ORIGINAL PAPER

Teaching practices with an interdisciplinary approach

Daniela Scorțan[1]

Abstract:
Interdisciplinarity facilitates the learning process through which the learner experiences the connections between his reality and that of the world, through concrete learning activities requiring an act of personal and social engagement. The integration of interdisciplinary educational activities stimulates students to find concrete meaning in learning. The students learn to make connections between concepts and skills in related subjects and, subsequently, with everyday life. We must build a bridge between the disciplines based on the similarities established between them in terms of learning content, concepts and technical and cognitive skills. The integration of subjects allows teachers to go beyond textbooks in order to make learning more meaningful and satisfying for the learner. Interdisciplinary projects also offer a more enriched knowledge of the subject under study, an openness to what other disciplines can offer and a better perception of the role of disciplines. A learner preparing an interdisciplinary project focuses as much on "how he learns", that is to say, on the development of his personal data collection method and problem solving as well as the establishment of links between the subjects and the concepts learned for each isolated subject. Interdisciplinarity contributes to the development of better social and cultural interaction and the ability to solve everyday problems. Interdisciplinarity also promotes the development of higher cognitive skills such as critical thinking, the spirit of synthesis and integration, reflective skills, the understanding of difficult concepts and conceptual memory. Interdisciplinarity seems to result in better learning of better attitudes among students and a better relationship between teachers and students. In addition to contributing to the construction of learning, interdisciplinarity promotes the integration and updating of the person.
Keywords: *interdisciplinary, learner, project, skills, knowledge, relationships.*

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[1] Lecturer, Ph. D., University of Craiova, Department of Applied Modern Languages, Romania, Phone: 0720.154.311, Email: danielascortan@yahoo.com

Daniela Scorțan

Introduction

Interdisciplinarity allows us to approach a subject or concept from various perspectives. It relies on the interaction between different disciplines to exploit complementarity and offer a complete panorama of the concept discussed. Students can thus benefit from a global and contextualized understanding, and teachers find themselves confronted with a new way of mobilizing their skills.

It is appropriate here to distinguish interdisciplinarity from multidisciplinarity. The first involves active cooperation between the different subjects, where each contributes to a common vision of the theme studied. Multidisciplinarity, for its part, consists rather of parallel teaching of different fields without real interaction between them.

For the majority of authors, including (Choi & Pak, 2006), we can define, basically three types of interdisciplinarity: multidisciplinarity which is a juxtaposition of different disciplines without knowledge integration, interdisciplinarity which is the synthesis of at least two disciplines and which induces the establishment of a new level integration and discussion of knowledge and transdisciplinarity where disciplines no longer appear and where we study dynamics of entire systems.

The nuance between multidisciplinarity and interdisciplinarity is however more tenuous and Klein (2010) provides additional light by affirming that a project becomes interdisciplinary when the integration and interaction of different disciplines become proactive, in other words when the members are always attached to their discipline while working together to resolve a common problem.

In their work Chirițescu & Păunescu present (2020: 249): „an interdisciplinary landscape of the complex topic of legal translation, successfully combining linguistics (both diachronic and synchronic), sociolinguistics, pragmalinguistics, intercultural communication and, last but not least, translation studies."

It is important to specify that the implementation of an interdisciplinary project does not necessarily reconsider the notion of discipline, on the contrary. The complementarity between disciplinarity and interdisciplinarity is essential in the creation of an interdisciplinary project (understanding the parts in order to understand the whole and understanding the whole in order to understand the parts). There cannot be an interdisciplinary school project without disciplinary learning of the notions of base. If we want to understand a global phenomenon in its entirety and go into an in-depth understanding, gaps in disciplinary knowledge would be a major problem.

After a few years of practice or even at the start of their professional career, teachers are often searching for new methods or approaches to implement in order to manage a classroom problem, to develop their teaching or simply to break the routine. Interdisciplinarity has the quality of offering rich and differentiated systems linked to the environment when organizing educational activities. These activities can be particularly motivating for the teacher and provide a challenge that meets his expectations. By its nature, interdisciplinarity also requires great collaboration within the teaching staff and these sharing opportunities are essential to stimulate reflection, encourage the exchange of knowledge and experiences, and alleviate the feeling of loneliness, especially during difficult or weak moments.

