

ANALYSIS OF THE EFFECTS OF SOLIDARY LEARNING IN PHYSICAL EDUCATION CLASSES



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ABSTRACT

This article analyzes the effects of Solidary Learning on learning and interpersonal relationships in Physical Education classes, highlighting its importance in the integral formation of students. The active methodology promotes a collaborative environment, allowing students to become protagonists of their learning and develop social and emotional skills. The research was carried out at the Professor Gabriel Almeida Café State High School, in Macapá, Amapá, Brazil, and involved 31 students from the New High School. A qualitative approach was used, with data collection techniques such as participant observation, interviews and analysis of lesson plans. The results showed that the interaction between students strengthened their interpersonal relationships and promoted the exchange of knowledge, in addition to encouraging autonomy and social responsibility. The creation of the Leisure Room served as a practical example of how the methodology can positively impact the school community. The students' testimonies revealed greater empathy and engagement in the activities, contributing to meaningful learning. The study concludes that active methodologies, such as Solidarity Learning, are essential to prepare students for the challenges of the 21st century, forming more critical

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and aware citizens. Continuity of research in this field is recommended to improve educational practices in different contexts.

Keywords: Solidary Learning. Autonomy. Physical education. Social Skills. Social Responsibility.

INTRODUCTION

Physical Education is a fundamental curricular component in the integral formation of students, contributing to social and emotional development. In recent years, the implementation of active methodologies, such as Solidarity Learning, has gained prominence, aiming to transform the school environment into a more collaborative and inclusive space. This practice contributes to students becoming protagonists of their learning process, encouraging the exchange of experiences and the development of essential interpersonal skills. Johnson and Johnson (1999) state that cooperative learning promotes greater understanding and retention of content, in addition to developing social and emotional skills.

In this context, Solidarity Learning stands out for its ability to foster collaboration among students, promoting an environment where knowledge is collectively built. By working in groups, students share information, learn to listen, respect and value the opinions of their colleagues, which is fundamental for the formation of critical and participatory citizens. Dewey (1938) emphasizes the importance of a learning environment that promotes interaction and practical experience for the development of critical thinking and deep understanding of content.

This article aims to analyze the effects perceived by students in Physical Education classes when they are exposed to the Solidarity Learning methodology. The research seeks to identify how this strategy influences not only the learning of specific content, but also aspects such as autonomy, social responsibility and the development of social and emotional skills. Freire (2014) argues that education should be a practice of freedom, and the social interaction promoted by this methodology can result in significant impacts on students' perception of their own abilities and the strengthening of interpersonal relationships.

Through interviews and observations, it is intended to understand the depth of the transformations that occur in this educational context, contributing to a broader understanding of the importance of the methodology in the integral formation of students. Therefore, by exploring the effects of Solidarity Learning in Physical Education classes, this study proposes to offer valuable insights to educators, managers and researchers, highlighting the relevance of innovative pedagogical practices that promote a more meaningful and transformative education. Ausubel (1982) highlights that meaningful learning occurs when new information is connected in a substantive and non-arbitrary way

to the student's pre-existing knowledge, reinforcing the importance of teaching that values experience and collaboration.

MATERIALS AND METHODS

This study is classified as an applied research, focused on the production of knowledge that aims to solve specific problems and meet local desires (Prodanov; Freitas, 2013). The research has explanatory characteristics, seeking to identify determining factors for observed phenomena, which allows a deepening of the knowledge of reality (Gil, 2008). In addition, it is characterized as Participant Research, where the interaction of the researcher with the participants is central. This approach promotes a close dialogue and observation of the relationships between the group and the phenomenon studied (Demo, 1984; Queiroz et al., 2007).

The selection of participants was random and by convenience, and the sample was defined from a class of the school's New High School. The selected class had 42 students, of whom 31 participated until the end of the research, respecting the criteria of consent and attendance. This definition was essential to ensure that the sample was representative and that all participants were properly informed about the study.

Data collection was carried out through the techniques of analysis of lesson plans, audio recordings, visual records and participant observation. The use of a field diary was also fundamental, allowing notes and reflections during the process. In addition, interviews were conducted with five students, who freely proposed to participate, to obtain deeper insights into the experience, contributing to a richer understanding of the effects of Solidarity Learning.

