

Renewal of the Teaching-Learning Process in the Bachelor of Sciences of Education at UAEH

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Abstract

The Network of Communities for the Renewal of Teaching - Learning in Higher Education (RECREA) began in 2017 in Mexico with a collaboration between public universities and higher normal schools as a strategy to interact with teachers of both institutions to renew jointly their teaching practices in order to achieve better learning outcomes in students. The project supported by the Secretariat of Public Education of Mexico seeks to promote a culture of collaboration among academics for innovation and improvement of their teaching practices. Taking as a theoretical basis the complex thinking, coined by Edgar Morin, the formation of communities and networks of academics oriented to the innovation of the teaching practices, centered in the learning of the students and in the collective construction of knowledge, is fostered. Following a methodological framework of action research, a monitoring and evaluation plan of the teaching-learning process and its results is established, which allows to relate innovations and the use of ICTs with learning outcomes, to subsequently document and analyze teaching innovation experiences. and its results. Working from tasks or projects that reflect real situations and problems with a complex thinking approach, linking the work of the student with the advances, methodologies and results of research in the disciplinary and professional fields and incorporating the use of ICTs as support tools for academic work and for interaction with and among students, it is possible to form communities of academics to design and share experiences on teaching transformation and innovation, documenting the teaching experience based on a research methodology in the action.

The paper documents the experiences and first results of the research process in a subject, called "Multicultural Mexico" in the case of a Mexican public university participating in the project and analyzes the active and collaborative participation in a community of teachers for the generation of teaching and learning proposals and methodologies for innovative learning.

Keywords: Teaching-learning process; complex thinking; action-research; higher education, teacher communities

1. Introduction

The educational challenges demanded for Higher Education in the 21st century, require the renewal of teaching practices, related to a constant reflection of the educational work in the classrooms. These renewals should allow to expose central problems that in the daily work remain unnoticed, creating a routinely teaching-learning process. Based on the above, epistemological ruptures have been generated that prioritize innovation in the classroom, such as those presented by Edgar Morin (1999), considering the complexity of single aspects in relation to the whole as a fundamental element, in contrast to the paradigm of simplicity in relation to the obedience of the natural order and the relation of complex thinking to interdisciplinarity in opposition to the reality of the world. Other authors such as Porlán and García (2000), creators of the project IRES (School Research and Renewal, Investigación y Renovación Escolar), who consider very important to perform a critical analysis of the social reality at schools for the renovation of pedagogy, through critical training and research for educational change.

In this sense, the Network of Communities for the Renewal of Teaching-Learning in Higher Education (RECREA as acronym for *Red de Comunidades para la Renovación de la Enseñanza –Aprendizaje en Educación Superior* in spanish), which began in 2017 in Mexico, seeks for collaboration between public universities and higher normal schools¹ as a strategy to join teachers and professors of both higher education institutions in interaction to renew their teaching practices together in order to achieve better learning results of their students according to their educational level.

2. Development

2.1 The RECREA -Project

The Autonomous University of the State of Hidalgo (UAEH, Universidad Autónoma del Estado de Hidalgo) is a Public Higher Education Institution, located in the center of Mexico, seeking for quality in educational practices as part of its policies. Particularly it has considered relevant the renovation of teaching practices that link the learning process to significant scenarios and where their graduates fulfill the educational and social demands that today refer to the challenges of the twenty-first century.

In this sense, an emergent problem is visualized in the development of teaching practices, which center their process on the daily and theoretical thinking. Emergent, urgent and recurrent tasks have displaced the fundamental task of the teaching practice, meaning a constant reflection on the context of school, classroom, teaching and learning environments, which allow renovation and innovation in the classroom.

¹ The normal Mexican schools were born in the late nineteenth and early twentieth century, following the French model for the training of teachers dedicated to primary and secondary education. As a consequence of independence, it was necessary to train teachers whose philosophy was in line with that of an independent national life, consolidating the recent nation-state.

