in the perception of teaching outcomes, which implies that the teacher does not change the patterns of his or her actions, especially in front of students considered a priori capable or incapable of achieving certain objectives. Therefore, investing in initial teacher training that helps to break out of the perceptual bubble of similarity and equality in action is essential to address the complexity of teaching and learning more effectively and creatively.

Precisely in this regard, the neurophysiologist of perception, Berthoz (2011), in an attempt to search for a possible connection between complexity and simplicity through the theory of simplexity, emphasizes creative, inhibitory, and vicarious action as a biological necessity for the survival of living beings on earth. Human beings, in fact, from animals to plants, act by their nature in a creative sense, in an attempt to find, in front of the problem, the structural components in an attempt to overcome it by overcoming all the constituent sub-problems, according to an approach for which, in the end, almost ecstatically, the whole returns in any case a solution that is greater than the sum of the individual parts.

This process in an educational and inclusive sense implies first adopting a non-linear teaching action, which cultivates creativity and divergent thinking to shape an environment accessible to all students. This deviation involves the use of additional complexity that simplifies the teaching-learning process and offers alternative paths to established models (Sibilio, 2021). It is necessary, therefore, to deconstruct these models which, although effective in part, cannot exhaustively solve the educational complexity.

The accessory complexity, which is based on reticularity and interhistoricity, implies the use of new forms of mediation, of which sound is a possible trajectory, and which are useful in any case to make knowledge assume a form of transposition (Chevallard, 1989) in constant construction and deconstruction. Of course, the flexibility of music is such when all the fundamental constituents of it are taken, including listening and speaking, even according to a narrative approach (Demetrio, 2012).

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In teaching practice, therefore, and during the different phases of teachers education itself, this modus favors the search for more ways and creative solutions to deal with complex situations, avoiding rigidity and opening new perspectives (Aiello et al., 2016). Creativity, already in itself a natural process of the human brain, no longer limited to a few individuals, finds in sound new paths of action, useful for reinforcing the skills of teachers, as well as supporting them in deviating from stereotyped actions, offering new and original job prospects. Teachers should be able to change these perspectives precisely to address the complexity of educational contexts and ensure the success of all students, according to an inclusive approach. In order, therefore, to train new generations of teachers able to deal with change and complexity and able, in turn, to implement a similar action with their learners, supporting and amplifying deviations, while working on the unexplored and anticipating future scenarios. It is necessary to move from a truthful decision-making approach, which seeks only one correct answer, to an adaptive decision-making approach, which considers a wide range of variables and implies adaptive decisions, fully corresponding to the properties and rules outlined by Berthoz and according to a more inclusive teaching approach.

4. Description of the search experience

To identify an effective training model, applicable in school contexts, the laboratory during which the analyses and research were conducted was focused on the concrete application of the rules and properties of simplexity, with the aim also of promoting the exercise of non-linearity in teaching through the use of the properties and rules themselves. To understand the change in the way teachers act and whether, indeed, during the laboratory activities, through the presentation of non-linear activities, a change was also produced in the way of perceiving simplexity as a possible application paradigm in classroom activities, it was important to have a valid measurement tool; for this purpose, a questionnaire was developed, based on the one already validated by Zollo et al. (2019), and adapted to the specific topics covered by the course, i.e. the arts and, in particular, music, without forgetting the reference to the rules and properties of simplexity[2]:

- *separation of functions and modularity;*
- *flexibility;*
- *probabilistic anticipation;*

[2] According to the theory of siplexity, proposed by theorist Alain Berthoz (2011), all living things always find quick and effective ways to be able to cope with situations of complexity, resorting to the use of features and rules of operation, declining in rules and properties. This makes them easily adaptable to change and able to find, from time to time, new solutions, taking into account experience and anticipating the future. In didactics, such a model requires the teacher to be able to constantly redesign his or her action because of the constant changes occurring in the educational system, as well as in the very students he or she deals with, in an unpredictable system in which the emerging characteristics of context appear to be strongly conditioned by the present and past history of the very system to which they belong (Sibilio, 2023). The novelty derived from the analysis conducted by the scholar, corroborated by scientific evidence related to the neurophysiological studies he conducted, was to consider man as capable, through perception, of making choices by eliminating all possible ambiguity, linking past and present and creating order between the subject himself and the world.