The research design followed four distinct phases of Participant Research: institutional assembly, preliminary study, identification of problems and programming of actions (Boterf *apud* Brandão, 1987). In the first phase, meetings were held with the school administration and the students to clarify the objectives and ethical aspects of the study. The second phase consisted of dynamics to get to know the students and integrate them, creating an environment conducive to research. The third phase focused on the demands of the school community, encouraging students to reflect on their needs and concerns. Finally, the fourth phase involved the execution of the Leisure Room project, which was an important milestone in the research.

The research was carried out at the Professor Gabriel Almeida Café State High School, located in Macapá, Amapá, Brazil. This school is one of the oldest in the state, serves a diverse population of students and has a significant infrastructure, which makes it an ideal environment for the implementation of the proposed educational methodology. The study population consisted of 1,368 students enrolled in the New High School, with the final sample consisting of 31 first-grade students, all of whom had just arrived at the school.

Finally, the research respected the ethical principles established by the National Health Council, ensuring integrity and respect throughout the process. Consent was obtained through Informed Consent Forms (ICF) and Informed Consent (TALE), ensuring that all participants were aware of their rights and the nature of the study.

The data analysis adopted in this study followed the content analysis methodology proposed by Bardin (1977). This method included stages of organization, coding, and categorization, allowing for a rigorous and systematic treatment of the data collected. Familiarity with the data facilitated the identification of relevant themes, which were grouped and analyzed in relation to the study objectives, contributing to a deep and systematic analysis and understanding of the effects of Solidary Learning in Physical Education classes on learning and interpersonal relationships.

RESULTS AND DISCUSSIONS

COLLABORATION AND TEAMWORK

Interpersonal relationships were of significant importance in learning among students, who worked together in groups to achieve common goals. In the midst of these interactions, the students shared knowledge, skills, ideas and perspectives, which enriched the learning process during the implementation of the methodology in Physical Education classes.

For C01:

Interesting is in the project we exchange information. There were things that my colleagues knew, that I didn't know, and that with this exchange I was able to learn, for example, about Craft if I want to achieve something I can talk to the director and get a craft and suddenly transform another environment. There are things that the discipline will not teach, but when we exchange our experience we learn more. It seems that things make sense, they are not isolated and they are not only seeing mathematics, only Portuguese everything is mixed, but there is a... it has a real function. That I'm going to take with me for my life.

The exchange of information highlighted by C01 was possible because the students worked together, as they shared ideas, experiences and perspectives, which enriched the learning process. In addition, the exchange of knowledge stimulated critical reflection and the joint construction of new knowledge, as demonstrated in Y02's statement:

Through the project we learned much more than traditional physical education such as court, volleyball. We learned much, much more like I talked about craft, that my colleagues didn't even know what it was, some colleagues didn't know, but we also talked about games, games, rules in sports, ethics in sports.. It was a lot, beyond the traditional.

These findings corroborate Johnson's studies; Johnson; Holubec (1999), who highlight that cooperative learning, where students work together in small groups to maximize their own learning and that of others, promotes greater understanding and retention of the content, in addition to developing social and emotional skills.

The strengthening of interpersonal relationships was an important point, because through the methodology there was a favorable welcoming learning environment, where students felt safe to share ideas, express opinions and learn from each other, as is clear in the statement of M04:

I always had difficulty communicating, and then I was there talking showing the price survey, and writing the project, everything I did led me to speak, but it was a natural thing, even in front of the whole class, it seemed like a conversation, it didn't seem like they were going to judge me as in a work from other disciplines.

Social and emotional skills were also favored, important both for academic success and for life in society. The students learned to communicate effectively, to listen to others, to resolve conflicts, to exercise empathy and to work collaboratively, as in the statement of A03 during the interview:

I think it improved my relationship with my colleagues, because I'm not a very sociable person and I think that part of getting involved with other people helped me a lot in my social part. I learned to relate and listen to people and talk to them and reveal some things too, right?! When they talk and we don't like it, now there's not much of a problem for me.

This statement highlights how involvement in activities that promote collaboration and the need for communication within the school environment can facilitate the development of interpersonal skills. In addition, A03 reports that she learned to listen, speak and reveal certain situations, indicating an evolution in her ability to deal with conflicts and divergent opinions, demonstrating emotional maturity.

