

ESPACIOS Y METODOLOGÍAS EDUCATIVAS INNOVADORAS PARA TRABAJAR LA INTERDISCIPLINARIEDAD

INNOVATIVE EDUCATIONAL SPACES AND METHODOLOGIES TO WORK ON INTERDISCIPLINARITY

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Resumen

Los espacios y las metodologías educativas innovadoras cobran un nuevo sentido en el actual panorama educativo. Vamos a analizar la importancia de los espacios, las metodologías innovadoras y la interdisciplinariedad en el campo educativo y de como puede favorecer el aprendizaje del alumnado. En un primer momento analizamos la importancia de los espacios dentro del sistema educativo y las ventajas en el proceso de enseñanza-aprendizaje. También estudiamos las Aulas del Futuro o Aulas Transformadoras para mejorar el aprendizaje del alumnado mediante las mismas a través de la distribución en el aula. Pero todo ello no es posible si no le sumamos las necesarias metodologías educativas innovadoras que desafían el modelo tradicional de enseñanza fomentando la participación activa de los estudiantes y el trabajo en equipo. Diversos estudios demostrarán que a través de estos elementos se mejora el

proceso de enseñanza-aprendizaje, influye en el rendimiento académico del alumnado y que el espacio debe ser un elemento más de la actividad docente, por ello es necesario estructurarlo y organizarlo adecuadamente. La clave es generar prácticas educativas a través de espacios y metodologías educativas innovadoras para trabajar la interdisciplinariedad en el proceso de enseñanza-aprendizaje.

Palabras clave: *531204 Educación, 580100 teoría y métodos educativos, 610402 métodos educativos, 610701 metodología, 530602 innovación tecnológica.*

Abstract

Innovative educational spaces and methodologies take on a new meaning in the current educational landscape. We are going to analyze the importance of spaces, innovative methodologies and interdisciplinarity in the educational field and how it can favor student learning. At first, we analyze the importance of spaces within the educational system and the advantages in the teaching-learning process. We also study the Classrooms of the Future or Transformative Classrooms to improve student learning through them through the distribution in the classroom. But all this is not possible if we do not add the necessary innovative educational methodologies that challenge the traditional teaching model, encouraging the active participation of students and teamwork. Several studies will show that through these elements the teaching-learning process is improved, it influences the academic performance of the students and that the space should be one more element of the teaching activity, for this reason it is necessary to structure and organize it properly. The key is to generate educational practices through innovative educational spaces and methodologies to work on interdisciplinarity in the teaching-learning process.

Keywords: *531204 Education, 580100 educational theory and methods, 610402 educational methods, 610701 methodology, 530602 technological innovateon.*

1. INTRODUCTION

In the 21st century, education faces many challenges arising from an ever-changing world. Technological advances, globalization and the demands of an increasingly complex society require new forms of teaching that foster interdisciplinarity and prepare students for the challenges of the future. In this article, we will explore the concept of Classroom of the Future, Transformative Classroom, innovative methodologies and interdisciplinarity in education, analyzing how these elements can be integrated to provide an enriching and meaningful educational experience.

Innovative educational spaces and methodologies are present in the Organic Law 3/2020 amending the Organic Law 2/2006 of May 3, 2006 on Education (LOMLOE) and its curricular implementation in the Royal Decree 157/2022, of March 1, which establishes the organization and minimum teachings of Primary Education (Royal Decree 157/2022) and in the Comunitat Valenciana in Decree 106/2022, of August 5, of the Consell, on the organization and curriculum of the Primary Education stage (Decree 106/2022).

Over the last decades, education has evolved significantly from an exclusively theoretical process to a more practical and participatory one. Interdisciplinarity in education is born through the development of innovative methodologies to respond to the need to work together and coordinate different disciplines and areas of knowledge. We will analyze interdisciplinarity as a utility in innovative educational methodologies and we will analyze innovative educational spaces and methodologies to promote interdisciplinarity in the classroom.

