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Publicación original: Díaz-Millón, M., Rivera-Trigueros, I., & Gutiérrez-Artacho, J. (2020). Innovation in Times of Crisis: Online Disruptive Methodologies in the Undergraduate Program of Translation and Interpreting. En *Proceedings of ICERI2020 Conference 9th-10th November 2020* (pp. 259–267). DOI: 10.21125/iceri.2020.0085.

INNOVATION IN TIMES OF CRISIS: ONLINE DISRUPTIVE METHODOLOGIES IN THE UNDERGRADUATE PROGRAM OF TRANSLATION AND INTERPRETING

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Abstract

In the current context of sanitary crisis caused by the COVID-19, a change in the traditional education paradigms has taken place. Thus, due to the lockdown imposed in many countries –among them, Spain– the teaching-learning processes has had to be immediately adapted to an online and distance education context. This situation has led to the emergence of new educational needs at all levels of education, and higher education is not an exception. At the same time, we should not forget that the current labour market is subject to constant changes driven by globalization and the growth of new technologies, and higher education must therefore adapt to these characteristics in order to train its students. It is then necessary to explore new, innovative and disruptive teaching methodologies to meet these needs. In the case of the translation sector, new multifaceted profiles requiring a great domain of new technologies have emerged: localization, post-editing and transcreation.

The main objective of this paper is to explore how disruptive methodologies can be applied to higher education studies in Translation and Interpreting to support distance learning. This main objective is materialized in three specific objectives: SO1) to identify the pedagogical needs demanded by an exceptional context of sanitary crisis and distance education; SO2) to propose and describe disruptive methodologies that are adapted to distance training in Translation and Interpreting, and SO3) to define future lines of work to encourage distance learning through innovative methodologies in Translation and Interpreting.

To this end, first, innovative and disruptive methodologies that can be adapted to distance and online education have been pinpointed. Second, different methodologies specifically targeted to Translation and Interpreting training have been identified. Finally, future lines of work have been outlined to apply these methodologies in the educational field and to design evaluation procedures adapted to the demands of the current sanitary, social and economic context. Our research shows that innovative and disruptive methodologies are applicable to online contexts and are a promising and necessary future line of research.

Keywords: disruptive methodologies, innovation, sanitary crisis, translation and interpreting

1 INTRODUCTION

In the current context of sanitary crisis caused by the COVID-19, a change in the traditional education paradigms has taken place. Thus, due to the lockdown imposed in many countries –among them, Spain– the teaching-learning processes has had to be immediately adapted to an online and distance education context. This situation has led to the emergence of new educational needs at all levels of education, and higher education is not an exception. At the same time, we should not forget that the current labor market is subject to constant changes driven by globalization and the growth of new technologies,

and higher education must therefore adapt to these characteristics in order to train its students.

In the case of the translation sector, new multifaceted profiles requiring a great domain of new technologies have emerged in recent years [1]. This would be the case of post-editors, responsible for revising automatically translated texts, or locators and transcreators, responsible for cultural adaptation and (re)creation of texts. These new profiles are characterized by working with interactive [2] and multimodal texts, in which linguistic elements, images, colors, layout, animations, voice, music, etc. come into play [3]. These are, for example, texts intended for web dissemination.

The training for these new professional profiles faces now a double challenge. On the one hand, due to its novelty, nowadays in Higher Education has not fully incorporate them in the curricula for Translation and Interpreting [4]. So, competences needed for those profiles are often not encouraged not acquired. On the other hand, the training for these profiles also needs to be adapted to the new challenges in education: the paradigm shifts from mostly face-to-face teaching to mostly online teaching produced by the sanitary crisis. It is then necessary to explore new, innovative and disruptive teaching methodologies to meet these needs.

In the field of business and technology, a disruptive innovation means improving a product or service in such a way that it entails something totally unexpected for the market and that often challenges the leading companies in an industry. Disruptive innovations generally offer simple and cheaper alternatives, attracting new customers [5]. Disruptive innovations thus seek to create new markets and value networks, as well as to destabilize rival firms that dominate the existing market [5], [6].