Based on the above, some Higher Education Institutions have generated projects that allow the transformation of these scenarios, such as the Network of Communities for the Renewal of Teaching-Learning in Higher Education (Red de Comunidades para la Renovación de la Enseñanza – Aprendizaje en Educación Superior, RECREA) which emerged in 2017, as an initiative of the Department of Higher Education at the Secretary of Public Education, coordinated by the Department of Higher Education for Professionals of Education and the General Office of Higher University Education (Jiménez Lomeli, 2018). It is worth mentioning that this project counts with the participation of seven Normal Schools and seven Public State Universities in Mexico, which are divided by regions: West with the participation of Guadalajara and Nuevo León; Northwest with Monterrey and Chihuahua; Southeast with Veracruz and Tabasco; and Center with Puebla, Hidalgo and State of Mexico. The intention is to generate a collaborative work between teachers of both institutions to jointly renew their teaching practices, which will generate significant learning for their students.

The main objective of the RECREA Project consists in forming communities and academic networks oriented towards the innovation of teaching practices, focused on student learning and the collective construction of knowledge. To achieve the above, it is necessary to promote a culture of collaboration among academics, oriented towards the improvement and innovation of teaching practice, based on the reflection of collegiate groups that exchange successful experiences and areas of improvement in the problems they face on a daily basis in the classrooms from different angles.

The complex thinking, coined by Edgar Morin (2012), is considered as a theoretical basis for the project, as well as the action research that leads to a plan for monitoring and evaluating the teaching-learning process and its results. This allows to relate innovations and the use of Information and Communication Technologies with the results of learning, in order to subsequently document and analyze teaching innovation experiences and their results. It is important that the analysis, reflection, planning and innovation of the educational processes are recovered as driving axes for analysis, from which new and more complex forms of teaching-learning are proposed that develop teaching and learning competencies for both teachers and students.

In the first place and considered as basic for the achievement of the objectives of the project, teachers are required to master the paradigm of complex thinking, which gives them alternatives to reflect and contrast pedagogical and epistemological aspects. The student is visualized as an integral human being, in which a cognitive uncertainty is generated, that takes him to a permanent search of the truth, and in which a critical, reflective and self-critical thinking can be developed.

The complex thinking implies that knowledge is considered as something that is never complete, that means, thought will be articulative, multidimensional and poetic, it is learned and relearned in the uncertainty of knowledge that develops in a spiral in the association dynamics of concepts. Therefore, this way of thinking postulates as most relevant principles a dialogic, recursion and holoscopic approach (Morin, Roger, &

Domingo 2002). Visualizing the educational actors under this conception of complex thinking, it will give them the possibility of approaching and solving problems of the educational reality from an integral and holistic vision. In this sense, it is fundamental to define the concept of complex thinking, which is seen as complexity in terms of the relationship with the whole, in contrast to the paradigm of simplicity in relation to the obedience of the natural order and the relation of complex thought with interdisciplinarity in opposition to the world reality (Morin 1995). Therefore, when talking about complex thinking, it is important to differentiate between "complex" and "complicated", which in many cases are taken as synonyms. But complexity is not a complication, since the second concept is considered as a simple dimension while complexity implies a number of elements, which as Morin, Roger and Domingo (2002) mention is "a framework of events, actions, interactions, feedback, determinations, hazards, which constitute our phenomenal world" (p.37) Therefore, when the complexity is retaken, it would have to refer to a series of conceptions, relationships and interdependencies obtained from a series of knowledge.

In the field of Higher Education, Morin (1999) makes the contribution of the document "The seven necessary knowledge for the education of the future", through UNESCO, where he exposes some central problems that remain completely ignored referring to teaching. He expresses some proposals for an education in terms of durability, public awareness and training for viability. For the RECREA project, complex thinking takes up knowledge as something tangled, in disorder, ambiguous, where the teacher is not the one who delivers knowledge as something already finished, fragmented and simplified, but the student is the one who, starting from the uncertainty and imprecision, articulates, understands and develops his own criticism through a strategic attitude. In addition, the essay is incorporated to identify not only what exists, but also what the student could and should know, in terms of what is required for his formation.

Action-Research in teaching is one of the major challenges that we face in educational institutions. Most teachers are not trained to perform a reflective practice of their daily task, which requires a methodical, regular and instrumental analysis, through intensive and voluntary training. In this sense Perrenoud (2001), considers that teaching practice is a reflective practice, which requires considering professionalization and pedagogical reason. The author proposes a reflective environment and an effort of decentralization and explicitness, through an analytical process of practice, that have as purpose the transformation of identity or mobilization in a dynamic of change. Ramón (2013) on the other hand, highlights the task of re-signifying the teaching practice, from the perspective of the reflective approach, because it gives the opportunity to reconstruct and redirect behavior hardened by routines.