In the educational field, interdisciplinarity has become a key approach to promote comprehensive and holistic education. The interaction between different disciplines fosters more meaningful learning, enabling students to develop transferable skills and understand the complexity of the current

world. Through interdisciplinary work across various areas and collaborative efforts, we can enhance the educational process.

Interdisciplinarity corresponds to an integration of knowledge in which different areas of knowledge are related to achieve significant learning from different areas of knowledge. Using different innovative educational spaces that have been appearing in our educational system, we can improve through the environment and methodologies, creating a change that will go beyond traditional methods.

The LOMLOE states in its preamble that the Spanish educational system must face the new challenges and difficulties that current education generates. All in all, we will have better trained and more motivated students to continue learning inside and outside the classroom. But, above all, students prepared to face the challenges and needs that the learning society is demanding of them, especially at this time through new spaces and innovative methodologies.

2. METHOD

We will analyze several elements by reflecting on different types of spaces that serve to enhance learning such as Future Classrooms or Transformative Classrooms, to move towards flexible and accessible classrooms. These elements serve as a resource through flexible spaces, educational technologies, and active methodologies. Furthermore, advancing in interdisciplinarity allows us to develop key and specific competencies by using active methodologies, flexible spaces, and other tools.

Firstly, we will examine how the importance of spaces has been integrated within the educational system with the new reform of the LOMLOE to be able to work in an interdisciplinary way through the different areas. In Royal Decree 157/2022, in the area of Knowledge of the Natural, Social and Cultural Environment, learning situations must be an open space

that encourages students' curiosity and analytical observation to build their personal position in the face of reality, a position that must be considered potentially transforming the existing social reality. In Spanish Language and Literature, it specifies that the school library, understood as a creative learning space, will be the ideal environment to work through global and interdisciplinary projects.

Delving into the Decree 106/2022 of the Comunitat Valenciana, it states that schools must take actions to promote reading dynamism and the management and dynamism of the school library as a flexible educational space, a center of information, reading, and culture that fosters autonomous learning and acts as a social compensatory factor, promoting equality and diversity. Planning and organizing time and spaces for reading, creativity, and cultivating positive attitudes towards reading and culture in all areas and domains will be necessary. These actions should be specified in official documents that develop the school's educational project and include a daily reading time with the aim of fostering reading habits and the enjoyment of reading through various formats and types of materials. The regulations grant schools autonomy to flexibilize organization, teachings, spaces, and schedules to promote methodological alternatives, with the objective of personalizing and improving the learning capacity and outcomes of all students.

Regarding school spaces, emphasis is placed on the idea that all areas within the school are educational and should foster a climate of well-being. They should be welcoming, organized, aesthetically cared for, and offer opportunities for play, freedom of movement, social interaction, exploration, and rest. The practices and management of spaces should prioritize sustainability and respect for the environment. In outdoor spaces, schools should incorporate natural elements that enable students to act and interact in contact with the natural and social environment. Simultaneously, spaces and contexts should be designed to be meaningful

and rich in opportunities for relationships, autonomy, communication, natural curiosity, and students' desire to learn. These spaces should also serve as places for collaboration and investigation among students. With all this information related to educational spaces, classroom planning will be a result of pedagogical reflection, serving as a flexible and open instrument in constant construction, review, and improvement, organizing the learning spaces. Inclusion will be present in response measures and spaces, times, and methodological alternatives will be used to personalize and improve the learning and outcomes of all students.

The spaces and scenarios must be diverse, since there are different places that can serve as triggers to generate proposals with which to explore the possibilities. The spaces of the center itself, and those outside the center and those of the network itself can become sound laboratories with which to investigate, explore and create. In the same way, the different spaces and the elements that make them up can be multiple and varied places of creation.