- *memory;*
- *inhibition and rejection;*
- *selection and specialization;*
- *cooperation and redundancy;*
- *sense.*

As can be seen from the list above, the sub-dimensions of simplexity do not exactly coincide with the rules and properties, as some rules and properties have been measured using only one item, therefore it is not possible to consider them as sub-dimensions, but as simple indicators.

The research was carried out at the University of Salerno as part of the specialization course for support activities for students with disabilities, to investigate to what extent simplexity in teaching, through training activities aimed at exercising its properties and rules, can prove to be relevant for teachers in training, encouraging the experimentation of methods of action that allow to deconstruct the linearity of teaching through a sound-mediated laboratory approach.

The course ran from March 2023 to May 2023 and lasted 20 hours divided as follows:

- 5 hours dedicated to the explanation of Alain Berthoz's theory of simplexity and its possible application in teaching and workshops, with a particular focus on music and art as means of "non-linearity";
- 15 hours intended for the planning of didactic activities starting from the properties and rules of simplexity to deconstruct the didactic linearity of teachers in training and to identify different teaching methods from those used in their routine, placed about the arts and music.

4.1. Participants and procedure

The sample used for the study is made up of 353 teachers working in schools of all levels who participated in the specialization course for support activities for students with disabilities at the University of Salerno during the activities provided as part of the VII cycle courses. Teachers were asked to fill out a face-to-face questionnaire at two-time points, one at the beginning of the course (Phase I – March 2023) and one at the end (Phase II) (about two months later – May 2023). The questionnaires were completed anonymously by the teachers; The questionnaires completed in the first phase were paired with those of the second phase using an identification number or code chosen directly by the participants.

4.2. Instruments

The questionnaire used was created with the use of Google Forms. It consists of 32 items, 29 of which have been developed based on the properties and rules of simplexity declined in the artistic-didactic field, while the other 3 items are descriptive of characteristics of the didactic action not provided for by the model of simplexity. These items were added for control purposes.

Concerning the 32 items, the trainees were asked to reflect on their perceptions regarding:

- the relevance of specific didactic actions (first part);
- their ability to carry out these didactic actions about the arts and, specifically, music (second part);
- to what extent the training course has changed the idea about the relevance of specific didactic actions about the arts and, specifically, to music (third part)? The items of the questionnaire are distributed as follows, also based on the rules and properties to be considered for the research (See appendix);
- the fourth part of the questionnaire was dedicated to the socio-demographic characteristics of the participants. The study presented here considers only some items of the questionnaire, particularly those that refer to the measurement of the rules and properties of simplexity, and which have been listed above.

The first part of the questionnaire was administered at the entrance (before the laboratory activities), while the second and third at the end of the workshop. The present study focused on the third part of the questionnaire relating to their opinions concerning the extent to which the laboratory had changed the relevance of their didactic action.

4.3. Data analysis

To assess the internal consistency of each dimension of the scale, an analysis of the averages of the collected data was conducted. For each item, the percentage of choice of each score on the Likert scale was calculated. Therefore, for each of the items and each of the scores chosen by the participants, it was possible to detect the percentage of agreement. This operation was carried out with both input and output data, to verify the variability of the choices and, if so, to highlight whether there had been a change in the way the participants perceived the teaching approach. To further confirm the validity of the analysis conducted, t-tests were carried out for each score chosen, to verify if there had been a significant change in opinions and, therefore, if indeed the proposed activities had in some way led to reflect on the deconstruction of linear activities in favor of a non-linear approach, mediated by music.

4.4. Results

4.4.1. Socio-demographic characteristics of the teachers participating in the study

The participants, as already highlighted, were 353, filling in the questionnaire both incoming and outgoing and correctly, thus answering all the questions presented. The sample is composed almost entirely of female teachers (82%) compared to male participants (18%). Participants ranged in age from 26 to over 60 years, and the most frequent age range was 31 to 35 years, as shown in Table 1.