This transformation is significant, as it demonstrates that the school, in addition to teaching academic knowledge, also develops a formation of the character and preparation of students for more complex social interactions in the future. In this sense, the experience described by A03 illustrates the importance of an educational environment that promotes socialization and empathy, as it contributes to the integral development of students.

Autonomy and shared responsibility were also evidenced during the activities and could be identified during the interview, as expressed in C01:

Because getting involved was something I didn't do before. I didn't like to take responsibility, I didn't take responsibility for things. I'm much more responsible today, because just because it's already in this project it's a very big responsibility, when I said the idea of the project I already felt the responsibility, now I have to go to the end, I thought like that. And I realized that things seem difficult, but by taking the first step things happen.

Thus, they had the opportunity to make joint decisions, to be actively involved in the organization of activities and to assume individual and collective responsibilities. This active participation promoted a sense of self-determination and responsibility for their own learning, which was perceived by the students.

Collaboration and teamwork in Physical Education allow students to build knowledge collectively, which promotes social learning (Ausubel, 1982). By interacting, discussing, and collaborating, they had the opportunity to develop cognitive, emotional, and social skills, as well as to mutually benefit from different points of view and experiences, which fostered an enriching and meaningful learning environment.

PARTICIPATION AND ENGAGEMENT

The participation and engagement were perceived by the students throughout the process. Both in the PE classes and in the interviews, they shared how Solidarity Learning encouraged them to be actively involved in the activities, and in addition, they demonstrated positive feelings that possibly helped them to have greater interest and motivation for learning and interpersonal relationships.

In the interview, I01 makes the following comment about the perception of his participation and relationship with his colleagues:

My relationship with people improved a lot, I was always very shy and during the project I was able to talk to people, so, led to talk to people, I was always going to talk to be able to do things and that was very cool and fun, I learned a lot. My friendships have improved! Organizing, arranging things, everyone participated, we

got organized, we got even closer. Our relationship in the classroom was very funny, it was a lot of fun, I liked it a lot.

According to I01's comment, they were involved and interested in the activities that were being proposed, always in a pleasant environment that stimulated active participation and engagement in the activities, thus having more opportunities to retain information, understand concepts and apply knowledge in a meaningful way (Ausubel, 1982).

According to Dewey (1938), a learning environment that promotes interaction and practical experience is fundamental for the development of critical thinking and deep understanding of content. In this sense, students were having the opportunity to develop skills that the National Common Curricular Base (BNCC) highlights as essential for the new educational moment (Brasil, 2018).

During the interview, C01 commented on his emotional state:

I feel much happier than before, because it was a project that I talked about, but I didn't imagine that people would accept it, that I would speak and people would agree. And now the project there. So I feel very happy to have said something and it worked, that's really cool. And I learned a lot from the project, especially knowing that I have to speak and defend my idea.

During the interview, the students were able to make their analyses, talk about what they perceived during the implementation process, and reflect on what they felt and what they achieved with their involvement in Physical Education classes, and also had the opportunity to remember moments in which they experienced individual and collective successes.

According to Hattie (2009), metacognition, which is a process of self-analysis, gives students the possibility to reflect on their learning strategies and adjust their actions to improve performance. For Boud (1995), self-assessment and peer assessment promote collaborative learning, developing communication and collaboration skills among students.

Furthermore, Perrenoud (1999) emphasizes that evaluation practices are fundamental for the development of autonomy and responsibility, as it encourages students to critically reflect on their own performance and that of others, which leads to continuous improvement and the development of social and emotional skills.

Furthermore, Bandura, Freeman and Lightsey (1999) point out that self-efficacy, or the belief in one's own abilities to organize and perform the actions necessary to produce certain results, is a determining factor for motivation and academic success. In this sense,

the findings demonstrate that the activities were helping the students to perceive their abilities and this may have contributed to their engagement and learning.

The positive impact on learning and relationships was also reported when I01 responded to the interview evaluating her sense of social responsibility and her autonomy: "Now I know that it works, I can do things, I can talk to people to help. This activity also leads us to believe, to believe in myself, that we can transform places."

Thus, active participation in classes was seen as a stimulus to individual and collective responsibility, because during the process students were encouraged to take responsibility for their own learning, make decisions, plan and organize activities, which may have contributed to the development of autonomy and self-determination skills, in addition to stimulating the improvement of self-esteem.