Interdisciplinarity can be an advantage in the organization of an institution. In the long term, it allows tending towards a curriculum unit and thus deal with more complex subjects or themes such as ecology, health, economic growth. By its nature of wanting to connect the school knowledge and that of everyday life, interdisciplinarity is

an approach that takes into account socio-economic needs and cultural aspects of the society. Finally, for institutions, it is an economic approach of knowledge appropriation. Indeed, faced with the exponential explosion of knowledge, having a holistic approach helps avoid repetition of subjects and thus promotes a mutual support system between academic disciplines.

The principles of an interdisciplinary approach

We have chosen to define four principles on which the construction of an interdisciplinary practice is based. These four parameters, prior to action, are not chronological stages. Like a system, they constantly interfere with each other, and feed off each other. Isolating each parameter must be simply understood as a way of analysing the construction processes of these actions and identifying methodological principles more clearly.

The four parameters are: the creation of a team culture (relationships between teachers), the articulation of the disciplines (the concepts taught), the choice of a working theme (the learning situation) and the organization (the necessary conditions for functioning).

The educational implementation will occur as the result of these four parameters, the moment when reflection is transformed into action. Team culture is a necessary condition for an interdisciplinary project: creating links between disciplines requires that teachers work together, communicate and construct educational approaches. But it is also a consequence. Indeed, interdisciplinary action contributes to creating a culture specific to an educational team. Every member of the team is enriched by the reflection of the other, by his conception of things. The desire to give meaning to action, to training, the concern for efficiency contributes to the progressive development of a common team culture.

The psycho-affective dimension in building a team is not negligible. Of course, it is easier to work with people „that we like", but the question that arises is rather to know how to work together while going beyond emotional divisions. It is important to design the work in team as a skill to be acquired and not as an eventuality subject to affinities. Also, the investment is not the same for all teachers, depending on the objectives of each discipline. Before any educational project, teachers should discuss what motivates their participation in the action, agree on training objectives and identify common educational goals. Debating, discussing, and arguing leads to better understanding, to accepting the diversity of points of view in order to take them into account in action. The richness of the teaching teams comes from the diversity of approaches and methods. On the other hand, wanting to „standardize" them, make them uniform could contribute to an impoverishment of learning.

All this capacity for teamwork requires developing a certain number of skills, which are acquired, and do not simply depend on the personality of the teacher: listening to others, respecting what it is said, argumentation, conflict management, meeting management, animation techniques. Working as a team helps everyone evolve in his representation of teaching: the teaching profession becomes a profession of exchanges, adaptation, solidarity practices negotiated in a logic of cooperation.

Concerted and articulated work in interdisciplinarity does not mean that all teachers systematically find themselves together in the class to share the animation time. Some sequences may be common, others not. It is during the preparation for the project implementation that these modalities are decided. This new dynamic, resulting from

collective work, is similar to teacher training. The permanent exchange enriches the reflections and stimulates the work of the teacher. It is both a source of motivation and an entry into a research/action process that is built collectively, through the permanent search for new learning solutions.

This team culture is perceived as an additional asset by the students: it demonstrates the cohesion of the teachers, the coherence of learning and gives meaning to the training. One of the challenges of interdisciplinarity is the ability to construct in students a global vision of a complex situation, and to make connections between knowledge from different disciplines.

The concept of interdisciplinarity is based on a constructivist hypothesis of learning. According to Kaufman & Brooks (1996: 234-235): „Constructivist teachers look for and value the students' points of view. Understanding the students' points of view helps the teacher determine where and how instruction can facilitate learning. Teachers adapt curriculum to challenge students' suppositions. The opportunity to reflect on one's present assumptions, premises, beliefs, or conceptualizations facilitates cognitive growth. When teachers design lessons that provoke students to confront their initial suppositions, teachers maximize the likelihood of student learning. Finally, constructivist teachers assess student learning authentically and within the context of teaching. They set up systems and settings in which students can exhibit work and share ideas with classmates, and they use nonjudgmental responses when responding to students' work."