The sudden and disruptive changes produced in the last year by an unprecedented sanitary, social and economic crisis demand now the introduction of disruptive pedagogical methodologies that encourage distance learning or online learning, i.e., learning enhanced by digital and online technologies [7]. The quick shift towards online learning should have been supported by a comprehensive change in the way knowledge is imparted and in its learning, based on technologies [8]. However, teachers, students and education institutions themselves were not fully prepared for this change. In this work, we will present some of the methodologies in which online learning, and specifically online learning for Translation and Interpreting, can be supported.

The main objective of this work is to explore how disruptive methodologies can be applied to higher studies in Translation and Interpreting to encourage distance learning. This main objective is divided into three specific objectives: 1) To identify the pedagogical needs demanded by an exceptional context of sanitary crisis and distance learning; 2) To propose and describe disruptive methodologies that can be adapted to distance training in T&I; and 3) To define future lines of research to encourage distance learning through the use of disruptive methodologies in T&I.

2 METHODOLOGY

In this work, a review of scientific literature has been carried out. Three main topics will be tackled in said review: 1) new disruptive methodologies; 2) new online methodologies adapted to distance learning; and 3) online disruptive methodologies for the undergraduate program in Translation and Interpreting. For the latter topic, new professional profiles will be also considered: post-editing—the editing of segments obtained through automatic translation [9]—, localization—a communicative, technological, textual and cognitive process by which websites are modified for use by

the public around the world other than that initially envisaged [2]— and transcreation — a process by which some parts of the text are translated and others are creatively reinterpreted [10], [11]. All three are characterized by working with interactive and multimodal texts, usually intended for web dissemination. In addition, all three are also characterized by the translation competences needed to carry them out. For example, in-depth knowledge of at least two languages and cultures, mastery of ICTs, creativity, or the use of computer tools, among others [2], [12], [13].

3 RESULTS

3.1 Disruptive methodologies in Higher Education

Disruptive methodologies have recently emerged as a new trend in higher education. Before defining what disruptive methodologies are in higher education, it is necessary to define the concepts of innovation and disruptive innovation, since they cannot be separated. The concept of innovation can be described as the successful exploitation of new ideas [14]. Christensen, et al. [5] differentiate sustaining innovation, understood as an incremental improvement, from disruptive innovation, which is a challenge to what has been previously established. It is this second concept, disruptive innovation, that is most relevant in the context of higher education.

According to Cobo [15], disruptive innovation in education means rethinking and redefining traditional pedagogies. This challenge to established pedagogies may include changing the roles of teacher and student and the relationship between them [16]. According to these authors, the introduction of innovative practices —disruptive methodologies— in education must include an effective use of ICTs to promote cross-curricular competences such as creativity, collaboration, communication and critical thinking. Within innovative practices and disruptive methodologies in education are creative pedagogies. They mean a change of focus, an evolution from traditional pedagogies lacking creativity towards a holistic model of student-centered learning (what is known as heutagogy), which is also collaborative and reflective [15], [17]. Some of the disruptive methodologies that will be explored in this work are: flipped classrooms, peer teaching, cooperative learning or collaborative learning, project-based learning, problem-based learning, experiential learning and competence-based learning. All these methodologies fulfill at least one of the following criteria: they are student-centered pedagogies, they have ICTs as a core element and they promote cross-curricular competences.

Some disruptive methodologies rely on changing the traditional paradigm of teaching. For example, flipped classrooms, whose main strategy is to use formal class time for students to actively participate in the construction of knowledge through interactions with their peers and teachers and, therefore, according to Kong [18], are environments prone to a shift from "teacher-centered" to "student-centered" educational paradigm. The same author points out that flipped classrooms have gained importance due to advances in digital technologies that allow students to have ubiquitous access to resources and connection with their peers. Also in relation to peer-to-peer interaction is peer teaching. It is about learning between two participants of similar age or teaching level and is a method that has been used in a variety of ways for a long time in the area of health and biosciences [19].

Other methodologies that favor interaction and support between equals are all those that have to do with cooperative learning or collaborative learning, i.e. learning models in which all participants must contribute to achieve a shared final result [20]. Authors

such as Severiens & Schmidt [21] and Sung, Chang, & Liu [22] have registered the effects of cooperative learning in undergraduate education, such as increasing students' engagement with their own learning or improving the acquisition of cross-curricular competences such as critical thinking, complex problem solving, creativity and communication. Collaborative learning and cooperative learning, like mobile learning, also rely on the use of mobile technologies to promote learning and the acquisition of skills [22].