Thus, through these reports, it is possible to observe how the participation and engagement in Physical Education classes through the new methodology were perceived by the students as positive influences both for learning and for their interpersonal relationships and that promoted a significant participation and a deeper connection with the educational process.

SOCIAL RESPONSIBILITY AND CITIZENSHIP

Social responsibility and citizenship were perceived by the students and were reflected in the statements during the interviews, such as Y02:

I think that the leisure room contributes a lot to the school, because sometimes the teachers are absent and we have nowhere to stay, sometimes it is in the Maloca, sometimes by the court and with the leisure room we have a place to stay. So it was very good to do, to deliver this to the community here at the school, since the room is not only ours, it belongs to the whole school.

In this way, Y02 demonstrated in her speech how she was aware of the needs of the community and her commitment to contribute to the collective well-being, and how much the sense of belonging and responsibility in relation to the social context had been promoted in her, because as soon as the proposal for the Leisure Room came up, she had asked the following question: "Is it for the whole school or just for our class?", which did not show a collective thought.

Another important point was the perception of ethics during classes, where it was possible to experience moments of discussions, such as the dialogue in which M04 said:

"teacher, if this room is open, there will be many students who will skip class", and C01 gave a proposition:

Just leave the key in the coordination, just like the Dance Room. When she needs it, the coordinator releases it and if there are two classes, she chooses who goes, because eighty students won't fit in a room with a sofa, table, chair, that kind of thing.

To which in the interview C01 made the following statement about his perception of learning during classes: "we made the leisure room for all people. We create rules, because not all students understand ethics, someone else acts wrong inside! We spent a long time discussing it, but it turned out good."

In this way, it is possible to observe that the moments in the classroom were seen as provoking thoughts and attitudes that favored the development of values and ethical principles such as respect, equality, solidarity and social justice, which provided a better opportunity for the formation of students as more conscious and engaged citizens.

Also during the interview, the students reported that they realized the importance of active participation in the solution of social problems, such as A03 when she reported smiling about what she perceived in learning with her participation during classes: "the part that I realized the most was that we can change something within the school. Being able to create something within this school for the benefit of everyone, I did it with my little knowledge of 3D, I was able to help!". A03's smile was one of happiness for having helped, contributing to the development of the Leisure Room project.

Another example of this was, during classes, C01 when he had the idea for the project argued as follows:

In my old school when a class was without class, there was a lot of noise in the school hallway, this disturbed the class of the teachers who were in the classroom teaching, sometimes we couldn't even hear what the teacher said in the explanation because of the shouting of those who were without class.

And in the interview he said: "When I gave the idea of the Leisure Room, at the time they were judging me, but I had to defend my idea and then they accepted it, they liked it! I thought this form of class that thinks about how to help people was good."

Freire (2014) emphasizes the importance of education as a practice of freedom, where students are encouraged to critically reflect on their reality and to act to transform it. And with that, having the possibility of being an agent of transformation of their reality, since they understand that they can modify it for the well-being of the collectivity.

In this way, from the recognition of previous skills and knowledge, they were able to exercise, during the application of Solidarity Learning in Physical Education classes, social responsibility and citizenship, and with this they perceived learning when it was carried out through the practical application of identification and search for solutions to social problems.

In addition, the students noticed the development of leadership skills. During the classes, they were encouraged to be agents of change, to defend social causes and to mobilize other people for the common good, as I01 said during the interview when he described his leadership experience: "Making decisions is difficult, especially in the group, but I was able to explain about the leisure room. I had to talk to the director and that was different, it was really cool. And to speak up front I'm really ashamed!",

For the same question, G03 describes: "I was able to help lead the group of games to be able to organize which games were for us, and organize how we could". These experiences lived during classes may have contributed to personal development and to the construction of a critical and participatory leadership awareness of students in society (Bandura; Freeman; Lightsey, 1999).

Thus, the students reported learning and interpersonal relationships during the use of Solidarity Learning in Physical Education classes, when they perceived the development of social responsibility and citizenship, and also highlighted positive feelings when carrying out the activities and overcoming their personal and collective challenges.

STUDENT AUTONOMY

Autonomy was perceived by the students both in classes and in the interviews, as active participation in decisions allowed students to have a prominent role in their own learning process and interpersonal relationships in Physical Education classes with the Solidarity Learning methodology.