Knowledge construction

There is learning only in response to a question. It is the student who builds his knowledge by gradually overcoming obstacles to understanding the problem. Knowledge construction by the student requires the implementation of practices where the student acts, questions, clearly poses to himself the problems he wants to solve, responds and expresses himself freely, takes initiatives, makes contributions, becomes a real interlocutor for the teacher in reciprocal exchanges where he produces knowledge. We observe, in a way, a reversal of the meaning of knowledge: it is no longer the teacher, the bearer of knowledge, who disseminates it to the student, but it is the student who, in an active approach, appropriates the necessary knowledge for action. The teacher is then the mediator between the student and knowledge.

For the student to construct complex knowledge, this presupposes that the teachers themselves have carried out a joint analysis of the links that exist between the disciplines, with regard to a real situation. The disciplines are then positioned as tools for understanding a situation. How to move from isolated encyclopaedic knowledge to knowledge that facilitates action is the objective that teachers set for themselves through interdisciplinary practices.
The student's appropriation of the problem is reinforced when he can compare his own vision with other students.

In group work, beyond the interest of the collective challenge, the student finds himself in a permanent negotiation, in this need to argue and have his proposed responses validated, in the face of other divergent proposals. This situation of conflicting points of view is particularly formative because it helps the student in the transformation of these initial representations. On the other hand, we also see that motivation increases when a collaborative relationship is established between students; new behaviours can thus be developed (listening, mutual aid, solidarity).

Teaching practices with an interdisciplinary approach

According to Jacobs, H. H. (1989: 2): „Effective interdisciplinary programs must meet two criteria. They must have carefully conceived design features: a scope and sequence, a cognitive taxonomy to encourage thinking skills, behavioral indicators of attitudinal change, and a solid evaluation scheme. They must use both discipline-field-based and interdisciplinary experiences for students in the curriculum."

According to MacLeod (2018: 709): „Opacity problems generate mismatched communication and uncertainty in interactions between collaborators which make it very difficult to coordinate practices in productive ways. In other cases, the problems might be less directly due to a lack of technical insight into one another's practices and more due to the fact that the conceptual and methodological distance between the cognitive domains is very large. As mentioned, philosophers often identify such divides, and sometimes propose ways, in theory at least, to bridge them. However sometimes there might be no straightforward way to translate or link models or concepts from the different domains, without solving very complex problems neither domain is well-adapted to solve with its current sets of practices. Importantly it may require significantly restructuring practices in those domains in ways which conflict with the way practices in those domains have been designed and optimized. In such cases domain specificity becomes a particularly intransigent obstacle."

The advantages of interdisciplinary approaches

Interdisciplinary approaches have many benefits for students and teachers. These practices establish an optimal learning climate, stimulate the motivation and critical thinking of learners, and promote teamwork and skills management. The interdisciplinary approach allows students to discover different aspects of a concept or subject.

According to Lăpădat & Lăpădat (2020: 144): „it is very important to organize activities, intercultural, interdisciplinary and extracurricular experiences that would have the role of putting into practice the concept of language learning through discovery and through their own experiences. The intercultural perspective, used in the process of teaching and learning a foreign language, has the role of preserving its own identity by becoming aware of the mother tongue and culture, on the one hand, contributing, at the same time, to the development of intercultural communication skills."

By comparing their knowledge with that of other fields, they are able to form a more complete and coherent idea of the object of study. This method also helps them see connections between disciplines and contextualize their learning. By combining several perspectives in the analysis of a problem, students are encouraged to think differently and take a critical look at the information they receive.

Interdisciplinary approaches also encourage creativity since they invite students to explore new ways of thinking and to innovate in solving complex problems. As students are projected in a real and complex context, their motivation increases and they seek to understand the world around them. They become actors in their own learning, and consequently, develop greater autonomy in their work.

Interdisciplinary projects encourage teamwork between teachers and students. Everyone must coordinate their actions with those of other members, share their skills and invest effectively to carry out the team task. In this way, cooperative learning is stimulated and everyone acquires relational skills essential to any actor in our contemporary society.

According to Kuh, G.D., Kinzie, J.L., Buckley, J.A., Bridges, B.K. and Hayek, J.C. (2006: 66): „Widespread use of effective pedagogical practices must be at the core of any agenda to promote student success. (...) This restructuring movement is characterized by a shift in emphasis from faculty teaching to student learning (Barr and Tagg). This shift promises to have profound implications for setting higher expectations for students, for raising academic standards, for asking students to take more responsibility for their learning, for demonstrating competency through assessment, and for emphasizing and validating alternative ways of knowing, interdisciplinary methods, and problem-focused learning.”