In the last decade, other pedagogical approaches based on learning through cooperation have appeared, such as project-based learning and problem-based learning, among others. The main difference between the two is that whereas students in problem-based learning are primarily focused on the process of learning, project-based learning needs to culminate in an end product [20]. Both are methodologies that are being increasingly used in higher education in areas such as engineering due to the growing recognition of the importance of students acquiring professional competencies such as communication, ethics, information literacy, lifelong learning, project management, and teamwork [23]. Project-based learning has also been compared with other pedagogical practices such as experiential learning. The latter is another didactic approach focused on the learning of the individual that has appeared in recent years and seeks to get students to develop skills such as memory, creativity and sensitivity [24].

Gamification is, perhaps, one of the most interesting pedagogical methodologies that have appeared in recent years. It became very popular in marketing strategies and it has been expanded to the educational sphere as it is a resource with a great potential when it comes to encourage specific behaviors as well as increase motivation and engagement as it uses players' natural desire of competition to perform tasks [25], [26]. According to Deterding, Khaled, Lennart, & Dixon, "gamification is the use of game design elements in non-game context" [27]. On his part, Kapp defines gamification as "a careful and considered applications of game thinking to solving problems and encouraging learning using all the elements of games that are appropriate" [28].

The three main elements of gamification are game dynamics, mechanics and components. Dynamics are the global aspects of gamification and are related to satisfying players desires. They include game constraints, emotions, narrative progression and relationships. Mechanics are the processes used to generate player engagement. It is achieved by using challenges and competitions, by providing interaction opportunities with other players such as collaboration or partnership (playing in teams, for example) and including other elements as scoring points, levels or feedback. Finally, the components are the specific instantiations related to dynamics and mechanics, including achievements, gifts or rewards; conquers and progress; avatars, badges and virtual objects; combats or challenges; content unlocking; team formation; and levels, scores and ranking tables [29], [30].

When using gamification in the classroom several aspects should be considered in order to achieve success. Firstly, no student must be obliged to play, gamification should be voluntary. Secondly, the aim of gamification should always be to learn how to solve a problem or task. Finally, there should be a balance between the gamification structure and the student freedom to explore. If gamification is successful it will increase students' motivation, autonomy, competitiveness, cooperation and engagement. In addition, meaningful learning will be achieved [31]. In addition, according to de Freitas [32], pragmatic and randomized trials have confirmed that games can be more effective learning tools than traditional modes. Game-based approaches require cross-

disciplinarity. For this reason, they could be very appropriate to encourage the acquisition of cross-curricular competences.

3.2 Disruptive methodologies for distance learning

Some of the disruptive methodologies that make use of ICT to implement distance learning are: ubiquitous learning, mobile learning, e-learning, computer supported collaborative learning and virtual reality (VR) enhanced online learning. Many of the disruptive methodologies that have appeared in recent decades are based on actively including technology in teaching. For example, ubiquitous learning (or u-learning) refers to learning with mobile devices, thanks to which students can acquire the resources they need to learn anytime and anywhere [16]. This methodology is closely related to mobile learning and e-learning. Mobile learning refers to the use of mobile or wireless devices for the purpose of learning on the move and can be applied at all levels of education, in a classroom or at a distance and also provides transformative innovations for the future of learning [33]. For its part, Sangrà, Vlachopoulos & Cabrera [34] define e-learning as: "(...) an approach to teaching and learning, representing all or part of the educational model applied, that is based on the use of electronic media and devices as tools for improving access to training, communication and interaction and that facilitates the adoption of new ways of understanding and developing learning". The three methodologies, ubiquitous learning, mobile learning and e-learning, involve including the use of ICT and Web 2.0 technologies as learning tools.

Computer Supported Collaborative Learning (CSCL) makes reference to the learning situations in which a small group of students interact, technologies mediating, to solve a complex problem or to design a project [35], [36]. This methodology, closely connected to collaborative learning, poses additional challenges, like achieving a fruitful interaction between students who are not present in the same space [36].