2.1 FUTURE CLASSROOMS

The Future Classroom is a project that promotes a methodological change based on the modification and innovative management of educational spaces (classrooms, school libraries, etc.). Within the actions of the project aimed at schools and teachers at non-university educational stages, training is provided in the use and management of these innovative spaces for daily teaching practice, which is carried out in spaces called "Future Classroom", managed by the competent educational administrations. This project has its origin in 2012, in the European initiative Future Classroom Lab (FCL), launched by European Schoolnet in Brussels. In 2017, the Future Classroom space was inaugurated as a starting point for the creation of a network of connected classrooms in the different autonomous communities, spaces for innovation and learning for teachers.

It is a physical space based on a specific pedagogical approach, with specific furniture and technology, designed to improve students' learning processes and to teach teachers to create learning scenarios based on active methodologies using digital technologies, beyond the expository classroom experiences.

The objective of the Future Classroom is to offer teachers a reference model to promote methodological changes in their daily teaching practice through the creation and organization of flexible spaces. At the same time, each classroom should respond to the needs of the educational community that will use it and should be adapted to the work to be developed.

Specifically, we can point out some objectives such as promoting reflection and evaluation of educational centers regarding the creation and management of innovative learning spaces, training teachers in the use of innovative learning spaces that include the use of digital technologies to favor teaching and learning processes, and promoting the creation of learning scenarios based on detecting and disseminating good practices that serve as examples for the digital transformation of centers.

In these innovative educational spaces, the environment is equipped with advanced technology, interactive devices, virtual and augmented reality, and digital tools that facilitate exploration and discovery. In addition, flexibility in the arrangement of furniture and the creation of areas adapted to different learning modalities are promoted. This space is equipped with state-of-the-art technology and digital tools that allow collaborative and coordinated work in different disciplines and areas of knowledge. The Future Classroom encourages teamwork, active participation and critical reflection and fosters the development of skills and competencies such as creativity, problem-solving skills, and the ability to adapt to changes.

This reconfigurable learning space is divided into six zones: investigate, explore, interact, develop, create, and present, which are

intended to encourage and stimulate the teaching and learning processes, making the student the protagonist of the whole process.

The equipment includes digital whiteboards and touch screens, various mobile devices, recording cameras, virtual reality glasses, specific school furniture, materials to facilitate research and computational thinking, a small recording studio and a traditional work corner.

All this material is organized to encourage the teacher to expand his role as transmitter of content to moderator, advisor, coordinator and, above all, as a guide for his students in the learning process, thus moving from a traditional methodology, in which the student is a mere receiver of content, to an active and integrative methodology, which allows the student to play an active role, while the teacher attends to the different rhythms and learning styles, thus promoting educational inclusion.

During the last few years, learning has not only focused on content, but has also evolved towards the acquisition of competencies. On the other hand, there is a wide variety of digital technologies that provide many possibilities in a classroom. The Future Classroom model combines methodology, technology, and activities in different areas.

2.2 TRANSFORMATIVE CLASSROOMS OF SPACES AND EDUCATIONAL METHODOLOGIES

In the Comunitat Valenciana, the Subdirección General de Formación del Profesorado creates a network of training classrooms under the name "Transformative Classrooms of Spaces and Educational Methodologies". These are innovation laboratories as a sample of the possibilities of organizing flexible spaces with versatile furniture and state-of-the-art technology, for the use of educational methodologies that favor the development of skills and competences. They are not models of classrooms to be replicated by the centers; they are a sample of different forms of organization and furniture for teachers to experiment with, but not to be replicated as they are in a classroom at the center. The objectives are

to develop training sessions with the aim of exploring the pedagogical possibilities of making learning spaces more flexible in combination with technologies, improving teaching and learning processes through active methodologies, promoting reflection on methodologies, their use and their adaptability to the reality of the classroom, facilitating experimentation with different types of versatile furniture to create varied learning situations and showing the possibilities of using different technologies in the teaching/learning processes.

The Transformative Classroom is an innovative educational space that is characterized as an inclusive and diverse space that promotes active participation and critical reflection of students. This space is designed to foster creativity, innovation, and autonomous and collaborative learning. It is based on the idea that learning should not be a passive and exclusively theoretical process, but rather an active and participatory process in which students are the protagonists of their own learning process.