Interdisciplinarity, according to Wood (1997), facilitates the process of learning through which the learner experiences the links between his reality and that of the world, through concrete learning activities requiring an act of personal and social commitment. The students learn to make connections between concepts and skills that make reference to related subjects and, subsequently, to everyday life.

We must build a bridge between disciplines based on the similarities established between them in terms of learning content, concepts and technical and cognitive skills. It is important to note that any interdisciplinary approach is learner-centred rather than subject-centred. The ultimate goal of teaching is the integration of knowledge that the learner does, and not the accumulation of notions and of isolated skills. Thus, according to Pigdon and Woolly (1993), more emphasis is placed on the „learning process” than on the „content of the material”.

How to implement interdisciplinary approaches?

Define a common objective: it is essential to establish a unifying project or theme around which the disciplines will come together. This objective must be sufficiently complex and interesting to require the contribution of several subjects.

Create a multidisciplinary teaching team: teachers must work together to develop their common teaching sequences and scenarios. Good communication and involvement of each member are necessary.

Organize time and space: a precise and flexible plan must be established in order to manage meetings between teachers and students, as well as to optimize the use of learning spaces dedicated to this approach.

Promote creativity and innovation: teachers must encourage students to explore original paths and go beyond traditional disciplinary frameworks.

Establish a pragmatic evaluation: the evaluation must be done on the basis of the learning achieved and the active participation of students in their interdisciplinary project. The evaluation criteria must be adapted to take this dimension into account.

Students' social and personal capabilities can also be developed thanks to the complexity of the tasks. Indeed, the social interactions between students or between the student and the teacher are very well-developed, because an interdisciplinary approach promotes humility, listening and tolerance and thus helps to limit individualism for the benefit of the group spirit and collaboration. In addition, they leave the possibility for the teacher to grant more freedom to the student and thus to develop his autonomy and sense of responsibility.

Case study in an interdisciplinary project

An example of an interdisciplinary project could bring together two teachers, an English teacher and his colleague, a history-geography teacher who intend to offer their

students the possibility of better understanding the historical and social realities of the Anglo-Saxon world, and to establish extensions, comparisons and parallels between certain periods and key movements of British and American civilization.

Some important topics to cover could be: industrial England in the 19th century, slavery and the struggle for civil rights in the United States as well as the impact of American popular culture. This type of activity should be encouraged and developed in order to better weave the coordinated cultural benchmarks of the students, and also to fight against cultural stereotypes, which are still too often present.

The progression of the interdisciplinary sequence is mainly thematic. The interdisciplinary prerequisites assume that learners have the general knowledge and basic skills to question a graphic document, a diagram or a table, to analyse it and make an oral comment on it.

According to Bărbuceanu (2020: 39): „One cannot deny the variety of learning styles existent in a seminar room, such as visual learners - who can profit mostly from the visual aids, kinaesthetic learners and touch learners - who appreciate working with physical objects, tablets, phones or flashcards. The sense of easiness and positivism that lowers anxiety for the students in the seminar room resided in this methodology helps them perform sound, and feel self-assured.”

Interdisciplinary learning allows students to build disciplinary knowledge while consolidating transversal skills. From the teachers’ point of view, this action gave meaning to the team which is no longer defined solely by affinities but by a common project and a common culture based on objectives, on a concrete situation and on educational approaches. It also made possible to achieve the educational objectives initially planned.

The final assessment identified areas of improvement such as a more organized preparation for the implementation of other interdisciplinary projects for subsequent generations. From the students’ point of view, in addition to the interest in discovering a new world and interesting people, this action gave meaning to a certain number of approaches seen in progress: „we see what it really is to conduct a survey”.

It is also an opportunity for them to be independent, to live in a group by taking charge of daily material tasks, to establish different relationships between themselves and with teachers. For students, this type of work is of great interest: they prepare for their future professional life, they are given the opportunity to be useful, they develop a spirit of analysis and synthesis, they learn how to communicate, to be autonomous and know that we trust them and that we count on them.