Virtual reality (VR), on its side, is argued to be a way to enhance online education because of its capacity to increase student motivation and engagement and its utility for administering e-learning tools [37]. In education, different VR technologies can be used, like touchpads, controllers or even mobile technologies and can be applied to different domains, from engineering to language learning, and can be useful for acquiring different competences such as problem-solving or communication skills [38].

3.3 Disruptive methodologies in Translation and Interpreting

The main focus of this chapter is to describe the most suitable innovative methodologies aimed at fostering online learning in the undergraduate program of Translation and Interpreting. In the last decade, the field of new teaching methodologies has been explored by many authors from different perspectives. For example, Kiraly [39] explored project-based learning in translation education from a social-constructivist perspective. He proposed that translation teaching based on projects would involve students in authentic work experience that would help them to develop professional skills and competences. Kiraly described a learner-centered methodology that, through collaborative projects, would foster the acquisition of generic (cross-curricular) competences. In fact, some authors [39], [40] proposed a project-based methodology: the simulated project. According to the authors, the simulated project provides learners with a classroom setting with a high degree of authenticity without the stress and time pressure of the real workplace. This methodology, using technologies, could be adapted to a distance learning setting, as it will reproduce an actual professional translation situation: a project carried out with all members involved teleworking [41].

Risku's work [42] follows this very same line of collaborative learning and teamwork. This author describes an exploratory action on situated learning as methodology to foster research skills in translation research training. This teaching action was carried out in the Department of Translation Studies at the University of Graz (Austria), in a seminar course in a master's degree program. The methodology used in this seminar course was situated learning, whose principles, as defined by Risku, are collaboration and construction. She claimed that the "cognitive processes linked to the acquisition of knowledge do not occur solely in the brain but are instead shared with the individual's interaction with others and the environment". That is the reason why, in recent years, there has been a didactic reorientation in translation studies and teamwork and collaborative work, as well as project-based approaches, seem to have a new emphasis in translation education.

Bowker [25] also explored situated learning as a didactic methodology in translation education. She described a learning experience in which situated learning, along with gamification, was introduced in a training context. The aim of the experience was to foster translation skills under time pressure. Students had to face a "real world" situation: to translate a text on a very tight deadline. By offering rewards to students and making the progress visible to other players, gamification helped the students to engage in the tasks. Then, situated learning and gamification seem appropriate methodologies to foster cross-curricular competences in translation training.

In the University of Granada (Spain) a translator training model has been developed: Professional Approach to Translator Training (PATT). This model draws together two approaches to classroom learning previously defined in this work: project-based learning and cooperative/collaborative learning [43]. The PATT model aims to approach the business world of translation through a stimulation of teamwork as if it was a real assignment.

The PATT model is based on the shift from the traditional teacher- and content-centered focus of higher education in Spain to a learner-centered approach and accommodates ICTs and interactive Web 2.0 technology [43]. One of its main aims is to promote teleworking in teams, self-learning and interdisciplinarity. Since the PATT model is a competence-based model, it introduces competences evaluation procedures. Notably, it includes self-evaluation and peer-review, meaning it also includes peer-teaching and experiential learning approaches. Thus, this model applies disruptive methodologies to translator training bearing in mind two core values. First, students are the very builders of their own learning through experience. Second, ICTs must be a key element in the training of students.

Gutiérrez-Artacho & Olvera-Lobo [44] proposed to include gamification in the PATT model. They identified and analyzed the game mechanics which are best adapted to the subjects and competences connected with the Translation and Interpreting undergraduate degree program and concluded that the methodology of videogames —rewarding players in order to monitor their progress— would be effective in keeping students fully motivated. In addition, the PATT model was redesigned and adapted in order to integrate all the knowledge and skills required by the new professional profile of web locators [45], [46]. All these innovative methodologies are focused on translation training as a general professional activity.

Collaborative learning has also proven to be useful in the use of translation (specifically audiovisual translation and audiodescription) in second language learning, as it seems to be a useful tool to promote speaking and writing skills [47], [48]. Also, authors have found it to be a methodology easy to be adapted to online environments [48].

Then, collaborative learning appears again as a successful methodology to implement in the translation classroom.