The Transformative Classroom concept goes beyond the implementation of technology or innovative methodologies. It refers to a profound change in the way education is conceived, putting the student at the center of the process and adapting it to their individual needs. It focuses on the integral development of the student, fostering social-emotional skills, digital competencies, and global citizenship.

It requires the use of active methodologies to develop the learning competencies pursued by the LOMLOE and that these competencies can be achieved by all students. Innovative methodologies are usually linked to the use of technology that facilitates teaching and learning to develop 21st century competencies in our students.

2.3 INNOVATIVE EDUCATIONAL METHODOLOGIES

Innovative methodologies focus on challenging the traditional teaching model based on the transmission of knowledge. These methodologies encourage active student participation, teamwork, and the

resolution of real problems, allowing a closer connection between curricular content and the daily reality of students.

Innovative methodologies focus on how teaching is delivered and how students learn. Some prominent examples include Project Based Learning (PBL), Cooperative Learning (CL), Design Thinking and Game Based Learning (GBL) as a pedagogical tool, among others.

We will now analyze in more detail the most generalized one, which is Cooperative Learning. It is a pedagogical model focused on group learning and mutual help, the inclusion of all students and autonomy. The advantages that support it are the defense of inclusive education. It promotes cooperation, teamwork, mutual help, solidarity, and student autonomy. The student learns by himself and from other students since learning is no longer unidirectional but bidirectional, where the space is transformed favoring interaction among students.

Another outstanding methodology is Project Based Learning (PBL), where students work on real projects that involve the application of knowledge in authentic contexts (Thomas, 2000). This methodology encourages autonomy, research and problem solving. It is intended that the student learns to develop as a professional capable of identifying and developing different projects. It is intended to structure knowledge by developing reasoning processes and learning skills through motivation for learning and the ability to develop teamwork.

Finally, we will talk about the flipped classroom, proposed by Bergmann and Sams (2012). In this modality, students acquire knowledge through previous materials before class, and classroom time is used for practical activities and discussion, promoting active participation. Certain processes are transferred outside the classroom and class time is used, together with the teaching experience, to facilitate and enhance knowledge acquisition and practice processes in the classroom. The advantageous elements are that learning is adapted to the pace, space and

time chosen by the student, promoting attention to diversity since the pace and level of learning is adapted to the needs of each student. It is closely linked to the cooperative learning that we mentioned earlier when working on the procedural part in the classroom. In addition, families are much more involved as they are made to participate in the learning of their children favoring the digital competence of students that is pursued in the LOMLOE.

2.4 INTERDISCIPLINARITY

Interdisciplinarity in education involves the integration of different disciplines to address complex problems and develop critical and reflective thinking. As stated in the LOMLOE, the possibility of unifying different disciplines in the so-called "Interdisciplinary Projects" allows the connection between the different areas of knowledge, fostering a deeper and more global understanding of the subjects studied, stimulating the students' ability to transfer and apply what they have learned in different contexts. It also promotes collaboration between teachers from different areas and the creation of interdisciplinary projects that involve students in the resolution of multidimensional challenges.

Interdisciplinarity implies the integration of different disciplines or areas of knowledge to address complex problems from a global perspective. It breaks with the traditional compartmentalization of knowledge and encourages the connection of ideas and the transfer of skills. According to Fink (2003), interdisciplinarity promotes critical thinking, problem solving and creativity.

3. RESULTS

Analyzing in-depth the elements aforementioned, the combination of innovative educational spaces, disruptive pedagogical methodologies and interdisciplinarity in education can enhance students' learning in a significant way. These elements complement each other to create a

perfect environment for learning to take place in a more complete and global way.

Interdisciplinarity is based on the coordination and joint work of different disciplines and areas of knowledge to address a problem or a specific topic in an integrated manner. This methodology is grounded on the idea that complex problems and topics cannot be approached in isolation from a single disciplinary perspective, but that it is necessary to work together and coordinate different disciplines to obtain a more complete and deep vision of the topic in question.