Therefore it is necessary during the training process, the teacher realizes a permanent self-questioning, starting from his performance in the teaching practice, opening his way to action-research, where the significance and resignification of the teaching action in its different roles within the educational institution in a process of circular analysis between theory and practice is constructed (Massé and Juárez 2015). This means the recognition and reflection on the teaching practice itself, followed by the reconstruction and a new implementation in the classroom.

It is essential to introduce and promote the access to renewal in the teaching practice, to favor the professional competences of both teachers and students, focused on the levels of thought from the continuous reflection of the teaching practice in a daily thought, generating critical thinking and opening path to complex thinking, in order to achieve success in the renewal of reflective practice (Tagle 2011). In this sense, if someone wants to renew teaching, he needs a close, permanent relationship between teaching and research in educational processes. According to Jenkins, Healey and Zetter (2007), this link is essential for higher education, which should be built from the academic and disciplinary communities, considering the intellectual development of the student and the identity of the teaching staff, in order to benefit students' experiences and learning outcomes. This supposes an interdisciplinarity in the search and obtaining of new knowledge and its application for the solution of problems inherent to their training field from various methodological and scientific points of view.

It is worth mentioning that in order to improve the active education of the students of Higher Education, teachers must be motivated to achieve autonomous and critical thinking in their students, in order to act accordingly. Therefore, in philosophy it is highlighted that teaching practice doesn't mean only transmission of new knowledge, but the higher level teacher must transmit a way of being creative and doing so and assume that his function is not limited to teaching or transmitting certain content, but to generate open, flexible, critical and self-assessing attitudes.

The purpose of considering this element for the RECREA project is to perceive the way in which research participates in teaching in order to contribute that students receiving a better education with relevant and appropriate learning and knowledge, and to induce a form of learning that awakens creativity, intellectual independence, criticism, innovation and the empowerment of a complex thought within the students. To achieve the above, it is necessary that role of the teacher changes during a permanent reflection and the development of renewed teaching practices, which undoubtedly will require the teacher to be involved in research activities that allow him to think, reflect and make decisions about his educational practices.

The use of Information and Communication Technologies (ICT) are considered "tools, supports and channels that process, store, synthesize, recover and present information in many different ways" (Alcántara 2009, p.2). Nowadays, the use of ICTs contributes to student learning by generating spaces that develop knowledge, skills and aptitudes in relation to creativity, experimentation and manipulation of equipment; improves teaching methods for teachers and help facilitate the work of educational actors through participation and collaboration in virtual communities.

Linking education with technology is relevant because it allows to make better use of resources that are at our disposal, it increases the possibility of communicating and interacting in a horizontal and personalized way, it offers resources and multimedia learning environments and allows easy updating of content and enriches the forms of assessment. Therefore teachers must be able to develop computer skills, to include a didactic use of technology and production of digital resources, among others.

The impact of ICT in society has meant the modification of access and use to training and how to communicate, including communication skills such as speaking and writing, as well as the essential cognitive thinking. The benefit implies that today many people can have access to a world of information and in turn create and establish new social networks.

For the RECREA project, the use of ICT allows students to access information and develop critical thinking, examining, constructing, observing and reconstructing their own learning. It also allows them to exchange information, offer support, socialize and debate in a simultaneous with academic pairs in virtual communities. For the above, the teachers are required to develop the instructional design of their course including the selection, combination, application and monitoring of each of the technologies and monitoring and feedback to students on their learning processes.

This research recovers the RECREA project, which is based on the Van Merriënboer & Kirschner model (2010) who considers ten steps for complex learning, starting with a holistic instructional design integrated by four components that are learning tasks, support information, procedural and practical information on part of the tasks. In the case of Mexico, a strategy that guides the teacher to the continuous reflection of the teaching practice is considered, which finally allows the renewal of their practice.