Online learning in Translation and Interpreting can also be achieved through the use of distance learning methodologies like mobile learning (M-learning). As it has been mentioned previously in this work, M-learning can increase the interaction between students and teachers, and is a way for achieving ubiquitous learning. In the case of translation teaching, it is useful for developing the acquisition of translator competence, as well as other translation-related competences [49].

3.4 Disruptive methodologies for online teaching in Translation and Interpreting

In recent years we have witnessed the unprecedented growth of three professional profiles in Translation and Interpreting: localization, post-editing and transcreation. The common characteristic of these three professional profiles are: 1) they are highly related to technology and web dissemination, and 2) they require the acquisition of cross-curricular competences to be carried out. So, given that innovative didactic methodologies are closely related to the use of new technologies and they are deemed appropriate for the fostering of online learning, it seems accurate to apply new pedagogical methodologies to the training of new professional profiles in translation.

In the following paragraphs, some teaching experiences regarding the use of disruptive methodologies in the training of Translation and Interpreting will be described.

Gutiérrez-Artacho & Olvera-Lobo [45] explored new teaching methodologies for the training of web localizers. With an extended version of the PATT model (see previous section), the authors adapted teaching methodologies like collaborative work, e-learning, self-assessment and peer assessment to web localization training. The extended PATT was applied in the module 'Specialised Translation English to Spanish', specifically in the part focusing on technical/scientific translation in the undergraduate degree program in Translation and Interpreting at the University of Granada. Both students and teaching staff gave a positive final assessment to this learning model. Furthermore, the teaching staff noticed that students acquired certain skills and competences not assessed in the teaching guide for the assignment. While that work had limitations, due to the need for larger-scale empirical validation, it shows great potential as a means of ensuring major enhancements in the quality of the learning experience and introduces disruptive teaching methodologies in the training of new professional profiles in translation.

As for post-editing, different authors such as Nitzke et al. or Yamada have emphasized the importance of training translators in post-editing [13], [50] as it is a common practice in the professional world [51]. However, there is a lack of research on how to apply new pedagogical methodologies to introduce post-editing in translation training.

In the case of transcreation, Morón & Calvo [52] proposed a project-based approach to include transcreation within the undergraduate program in Translation and Interpreting. In their innovative teaching project TeCreaTe, the authors introduced students of the undergraduate program in Translation and Interpreting at the Pablo de Olavide University in Seville (Spain) to transcreation in the marketing sector through simulated projects. Similar to the PATT model mentioned above, authors designed projects under a situated collaborative project approach.

After this short review of innovative teaching experiences, it can be seen how methodologies that gather collaborative and cooperative work, the use of ICTs and e-

learning seem to be appropriate methodologies to enhance online learning for the training of future locators and transcreators. Furthermore, a situated approach has proved to be successful in these experiences (i.e., there is a tendency to replicate real-world professional situations). However, further research will be needed to draw a similar conclusion about post-editing training.

4 CONCLUSIONS

The current context of sanitary, social and economic crisis demands that educators and students adapt to an unpredictable scenario in constant change. Online learning is not a possibility anymore, but a reality. Traditional face-to-face teaching methodologies no longer can fulfill the new educational needs. For the present academic year (2020-21) and maybe subsequent years, settings of 100% online teaching or semi-online teaching in Higher Education are predicted. In this scenario, motivating and engaging students becomes a greater challenge for teachers as in-person interaction is no longer possible. In addition, both, students and teacher may be overwhelmed by spending so much time in front of a computer. For overcoming these barriers traditional education methods –e.g. master classes– need to be revised and adapted to these new circumstances. Therefore, innovative methodologies are in need.

Moreover, virtual scenarios are also gaining popularity in the working field that is the case of Translation and Interpreting, but also other of any other professions. Consequently, it is important for Higher Education to adapt their training to the new characteristics of professional profiles to assure students' employability. In the teaching of translation, past experiences seem to validate the use of e-learning, project-based and situated learning approaches and collaborative/cooperative work approaches. However, further research is in need to explore other methodologies.

In future research directions, it would be of pedagogical interest to apply these methodologies and report its results and its effectiveness, in order to be able to improve them or correct them. In addition, new didactic methods require new evaluation systems. Exploring the design of new evaluation procedures would also be a promising research line.