Table 1. Socio-demographic characteristics of the teachers participating in the research

Age	**Frequency**	**Percentage Frequency**
Up to 25 years	10	2,8
26-30 years	58	16,4

31-35 years old	84	24
36-40 years	67	19
41-45 years old	78	22
46-50 years	27	7,6
51-55 years old	26	7,3
56-60 years	2	0,5
More than 60 years	1	0,4
Total	353	100.0

4.4.2. Teachers' qualifications

As shown in Table 2, the professors who participated in the research have different qualifications; Most of them also hold postgraduate master's degrees, in particular specialization courses (48.4%). It should also be noted that many teachers have obtained the old system degree (27.7%), so few have stopped at the achievement of the master's degree (0.8%). A small percentage also obtained a doctorate (1.7%).

Table 2. Teachers'qualifications

Educational Qualification	**Frequency**	**Percentage Frequency**
Diploma	18	5,1
Bachelor's degree	5	1,4
First-level Master's Degree	15	4,2
Bachelor's degree	105	27,7
Specialization course	171	48,4
Second-level Master's Degree	17	5,0
Qualification	13	3,7
Master	3	0,8

Ph.D.	6	1,7
Total	353	100.0

About the size of previous experience in the curricular field, it should be noted that most of the participants answered negatively to the question posed, as shown in Table 3.

Table 3. Previous experience as a curriculum teacher of research participants

Previous experience as a curriculum teacher	**Frequency**	**Percentage**
Yes	151	42,8
No	202	57,2
Total	353	100.0

Despite their previous experience, the participants, in terms of teaching, are mostly young, as they have a teaching experience that, for most of them, does not exceed five years (89.4%) (Table 4).

Table 4. Previous experience as a curriculum teacher in years of research participants

Previous experience as a curriculum teacher in years	**Frequency**	**Percentage**
From 0 to 5 years	135	89,4
5 to 10 years	9	5,9
10 to 15 years	5	3,3
Over 15 years	2	1,4
Total	151	100.0

As far as grade is concerned, the majority have previous experience in the Upper Secondary level (82%) (Table 5).

Table 5. Previous experience as a teacher and grade of research participants

Previous experience as a teacher grade	**Frequency**	**Percentage**
Childhood	2	1,3
Primary	10	6,7
Lower Secondary	15	10,0

School		
Upper Secondary School	124	82,0
Total	151	100.0

A situation similar to previous curricular teaching can be found for support (Table 6). The majority of participants said they had no previous experience with support (69%).

Table 6. Previous experience as special education teacher of research participants

Previous experience as a special education teacher	**Frequency**	**Percentage**
Yes	111	31,0
No	242	69,0
Total	353	100.0

As regards the number of years of teaching (Table 7), 99% of respondents stated that they had previous experience in the field of support (99%).

Table 7. Previous experience as special education teacher of research participants

Previous experience as a special education teacher in years	**Frequency**	**Percentage**
From 0 to 5 years	110	99,0
5 to 10 years	1	1,0
Total	151	100.0

Teaching on support concerned the upper secondary level (82.9%) (Table 8).

Table 8. Previous experience as special education teacher of research participants

Previous experience as a special education teacher/grade	**Frequency**	**Percentage**
Childhood	2	1,8
Primary	10	9,0
Lower Secondary	7	6,3

School		
Upper Secondary School	92	82,9
Total	151	100.0

4.4.3. Percentages related to the measurement scales used in the research

As far as the percentage analysis is concerned, it should be noted that there was a significant change between the preferences, expressed in and out by the participants. A large part of the outgoing preferences were concentrated in particular in the choice of indicators 4 and 5. The improvement line has been distributed, in general, for all items. However, there have been significant changes in opinion, especially about the use of music to encourage rapid responses in students in case of complex situations, as well as the use of the music mediator to produce reliable activities, therefore respectful of the objectives set. Also interesting is the greater choice towards flexibility and adaptation to change, which requires the use of the artistic-musical medium to adapt strategies and didactic actions in situations similar to the previous ones. Finally, there is a predominant change in the dimension of meaning, i.e. the one that provides for the attribution of value to the actions of the teacher, thanks above all to the use of the arts and music (Table 9). It would seem, therefore, that the exercise of simplexity applied to laboratory activities has led to a change in the way of conceiving teaching from a non-linear perspective. The teachers, already sensitized to the didactic-inclusive potential of simplexity in music, had the opportunity to see first-hand, through educational activities designed based on the properties and rules of simplexity, to verify how it is possible to concretely apply the same properties and rules to encourage innovative teaching proposals that respect the peculiarities of the students, their personal cognitive and learning styles.