2.2 The application of the RECREA-Project in a subject of the bachelor program in educational Sciences at UAEH

The Bachelor in Educational Sciences is one of the ten academic programs taught within the Institute of Social Sciences and Humanities (Instituto de Ciencias Sociales y Humanidades, ICSHu) of the Autonomous University of the State of Hidalgo (Universidad Autónoma del Estado de Hidalgo, UAEH). The Honorable University Council of the UAEH approved it in December 2000, and its first generation entered in January 2001. After more than a decade, in September 2014, its curricular redesign was approved, addressing the needs, not only of the state and national development but also on an international level, as well as those of the productive sector, of the service and social sector and of the labor field (UAEH 2014). The new curricula focuses its attention on problems that other careers at other HEIs had not considered, since Hidalgo as so far only had offered degrees that dealt with the training of teachers. The proposal of the UAEH was innovative in the sense that its fundamental objective consisted in entering the broad field of Education Sciences, and professional training based on attention to diversity, reflection and social commitment. The above aliened to the aim of training professionals in Educational Sciences able to analyze and transform the socio-educational context, appropriate the demands of their profession and enter the domain of competent educational practices.

The subject of Multicultural Mexico, is an institutional subject within the curricula of all degrees offered at the Autonomous University of the State of Hidalgo, and being institutional means that all students of all Bachelor's degrees, regardless of the disciplinary area, have to take the course at any time during their program. For this research, the subject is located in the second semester of the Bachelor's Degree in

Educational Sciences, and its main objective points towards the recognition of Mexico as a multicultural, biodiverse and multi-ethnic country, by analyzing the peculiarities and characteristics of its historical process, with a focus critical of the economic, social, political and cultural problems in order to value the richness of the cultural and natural heritage of Mexico (UAEH, Program of subject: Multicultural Mexico, 2014). The program consists of four units that contribute to the following themes:

- Culture: theoretical positions,
- Retrospective vision of multiculturalism,
- Socioeconomic and political problems of ethnic minorities
- Hidalgo: a multicultural state.

For the RECREA project, the intervention was localized in the fourth unit was considered: "Hidalgo: Multicultural State", dealing with the topic of national and foreign migrations (Oriental, Lebanese, English, Jewish). This unit has the purpose that the students can recognize the ethnic groups of Mexico and the state of Hidalgo, to assess the cultural expressions of ethnic groups, as well as to develop and apply intercultural competence for diversity. It should be noted that in the development of this topic the focus was on the renewal of the teaching-learning process, where the mechanisms for achieving a meaningful learning were innovated.

To accomplish the above, the following aspects and steps were developed:

1. Context of the unit of the subject, unit of competence and sub-competences.

It was important to consider the planning of the teaching-learning process in view of the renewal of these processes in the sense of innovation and creativity. The graduation profile was restated, the description of the relation of the subject to the graduation profile and the description of the exit competence of the subject, emphasizing aspects of complexity, research and use of ICT.

The curriculum of the Bachelor of Educational Sciences (UAEH 2014) establishes that the graduate will have a solid socio-humanist formation, the ability to identify, analyze, as well as to transform the economic, political, cultural and social context in which is education is performed. The graduate also will be able to design innovative alternatives, intervene in a creative way in the processes of research, management, evaluation and teaching, among others. Based on the foregoing, it was recognized that the course on Multicultural Mexico retakes knowledge, values and skills that impact the holistic and comprehensive education of students, especially related to the knowledge of indigenous peoples and recognition of diversity. This means, students can recognize Mexico as a multicultural, biodiverse and multi-ethnic country, analyze the peculiarities and characteristics of its historical process, with a critical approach to the economic, social, political and cultural issues in order to value the wealth of the cultural and natural heritage of Mexico. In addition, the units of competence were described and prioritized, among which the recognition of diversity, teacher training and investigative or intervention competence stand out.

2. Tasks / projects of learning, classes of tasks, performance objectives.

In this step it is important to consider learning outcomes aimed at solving complex problems of professional reality. Therefore it is necessary to learn by competencies with tasks and projects that represent different situations and contexts, which means that the learning tasks for the subject were enunciated as well as the different strategies to develop a complex thought, a linkage with the investigation, and use of ICT. Finally the performances for each type of learning task were outlined.

Based on the above, the following tasks were planned with their respective performance objectives: first the students will identify the surnames of foreign origin in Pachuca, then investigate activities and products that foreigners brought to Hidalgo or Pachuca and reconstruct migratory flows, placing them in time so that in the end they deepen into the life history of a family or migrant person.