ACKNOWLEDGEMENTS

This work was supported by the Training Programme for University Teaching Staff FPU17/00667 and FPU18/02698 and the RD&I Project RTI2018.093348.B.I00 (Spanish Ministry of Science, Innovation and Universities), partially funded by the FEDER programme of the European Union and the Spanish State Research Agency (AEI).

REFERENCES

- [1] M.-D. Olvera-Lobo and J. Gutiérrez-Artacho, "Training versus profession: from translation to web localization," in *INTED2017 Proceedings*, Mar. 2017, vol. 1, pp. 5461–5469.
- [2] M. A. Jiménez-Crespo, *Translation and web localization*. Nueva York: Routledge, 2013.
- [3] S. M. Rike, "Bilingual corporate websites-from translation to transcreation?," *The Journal of Specialised Translation*, no. 20, 2013.

- [4] M. Díaz-Millón and M. D. Olvera-Lobo, “La transcreación en Educación Superior. Fortalezas y carencias del Grado en Traducción e Interpretación,” in *Investigación e Innovación Educativa Tendencias y Retos*, I. Aznar Díaz, M. P. Cáceres Reche, J. M. Romero Rodríguez, and J. A. Marín Marín, Eds. Madrid: Dykinson, 2019, pp. 299–314.
- [5] C. M. Christensen, H. Baumann, R. Ruggles, and T. M. Sadtler, “Disruptive innovation for social change,” *Harvard Business Review*, vol. 84, no. 12, pp. 58–65, 2006.
- [6] C. M. Christensen, “Disruptive Innovation,” in *Encyclopedia of Human-Computer Interaction*, 2nd ed., M. Soegaard and R. F. Dam, Eds. Aarhus, 2012.
- [7] R. Lumbreras and W. H. Rupley, “¡Si, se puede! Achieving academic excellence online,” *Distance Education*, vol. 38, no. 3, pp. 381–393, 2017.
- [8] A. Sianes Bautista and E. Sánchez Lissen, “E-learning en 15 días. Retos y renovaciones en la Educación Primaria y Secundaria de la República de Croacia durante la crisis del COVID-19. How have we Introduced distance Learning?,” *Revista Española de Educación Comparada*, no. 36, pp. 181–195, 2020.
- [9] P. Sánchez-Gijón, “La posesición: hacia una definición competencial del perfil y una descripción multidimensional del fenómeno,” 2016.
- [10] V. Gaballo, “Exploring the boundaries of transcreation in specialized translation,” *ESP Across Cultures*, no. 9, pp. 95–113, 2012.
- [11] D. Pedersen, “Exploring the concept of transcreation - transcreation as ‘more than translation’?,” *Cultus: The Journal of Intercultural Mediation and Communication*, vol. 27, pp. 57–71, 2014.
- [12] C. Benetello, “Transcreation as creation of a new original: A Norton™ case study,” in *Creativity in Translation/ Interpretation and Interpreter/Translator Training*, M. De Meo, E. Di Martino, and J. Thornborrow, Eds. 2016, pp. 257–260.
- [13] M. Yamada, “The impact of Google Neural Machine Translation on Post-editing by student translators,” *The Journal of Specialised Translation*, no. 31, pp. 87–106, 2019.
- [14] M. E. del Moral Pérez and L. C. Fernández García, “Videojuegos en las aulas: Implicaciones de una innovación disruptiva para desarrollar las Inteligencias Múltiples,” *Revista Complutense de Educacion*, vol. 26, pp. 97–118, 2015.
- [15] C. Cobo, *La innovación pendiente: reflexiones (y provocaciones) sobre educación, tecnología y conocimiento*. Montevideo: Colección Fundación Ceibal/Debate, 2016.
- [16] K. Burden, M. Kearney, S. Schuck, and T. Hall, “Investigating the use of innovative mobile pedagogies for school-aged students: A systematic literature review,” *Computers and Education*, vol. 138, no. April, pp. 83–100, 2019.
- [17] T. Cochrane, L. Antoneczak, H. Keegan, and V. Narayan, “Riding the wave of BYOD: Developing a framework for creative pedagogies,” *Research in Learning Technology*, vol. 22, no. 1063519, pp. 1–14, 2014.
- [18] S. C. Kong, “Developing information literacy and critical thinking skills through domain knowledge learning in digital classrooms: An experience of practicing flipped classroom strategy,” *Computers and Education*, vol. 78, pp. 160–173,

2014.