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Table 9. Summary percentage data for each item/grade on the Likert scale, collected according to the rules and properties

Properties/ rules	ITEM	%Input 1	%Output 1	%Input 2	%Output 2	%Input 3	%Output 3	%Input 4	%Output 4	%Input 5	%Output 5
Separation of functions and modularity	1	2	0	10	2	26	15	50	56	12	27
	2	1	0	11	3	31	17	45	52	12	28
	3	0	0	10	3	34	19	46	50	10	28
Speed	1	1	0	5	1	26	19	48	50	20	30
	2	0	0	3	1	22	12	53	47	22	40
	3	1	0	3	2	18	12	51	43	27	43
Reliability	1	2	0	6	19	30	15	48	44	14	22
	2	1	0	4	2	23	13	51	47	21	38
	3	1	0	8	4	25	19	39	47	27	30
	4	2	0	4	1	23	12	44	47	27	40
Flexibility and adaptation to change	1	1	0	2	1	16	12	49	42	32	45
	2	0	0	7	1	24	12	50	52	19	35
	3	1	0	4	2	20	9	57	50	18	39
Memory	1	1	0	4	1	24	15	46	42	25	42
	2	0	0	3	2	21	14	46	46	30	38
	3	1	0	2	2	23	11	55	51	19	36
Generalization	1	0	0	2	1	16	11	54	51	28	37
Inhibition and refuse	1	3	1	7	1	24	12	45	44	21	42
	1	1	0	2	1	17	13	54	47	26	39
Specialization and selection	1	1	0	2	1	15	11	49	45	33	43
Probabilistic anticipation	1	1	0	2	1	25	16	50	47	22	36
	1	1	1	6	1	20	11	52	47	21	40
	2	1	0	7	2	26	16	50	48	16	34
Detour	1	1	0	4	2	21	15	46	49	28	34
Cooperation and redundancy	1	1	0	2	1	16	9	47	43	34	47
	2	0	0	1	2	14	8	45	43	40	47
	3	1	0	1	1	12	9	50	46	36	44
	4	0	0	2	2	20	11	50	45	28	42
Sense	1	1	0	4	1	17	12	52	47	26	40
	2	1	0	4	1	16	11	49	48	30	40
	3	0	0	2	1	18	9	56	50	24	40
	4	0	0	4	1	20	12	52	47	24	40

4.4.4. T-test analysis

To further verify the efficacy and reliability of the data collected, a t-test was carried out that correlated the input and output data for each individual attributable score, to verify the actual variation in the participants' choices. The results (Table 10) confirmed the actual change and improvement in the choices, with a radical reduction in low scores and an increase in high scores, concerning all characteristic items.

Table 10. T-test analysis results

Likert Scale Index	T-Test
1	5.15E-08
2	0,001697
3	2:3E-15
4	0,011069
5	2.91E-17

It is possible, therefore, to confirm that the general trend of teachers is positive and that therefore there has been an increase in the way of conceiving simplexity as a possible guide for the structuring of non-linear teaching activities and able to favor, in any case, respect for the peculiarities of the student by tracing actions that are original, unusual but which, in any case, allow the achievement of the pre-established educational objectives.

5. Conclusions

The present study aimed to evaluate the change in teachers' perception of simplexity following attendance at a music workshop entirely focused on the application of properties and rules of simplexity. The averages and the results of the t-test show that the application has indeed caused a change and, therefore, produced an improvement in the way of thinking about the paradigm as a possible guide for the structuring of inclusive educational activities. These results are in line with previous studies, which have shown that the tool used as a basis for data collection is valid to measure the construct of simplexity. Subsequent studies could use this tool to assess the presence of any differences concerning some variables examined by the scientific literature, such as gender, type of teaching, the level of school in which it is taught, and the personal and professional experience of teachers and which could, therefore, provide further trajectories for the structuring of classroom work with students, in particular with Special Educational Needs. The analysis conducted showed, in an inclusive sense that the experience of participating in a music workshop focused on understanding and applying the principles of simplexity, in particular the idea of non-linearity, positively influenced teachers' perceptions regarding the structuring of teaching activities. This suggests that music, as a form of art and creative expression, possesses an inherent ability to influence educational thinking and practice in non-linear ways, allowing activities to be adapted flexibly to all students and their cognitive styles, according to inclusive regula.