An example was M04's suggestion during classes: "we could study the games that can be played in the classroom, how they play, their history and such". when they made decisions about activities, set goals and planned the development of their studies, the students were encouraged to be more autonomous, acquiring self-regulation skills and taking responsibility for their own progress, as M04 evaluated their learning during the interview: "I think this project gave me a greater sense of keeping deadlines".

These results corroborate the studies of Deci and Ryan (2000), who treat autonomy as one of the three pillars of the Theory of Self-Determination, being necessary for intrinsic motivation and personal development. In this sense, the activities were contributing substantially to the formation of autonomous citizens.

In the same way, the valorization of individual skills was also perceived as a driver of autonomy, and this was possible by allowing students to explore their aptitudes, talents and personal interests, as A03 said when presenting his 3D drawing to the school principal:

So, I made a simple 3D project here just to have an idea of what would be inside the room and here it is, the living room project is the same size as here, and here oh, it would be the furniture, I put two tables, chairs, here, I would need an air conditioner, these would be the furniture that would be inside the room.

In this way, they remained more confident and motivated, which demonstrated their perceptions of the learning process through the emphasis on their autonomy, provided in Physical Education classes with the use of Solidarity Learning, which also provided moments of reflection on their propositions, such as the speech of A03 when we inaugurated the Leisure Room: "It didn't turn out the same as I planned, but it was cool."

Another factor that strengthened autonomy and that was perceived by the students was the active participation in the educational process, because throughout the period of application of the methodology, the students were encouraged to make decisions related to their positions. This is exemplified in the speech of M04:

Teacher, let's call the principal and present this drawing, talk about what we have already been through in other schools. One at a time, guys! And no swearing! And if he says he can, we continue, if he says it's not because there is no room or because we have to learn to speak properly, then we study, prepare and try again.

This was reflected in the interview, when M04 referred to this statement that determined the principal's visit to the classroom of the class "[...] Many things I said helped the project, I know, I contributed to the leisure room, I made history in this school". Thus, the students demonstrated that they perceived that the activities promoted in them a sense of belonging and shared responsibility, since their voices were heard and valued.

This strengthening of the students' voice in class contributed to them realizing that they could express their opinions, ideas and perspectives, and thus it was possible to develop communication skills, learn to respect the diversity of points of view and become active and respected members of the school community, as evaluated by A03 their autonomy in the interview:

Most of the time when someone would have to talk either to the director or to a senior representative, I was always the one who started by explaining the project, and this experience was good, because I was able to develop more of a relationship in talking to adult people, things that I was not very good at.

Another point strengthened and perceived by the students regarding autonomy was the dialogue and exchange of ideas, because by engaging in discussions and debates, they had the opportunity to express their opinions, listen to different perspectives and build knowledge collectively, as Y02 said in the interview:

I felt that everything improved, I learned from my colleagues in our presentations, in the discussions of the issues that came up, I also learned to listen more to my colleagues, and to have more self-control when it came to discussions, not to get upset with things, when someone does not accept an idea.

The activities also contributed to the strengthening of leadership skills, autonomy and the construction of a critical and participatory consciousness. This was highlighted in M04's voice during the interview, where he said:

The groups were set up, and someone had to take the lead to be able to organize the group and especially in the study of the games, when it came to doing the research to organize things and I took the lead to organize.

Thus, the students expressed in their speeches, during the classes and in the interview how Solidary Learning enabled them to make decisions and take an active role in the planning and execution of activities during Physical Education classes, which contributed to the development of skills that favored autonomy, a competence highlighted by the BNCC, important to be used throughout life (Brasil, 2018).

MEANINGFUL LEARNING

The significant learning was perceived by the students during the use of the methodology in the Physical Education classes and highlighted in their expressions in the interviews, such as I01 when he spoke of the Leisure Room: "here is a room for leisure, we will be able to be more comfortable, we will be able to stay here without bothering the teachers who are teaching".

By relating the concept of leisure with the benefit to the interests and needs of the school community, I01 was highlighting a greater purpose for his learning, which may have contributed to his formation as a person of deeper engagement and greater knowledge retention.

Also, with the practical and contextualized application of the knowledge covered in class, the students were able to perceive the learning, such as M04's statement about when he evaluated his learning about the impact on the project after missing the deadline for the delivery of an activity: "the notion of deadline can help me in my future profession, in my organization of things outside of school, such as studying on my own."