- [19] D. J. R. Evans and T. Cuffe, "Near-peer teaching in anatomy: An approach for deeper learning," *Anatomical Sciences Education*, vol. 2, no. 5, pp. 227–233, 2009.
- [20] D. Kokotsaki, V. Menzies, and A. Wiggins, "Project-based learning: A review of the literature," *Improving Schools*, vol. 19, no. 3, pp. 267–277, 2016.
- [21] S. E. Severiens and H. G. Schmidt, "Academic and social integration and study progress in problem based learning," *Higher Education*, vol. 58, no. 1, pp. 59–69, 2009.
- [22] Y. T. Sung, K. E. Chang, and T. C. Liu, "The effects of integrating mobile devices with teaching and learning on students' learning performance: A meta-analysis and research synthesis," *Computers and Education*, vol. 94, pp. 252–275, 2016.
- [23] K. D. Beddoes, B. K. Jesiek, and M. Borrego, "Identifying Opportunities for Collaborations in International Engineering Education Research on Problem- and Project-Based Learning," *Interdisciplinary Journal of Problem-Based Learning*, vol. 4, no. 2, pp. 9–19, 2010.
- [24] D. Efstratia, "Experiential Education through Project Based Learning," *Procedia - Social and Behavioral Sciences*, vol. 152, pp. 1256–1260, 2014.
- [25] L. Bowker, "The Need for Speed! Experimenting with 'Speed Training' in the Scientific/Technical Translation Classroom," *Meta*, vol. 61, pp. 22–36, 2016.
- [26] W. H.-Y. Huang and D. Soman, *A Practitioner's Guide To Gamification Of Education*. Toronto: Rotman School of Management, 2013.
- [27] S. Deterding, R. Khaled, N. Lennart, and D. Dixon, "Gamification: Toward a Definition," in *CHI 2011 Gamification Workshop Proceedings*, 2011.
- [28] K. M. Kapp, *The gamification of learning and instruction : game-based methods and strategies for training and education*. Pfeiffer, 2012.
- [29] E. Herranz, "Gamification." Universidad Carlos III: I Feria Informática, Madrid, 2013.
- [30] K. Werbach and D. Hunter, *The gamification toolkit : dynamics, mechanics, and components for the win*. Wharton Digital Press, 2015.
- [31] O. Borrás Gené, "Fundamentos de la gamificación." Universidad Politécnica de Madrid, Madrid, 2015, Accessed: Jun. 30, 2020. [Online]. Available: [http://oa.upm.es/35517/1/fundamentos de la gamificacion_v1_1.pdf](http://oa.upm.es/35517/1/fundamentos%20de%20la%20gamificacion_v1_1.pdf).
- [32] S. de Freitas, "Are games effective learning tools? A review of educational games," *Journal of Educational Technology & Society*, vol. 21, no. 2, pp. 74–84, 2018.
- [33] Y. Park, "A pedagogical framework for mobile learning: Categorizing educational applications of mobile technologies into four types," *International Review of Research in Open and Distance Learning*, vol. 12, no. 2, pp. 78–102, 2011.
- [34] A. Sangrà, D. Vlachopoulos, and N. Cabrera, "Building an inclusive definition of e-learning: An approach to the conceptual framework," *International Review of Research in Open and Distance Learning*, vol. 13, no. 2, pp. 145–159, 2012.
- [35] D. W. Johnson, R. T. Johnson, and M. B. Stanne, *Cooperative Learning Methods: A Meta-Analysis*. Minneapolis: University of Minnesota, 2000.