Music, furthermore, does not merely provide a means to convey concepts and knowledge linearly but acts as a catalyst to stimulate creativity, critical reflection, and transformative thinking. Through engagement with music, teachers may be led to consider new perspectives on structuring teaching activities, encouraging more inclusive approaches that are adaptable to the diverse needs of students.

In addition, the idea of using music as a vehicle to promote simplicity and inclusiveness in education is particularly relevant to working with students with Special Educational Needs. Music provides fertile ground for individual expression and active participation, allowing teachers to adapt their teaching practices to meet the specific learning needs of each student. We also reserve the right to conduct further studies to further confirm the first data collected and, therefore, to try to search for new ways to guide teachers through further modes of action in a simple way and focused on the use of the arts and music, to make the teaching process even more inclusive, respecting the peculiarities and specific cognitive styles of the learners.

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Appendix: Items prepared based on the rules and properties of simplexity

Properties/Rules Reference	**ITEM**
Separation of functions and modularity	1) Using the music channel separately, but intentionally, to achieve the same goal
	2) Use different modes of didactic action separately, specifically circumscribing the artistic-musical ones in a specific space
	3) Use different modes of didactic action separately, specifically circumscribing the musical ones in a defined time
Rapidity	1) Use music to act quickly on negative feedback from students
	2) To make the necessary changes in didactic action, using music and graphic-pictorial arts, to achieve the set objectives
	3) Modify the objectives during the work, using artistic and musical activities, to adapt them to the changing teaching circumstances
Reliability	1) Use didactic modes of action focused on the arts and music and evaluated through scientific evidence of efficacy
	2) Carry out didactic actions that remain faithful to the intentions that motivated them even with the use of graphic-pictorial and musical arts
	3) Gather in advance the consensus of colleagues on the educational objectives to be pursued from a transdisciplinary per-

	spective
	4) Pay attention to the fact that one's expectations and prejudices, especially towards the application of the arts and music, do not influence the didactic action
Flexibility and adaptation to change	1) Constantly model the didactic action to the needs of the learner and the context, also resorting to the graphic-pictorial and musical arts if necessary
	2) Codify the didactic action in art and music in schemes that can be used in similar situations
	3) Use patterns of didactic interaction through music and the arts in different situations in which similar educational needs emerge
Memory	1) Capitalize on previous teaching experiences related to one's musical action
	2) Capitalize on the previous didactic experiences related to the learners and the context, their inclinations towards artistic-musical activities as an expression of the self
	3) Use previous experiences concerning the use of the arts and music, as well as the elements of the context, to anticipate the results of the didactic action
Generalization	1) Acting with the graphic-pictorial and musical arts, while maintaining didactic continuity
Inhibition and the principle of rejection	1) Inhibit one's traditional didactic action, resorting to the arts and music, to avoid carrying out actions that are inappropriate to the needs of the learner
	2) Regulate one's didactic action, also through the use of the arts and music if necessary, inhibiting actions that are inappropriate to the context
Specialization and selection	1) Select teaching strategies that fit the student's "world", especially if they focus on the arts and music

Probabilistic anticipation	1) Plan in detail the didactic activity through the involvement of artistic-musical activities, to be in a position to manage the events
	2) Adopt specialized educational solutions, based on the arts and music, able to respond in advance to the needs of students
	3) Predict the possible outcomes of the didactic action through musical and artistic exercise
Detour	1) Systematically use multimedia technologies to support learning, intertwining them with graphic-pictorial and musical activities
Cooperation and redundancy	1) Have a plurality of useful solutions to facilitate the teaching-learning process, including arts and music
	2) Use different teaching strategies, including arts and music, due to the different cognitive and learning styles of learners
	3) Act didactically by ensuring the cooperation of all the resources at your disposal, including artistic and musical ones
	4) Acting didactically by harmoniously using all the resources at one's disposal, including artistic and musical ones, reducing any interference
Sense	1) To maintain that the use of graphic-pictorial and musical arts allows the spontaneous maturation of learning processes
	2) Use peer interaction, fostered through the arts and music, as the main mediator of the teaching-learning process
	3) Giving meaning to the instructional interaction fostered through the arts and music
	4) Consistently attribute meaning to learners' actions and the function of objects, spaces, and context involved in arts and music-focused activities