3. Supporting information (theoretical and strategic), procedural and practical part of the tasks.

This aspect considers the exit competences of the subject and the units of competence that are translated into actions and decisions meant to be carried out to solve the task or project and therefore help to carry out the analysis, the selection of additional information, procedural and practices that are necessary for the content of the course. For this purpose, the following actions, involving the use of ICT and representing an ascending degree of complexity, were proposed:

- search for sources of information (articles, newspapers, historical archive, informal interviews),
- compile the list of foreign surnames,
- relate the surnames with countries of origin and make a list,
- visit to the nearby town of Real del Monte², including a tour in the English cemetery and a visit to the "Paste Museum",
- investigate in historical archive the causes and moments of migration,
- prepare a map with the migratory flows,
- elaborate a timeline indicating the moments of migration,
- identify a family or migrant person and establish the rapport for the interview,
- elaborate an interview script,
- record the interview about the family history and the details of the migration

and finally as a task of greater complexity analyze the data based on causes, process and effect of migration.

4. Scaffolding the homework / learning project.

At this point the mediation that the teacher can offer is important regarding the difficulty of the tasks / projects that are being solved, as well as the supports that he provides to model and facilitate a transit

² Real del Monte is a little silver mining village in the mountains, close to Pachuca, the capital of the state of Hidalgo, where the first english migrants from Cornwall during the XVIII century. Those miners left as part of their cultural heritage a typical Cornish food, the now called pastes (Mexican version of the english word pasty) and of course, the soccer game.

of levels of difficulties. Therefore the motivation must be present with the students in the learning. The students were guided in the realization of the different tasks ranging from the simplest to the more complex, and were asked the following deliverables or products: a field journal, photo album, research cards, world map, timeline, quotation and script for interview, and finally a matrix of migratory aspects or Ishikawa diagram, which involved the development of a complex thinking, where diverse elements, gathered together by the student throughout all the activities, converged.

5. Evaluation of the resolution / execution of the task / learning project.

The evaluation must correspond to the performances expected of the students, so it is necessary to explore methods and instruments of evaluation that provide the evidence to allow the inference if the competition has been achieved. In this sense, several rubrics were elaborated, corresponding to the various products that were asked from the students. Each rubric clearly explained what was expected of each one of them, such as the research competition rubrics, comprehension rubrics and rubrics for the analysis of migratory flow and complexity and finally a rubric on the performance of the use of Technologies.

6. Presentation to the students of the task (s) / project (s) of learning.

It is necessary that the teacher explains and presents the instructional design to the students of the course, so that they know the purposes and sequence that implies the revision of this topic and that goes from the beginning to the end of the teaching - learning process.

3. Conclusion

The implementation of the RECREA methodology in the mentioned example of the learning unit on foreign migrations to the Pachuca region in Hidalgo, Mexico as part of the theme "Hidalgo: multicultural state", left a series of learnings and reflections from both the teachers and the students:

The RECREA methodology means a very close interaction of the teacher with the subject to be taught, that is to say a broad preparation of the instruments, activities and rubrics of evaluation, which implies a considerable investment in time and effort during the preparation of the classes. The instructional design may seem rigid and contradictory with the postulate of complex thinking, which must have a relationship with the context and the uncertainty that exists in it, that is, chaos, and therefore be flexible in its application. This makes the repetition, implementation and application of instructional designs for teachers not trained in the RECREA methodology quite difficult.

Students who participated in the activities and tasks of the learning unit evaluated the activities that they developed in a positive way. They recognized that the fieldwork allowed them to contextualize far better what they had learned previously in class and to value the cultural contributions of other countries and other cultural groups. The students expressed their vision of the experience in the following words: "[...] we learned many things, all this doing field work; since of what we already had been investigated in the Multicultural Mexico class, by going to Real del Monte we confirmed and reaffirmed some things, for

example everything that foreigners left us, of which we appropriated ourselves. So by investigating further we could contextualize many more things, as well as see the impact that migration makes or how it has an impact on the society "(quote taken from student assessment sheets).

In conclusion, the renewal of the teaching and learning process, requires a permanent work of reflection and constant research in the educational process, where traditional paradigms are broken which actually work in schools. But this process is not easy having executing teaching practices that have worked in authoritarian models for a lifetime. In addition collaborative work is required in which the logical signification of the materials that is used throughout the course is recovered, as well as the psychological significance of the material in which the student develop complex thinking. Finally it is necessary to count with a favorable attitude of the student, including emotional and attitudinal dispositions towards learning.

6. Acknowledgement

The research is financed within the RECREA-Project by the PRODEP program of the Mexican Secretary of Education (Secretaría de Educación Pública, SEP)

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