- [36] N. Hernández-Sellés, P.-C. Muñoz-Carril, and M. González-Sanmamed, "Interaction in computer supported collaborative learning: an analysis of the implementation phase," *International Journal of Educational Technology in Higher Education*, vol. 17, no. 23, 2020.
- [37] G. Makransky and L. Lilleholt, "A structural equation modeling investigation of the emotional value of immersive virtual reality in education," *Educational Technology Research and Development*, vol. 66, no. 5, pp. 1141–1164, 2018.
- [38] J. Radianti, T. A. Majchrzak, J. Fromm, and I. Wohlgenannt, "A systematic review of immersive virtual reality applications for higher education: Design elements, lessons learned, and research agenda," *Computers and Education*, vol. 147, no. July 2019, p. 103778, 2020.
- [39] D. Kiraly, "Growing a Project-Based Translation Pedagogy: A Fractal Perspective," *Meta*, vol. 57, no. 1, pp. 82–95, 2012.
- [40] S. Hansen-Schirra, S. Hofmann, and J. Nitzke, "Acquisition of Generic Competencies Through Project Simulation in Translation Studies," in *Positive Learning in the Age of Information. A Blessing or a Curse?*, O. Zlatkin-Troitschanskaia, G. Wittum, and A. Dengel, Eds. Springer VS, 2018, pp. 267–280.
- [41] M.-D. Olvera-Lobo, "Teleworking and collaborative work environments in translation training," *Babel Revue internationale de la traduction / International Journal of Translation*, vol. 55, no. 2, pp. 165–180, 2009.
- [42] H. Risku, "Situated learning in translation research training: Academic research as a reflection of practice," *Interpreter and Translator Trainer*, vol. 10, no. 1, pp. 12–28, 2016.
- [43] B. J. Robinson, M.-D. Olvera-Lobo, and J. Gutiérrez-Artacho, "After Bologna: Learner- and competence-centred translator training for 'digital natives,'" in *From the Lab to the Classroom and Back Again: Perspectives on Translation and Interpreting Training. New Trends in Translation Studies Series*, Frankfurt am Main: Peter Lang, 2016, pp. 325–359.
- [44] J. Gutiérrez-Artacho and M.-D. Olvera-Lobo, "Gamification in the Translation and Interpreting degree: A new methodological perspective in the classroom," in *EDULEARN16 Proceedings: 8th International Conference on Education and New Learning Technologies*, L. Gómez Chova, A. López Martínez, and I. Candel Torres, Eds. Valencia: Iated Academy, 2016, pp. 50–58.
- [45] J. Gutiérrez-Artacho and M.-D. Olvera-Lobo, "Teaching methodologies for new professional profiles in the translation market: web locators," in *ICERI2016 Proceedings: 9th annual International Conference of Education, Research and Innovation*, L. Gómez Chova, A. López Martínez, and I. Candel Torres, Eds. Valencia: IATED Academy, 2016, pp. 3384–3392.
- [46] J. Gutiérrez-Artacho, M.-D. Olvera-Lobo, and I. Rivera-Trigueros, "Competencia comunicativa y nuevas tecnologías en el proceso de localización web: Modelo MDPT para la formación de profesionales en localización," *Revista Fuentes*, vol. 21, no. 1, pp. 73–84, 2019.
- [47] N. Talaván, A. Ibáñez, and E. Bárcena, "Exploring collaborative reverse subtitling for the enhancement of written production activities in English as a second language," *ReCALL*, vol. 29, no. 1, pp. 39–58, 2016.

- [48] N. Talaván and J. Lertola, “Active audiodescription to promote speaking skills in online environments,” *Sintagma*, vol. 28, pp. 59–74, 2016.
- [49] Z. Shi and G. Luo, “Application of WeChat Teaching Platform in Interactive Translation Teaching,” *International Journal of Emerging Technologies in Learning*, vol. 11, no. 9, pp. 71–75, 2016.
- [50] J. Nitzke, S. Hansen-Schirra, and C. Canfora, “Risk management and post-editing competence,” *The Journal of Specialised Translation*, no. 31, pp. 239–259, 2019.
- [51] B. Rodríguez de Céspedes, “Beyond the margins of academic education: identifying translation industry training practices through action research,” *The International Journal for Translation & Interpreting*, vol. 12, no. 1, pp. 115–126, 2020.
- [52] M. Morón and E. Calvo, “Introducing transcreation skills in translator training contexts: A situated project-based approach,” *The Journal of Specialised Translation*, no 29, pp. 126-148, 2018.