Students most often request this type of teaching because it offers them an integrated approach to a given subject of study. And in fact, in practice, the vast majority of them are won over by these interdisciplinary courses. The integration of different ways of understanding the same object, and of several methods for studying this object, allows them to grasp the complexity of reality, while acquiring disciplinary reasoning and methods.

The interdisciplinary approach that they experience during group work (whether practical work, guided work, or field projects) is an opportunity for them to establish links or interactions between disciplines usually treated separately. In addition, they appreciate the diversity of the teachers who supervise them, both from a disciplinary and human point of view.

Different ways to integrate curriculum

It is necessary to highlight certain essential conditions for the development of the interdisciplinary curriculum to be considered by teachers. First, we must emphasize the importance of training teachers in the foundations and practical applications of different models of curriculum integration before embarking on the development of interdisciplinary units. Second, the participation of teachers in the development and teaching of interdisciplinary units and the time necessary for the work team meeting are essential to the success of the interdisciplinary experience.

These conditions will encourage the sharing of educational strategies and material resources auspicious for the development of the theme or concept under study. Teachers should use student-centred methods that promote dialogue, discovery, role-playing, grouping of ideas, the ability to state and solve problems. Large group learning and small group work in an interdisciplinary project create a sense of peer group belonging that is essential for work focused on a particular theme or concept. Teamwork, which particularly highlights the collaborative pedagogy and the pedagogy of belonging, contributes to the interactive socialization process fundamental to updated pedagogy.

Fogarty (1991) recognizes that the integrated curriculum is a means used to facilitate the construction of links between subjects on the one hand and with everyday life on the other hand. According to her, the integrated curriculum is an organized and wanted regrouping of a variety of learning experiences from different disciplines.

According to Fogarty (1991: 61-65): there are ten ways to integrate curriculum: the fragmented model, the connected model, the nested model, the sequenced model, the shared model, the webbed model, the threaded model, the integrated model, the immersed model and the networked model. In the fragmented model, the focus is on a single discipline. Relationships between subject areas are only implicitly indicated. In the connected model, the focus is on making explicit connections within each subject area – connecting one topic, one skill, one concept to the next; connecting one day's work, or even one semester's ideas, to the next. In the nested model, the curriculum is seen through three-dimensional glasses, targeting multiple dimensions of a lesson. In the sequenced model, although topics or units are taught separately, they are rearranged and sequenced to provide a broad framework for related concepts. In the shared model, the curriculum is seen through binoculars, bringing two distinct disciplines together into a single focused image. In the webbed model, the curriculum is seen through a telescope, capturing an entire constellation of disciplines at once. In the threaded model, the curriculum is seen through a magnifying glass: the big ideas are enlarged throughout all content with a metacurricular approach. In the integrated model, the curriculum is seen through a kaleidoscope: interdisciplinary topics are rearranged around overlapping concepts and emergent patterns and designs. In the immersed model, the curriculum is seen through a microscope that filters all content through the lens of interest and expertise. In the networked model, the curriculum is seen through a prism, creating multiple dimensions and directions of focus.

Teachers have to put in place the conditions necessary for this learning, to „stage" interdisciplinarity. They have to choose and construct educational situations, while maintaining their disciplinary expertise, an essential factor of interdisciplinarity. Interdisciplinarity involves having at least two reference disciplines and a reciprocal

action between them. This is an important element in the eyes of teachers whose professional identity is defined by the discipline they teach.

Confronted with concrete situations, with professionals, with other learning situations, the student will be able to gradually become autonomous, speak up, gain self-confidence and reinforce or rebuild self-esteem, an essential factor in motivation. The validation of student's productions by third parties (other teachers, professionals, local experts) largely contributes to this self-confidence. So the disciplines, the hours of lessons get a meaning, serve a purpose. The student realizes that he has the tools that he can use in various situations.

Conclusions

Interdisciplinary work can take various forms throughout the training, depending on program requirements, institutional possibilities or teacher's choices. For the successful implementation of interdisciplinary teaching, it is necessary that teachers be prepared to stake on the openness and creativity essential to overcoming the well-established boundaries of disciplinary knowledge and identity.

But this implementation must also be based on genuine institutional will. Finally, we must offer teachers the opportunity to train in these new forms of teaching and learning and give them the means to achieve them.

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