Interdisciplinarity in education fosters the cultivation of a wide array of skills and competencies such as teamwork, analysis and synthesis, problem-solving, and critical reflection. It involves collaboration between different academic disciplines, which can be encouraged through the creation of suitable educational spaces. Flexible and open environments, like collaborative classrooms and learning labs, promote interaction among students from various fields and facilitate the integration of knowledge. Additionally, the use of educational technology, such as digital whiteboards and interactive tools, enables students to access resources from different disciplines simultaneously, fostering the transversality of knowledge.

In terms of innovative educational methodologies, the project approach and flipped classroom are effective strategies to promote interdisciplinarity. These methodologies allow students to address complex challenges that require the application of knowledge and skills from different areas. In addition, the integration of interdisciplinarity in educational assessment is fundamental to encourage students' active participation in the learning process.

All this is framed and influenced by the changes in education and the need to develop 21st century competencies. Previously it was essential to transmit knowledge, nowadays technology provides us with immediate access to any data in different formats, which makes students not only

need to memorize but also other skills that allow them to search, discern, select, or use this data. That is why the guidelines and orientations shared worldwide on how teaching and learning should be designed nowadays are focused on the development of skills and competencies.

The competencies of the 21st century can be organized into three groups that are totally interconnected and fundamental for success in learning, work, and life. One of them are the learning capabilities that relate learning to learn (Key Competence within the LOMLOE), lifelong learning, critical thinking and problem solving, and creativity and innovation, among others. In addition, work skills such as communication and collaboration. Finally, life skills related to citizenship, social and personal responsibility, among others.

Students will develop their reflective, observational, investigative, and argumentative skills in a meaningful, applicable way, as real and as close as possible. This work process is the ideal context for an efficient, appropriate, and safe use of resources, spaces, methodologies, and digital devices. Students are encouraged to become progressively more autonomous in their learning. To encourage this, the role of the teacher is crucial, facilitating a correct scaffolding and subsequent feedback, treating error as a natural and necessary part of learning.

The performance of students requires mobilizing a set of skills, procedures, and concepts that enable them to successfully address various actions in broader contexts. Students should be able to mobilize competencies, knowledge, resources, including ICT tools, and attitudes to tackle broader and more relevant challenges for society, aimed at dealing with the major challenges of the 21st century.

Finally, the ISTE Report (2015) concludes that intentionally designed classrooms for active learning increase student engagement when compared to traditional classrooms. In the same report by Basye et al. (2015), they address the need to reimagine the classroom which should be

flexible and multifunctional. Studies and research lead us to analyze the learning spaces we have and determine what we need. However, for this to happen, teachers must rethink their practices to maximize the potential of 21st-century students. Changes are planned, analyzed, and implemented based on the pedagogical needs of the modern student.

The research "The so-called 'third teacher' becomes a key figure for learning in the digital age", considers the space as the "third teacher", since it is a key element that influences the student. If the furniture is flexible and has wheels, it helps to be able to change the learning activity during the same session or offer variations depending on the activity. Circular tables encourage communication and interaction and also improve overall well-being and learning. The results conclude that innovative and flexible spaces are actually much better in all aspects measured than ordinary classrooms.

4. DISCUSSION

It is especially interesting to detail the importance of methodologies, spaces and interdisciplinarity based on studies that show that these elements improve the teaching-learning process.

Muntaner, Pinya and Mut (2020) carried out a study to find out whether the application of active teaching methodologies in primary education has consequences on the academic performance of these students. Their results show that the use of active methodologies are the future due to their potential and numerous benefits. The use of active methodologies in the primary education stage can and should be the driving force for change in the teaching-learning process and for adaptation to current social demands.

To this end, assessment must also change, instruments and criteria must be incorporated to assess all abilities, to accommodate diverse

students and to assert competencies not considered until now (Muntaner, Pinya and Mut, 2020).