In this way, M04 made a relationship between a mistake made and the learning he was taking with him for his life. This was possible because the methodology provided the experience of the activities in a concrete way, which allowed M04 and his colleagues to explore the applications of knowledge in the real world and realize the relevance of this knowledge for their life and well-being.

For Ausubel (1982), meaningful learning occurs when new information is connected in a substantive and non-arbitrary way to the student's pre-existing knowledge. With this, learning becomes more relevant and the student realizes his need and possibility of using the knowledge acquired.

Dewey (2023) highlights that education should offer experiences and that in this way learning occurs more effectively, because when students can apply what they have learned conceptually in practical and real contexts, they have better quality of learning and a wide range of meaningful experiences.

In addition, with Solidarity Learning in Physical Education classes, it was possible to build knowledge collaboratively, because by working together, sharing ideas, experiences and perspectives, they realized that they expanded their knowledge, such as C01 who said during the interview: "I didn't know the job! It was something different for me I had never heard of", C01 was referring to a document proposed by Y02 to raise the games in the Planning Stage of the methodology.

In this way, through interactions and collaboration between students, the knowledge produced benefited everyone's learning, and thus the diversity of knowledge and points of view began to be noticed and gained meaning and usefulness for their lives. To what G03 highlighted when evaluating his learning for life: "a better experience with the people who will be passing through during my life, to learn. I can help transform something for the better, too," referring to taking advantage of his knowledge and that of people.

Another point highlighted as perceived by the students that promoted significant learning was the completion of the Leisure Room, because during classes there were holidays, stoppages and strikes of Education professionals in the struggle for rights, which

occasionally led to motivating students by remembering what we were building and discussing with them the benefit that would be brought to the school community with our actions.

To which I02 says in the interview: "The biggest insight was to realize that we managed to do it", referring to the conclusion of the Leisure Room. For M04, the Leisure Room was also an achievement: "I realized that I could do something social, but I had difficulty doing it, because I had never put it into practice, but I managed to do it, the Room is there!", but Y02 in the interview says: "I didn't really believe that we would be able to do the Leisure Room",

The achievement of the Leisure Room was reinforced by the pedagogue in her speech on the day of the inauguration, where she said: "I want to congratulate class 192, who together with the teacher, were in this planning to carry out, then, the Leisure Room inside our Gabriel de Almeida Café school". Which was also reinforced by the director: "It's so cool that we have a positive point for you to adapt better here at school, as is the case with this room that you thought of and carried out".

In this way, the completion of the project determined by them promoted significant learning and the speeches of the pedagogue and the director on the day of the inauguration valued the effort of the students, leading to strengthen their self-esteem and confidence, in addition to creating more meaningful connections with the knowledge learned.

Thus, students emphasize the importance of making learning relevant, collaborative, practical and reflective, valuing personal experiences and stimulating the application of knowledge in real contexts, as was done during the application of Solidarity Learning in Physical Education classes.

FINAL CONSIDERATIONS

This study analyzed the effects of Solidary Learning in Physical Education classes and the results indicate a positive impact of this methodology on the integral formation of students. The implementation of this approach favored the learning process and promoted the development of social and emotional skills.

The students' testimonies revealed a significant transformation in their interpersonal relationships, highlighting the importance of collaboration and teamwork. The exchange of

experiences and knowledge facilitated the learning of academic content and strengthened empathy and mutual respect.

The research evidenced the relevance of autonomy and social responsibility, encouraging students to become protagonists of their actions. This resulted in greater engagement in the proposed activities, while the creation of the Leisure Room met a demand from the school community.

In addition, the room served as a space for reflection and practical learning, allowing students to apply their knowledge in real situations. Data analysis revealed that meaningful learning occurred when students were able to connect new information to their prior knowledge.

The Solidarity Learning methodology provided a context in which students could explore their individual and collective skills, broadening their perspectives and contributing to deeper learning. This study contributes to the discussion about the importance of active methodologies in education.

Innovative pedagogical practices are essential to prepare students for the challenges of the twenty-first century, forming not only more competent students, but also more conscious citizens. The continuity of research in this field is essential to deepen the understanding of the effects of these methodologies on classes and to improve educational practices in different contexts.

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