Definitely, the change to a model based on the construction of knowledge by students implies a large-scale transformation. Changes at the organizational, didactic, methodological and space levels, to significantly improve academic results and the expectations that society expects. Today we need critical, committed citizens, and above all, citizens capable of learning to learn and adapting to the dizzying changes we are facing.

Muntaner, Pinya and Mut (2020) finally emphasize that in the methodological design, grades should not be considered as the only variable of academic success. It is essential to incorporate the students' competency approach to demonstrate the direct relationship between active methodologies and learning processes, since these are usually focused on the development of students' competencies. We must move towards competency-based learning, leaving behind mere traditional qualification.

Laorden and Pérez (2002) detail that the space must be one more element of the teaching activity and, therefore, it is necessary to structure and organize it adequately. We understand that the environment of the center and the classroom is a very valuable tool for learning, and therefore it must be the subject of reflection and planning for the teacher as specified by current regulations.

Pagano and Pérez (2015) emphasize that it is necessary to delve a little deeper and become aware of the importance of space, its relationship with objectives and methods, and its facilitating aspect of learning. Through their experience, they relate interdisciplinary elements to enhance learning through active methodology, promoting reflection, creativity, and autonomy. They also detail that teamwork involves joint decision-making, which should be a regular practice in educational centers.

In their study, they determine the effectiveness of interdisciplinarity between various areas of knowledge to improve learning in primary education. Interdisciplinary work allows for meaningful learning of disciplines, enhancing overall grades through the development of integrated knowledge within interdisciplinary units.

The interdisciplinary model brings improvements for both teachers and students, as it generates greater motivation and promotes the integration of knowledge, overcoming the fragmentation and isolation of knowledge. Students develop their conceptual structures much more effectively.

According to their study, interdisciplinarity is not merely the sum of knowledge from different areas but rather the integration and articulation of disciplines to produce solutions to various learning problems. It eliminates individualistic positions of subject areas and allows for a more articulated and better-organized curriculum, suited for globalized knowledge.

CONCLUSIONS

In education, interdisciplinarity is fundamental to prepare students comprehensively and endow them with relevant skills for today's world. Innovative educational spaces and pedagogical methodologies based on interaction and collaboration between disciplines play a crucial role in this approach as we have detailed and justified throughout the article. Teachers must foster flexible environments, use technology effectively and apply active methodologies that promote interdisciplinarity. This will allow students to develop a deep and contextualized understanding of knowledge, preparing them to face the challenges of contemporary society.

Different spaces have been analyzed, such as the Classroom of the Future and the Classrooms Transforming Educational Spaces and

Methodologies that through the use of various innovative methodologies will favor and improve the development and educational progress of students, as shown by the evidence of the studies detailed above.

It has been explained that the scenarios and spaces of the center itself, as well as those of the classroom, must be diverse, in addition to the multiple and varied places of creation. The Classroom of the Future promotes methodological change by modifying the innovative management of educational spaces with furniture and technology designed to improve the learning processes of students. It aims to promote methodological changes in teaching practice through flexible spaces combining methodology, technology, and activities in different areas.

The Transformative Classroom of Spaces and Educational Methodologies promotes active participation and critical reflection of students. It is based on the idea that learning should not be a passive and exclusively theoretical process but should be an active and participatory process in which students are the protagonists of their own learning process.

It requires the use of active methodologies to develop competency-based learning through innovative approaches that promote active participation, teamwork, and problem-solving, allowing for a closer connection between the curriculum content and students' daily reality.

All of this is related through the interdisciplinary nature of knowledge areas. This will enable us to develop the necessary skills and competencies, fostering the transversality of knowledge.

All these organizational, didactic, methodological and space changes will help us to significantly improve academic results, society's expectations and adaptation to the dizzying changes we are facing. This should be the type of work that should be in the future the usual practice in educational centers.

The aim is to develop a transformative school to develop the individual in the construction of knowledge and then learn to apply it.

The key is to generate educational practices through innovative educational spaces and methodologies to work interdisciplinarity in the teaching-learning process.

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