Paper Universitario

DESIGN-BASED RESEARCH IN HIGHER EDUCATION IN ECUADOR
(LA INVESTIGACIÓN BASADA EN EL DISEÑO EN LA UNIVERSIDAD ECUATORIANA)

AUTOR

Jorge Balladares Burgos,
docente del Área de Educación,
Universidad Andina Simón Bolívar, Sede Ecuador

Quito, 2025

EDeR

Educational Design Research

Volume 9 | Special Issue 1 | 2025 | Article 75

Contribution Academic Article

Title **Design-Based Research in Higher Education in Ecuador**

Author **Jorge Balladares**
Universidad Andina Simon Bolivar
Ecuador

Abstract Higher education in Ecuador is facing new challenges related to improving the quality of teaching and innovation in students´ learning. One of the challenges involves integrating research with teaching activities, academic management, and community engagement. The Design-Based Research (DBR) approach becomes key and strategic for effective education. It allows teaching staff to join an interdisciplinary team and influence their immediate context to improve their teaching practice, ensure the quality of the curriculum design, and develop contextualized theories about the educational process. The review will focus on academic manuscripts of Design-Based Research generated by Ecuadorian researchers. These will be sourced from repositories of Ecuadorian universities within the last six years. In this way, it is proposed that Design-Based Research provides the fundamental epistemological and methodological horizons for faculties to integrate research with curriculum design and teaching practice. Thus, educational research will be more concrete and applicable in the immediate teaching contexts for their improvement and innovation, and in turn, the practice itself will reformulate the theory that underpins educational action.

Keywords Design-based research
higher education
teaching practice
teaching professional development.

DOI dx.doi.org/10.15460/eder.9.1.2145

Citation Balladares, J. (2025) Design-Based Research in Higher Education in Ecuador. *EDeR – Educational Design Research*, 9(1), 1-19. http://dx.doi.org/10.15460/eder.9.1.2145

Design-Based Research in Higher Education in Ecuador

Jorge Balladares

1.0 Introduction

Higher education in Ecuador has faced some problems in the last decade. One of the difficulties faced by faculties in the last years is that their working hours were almost entirely dedicated to teaching, with little time for research and outreach. This reality also reflects the lack of research training programs among higher education faculties. Attempts to participate in research projects and publish in scientific journals were sporadic, so research looked at itself as a utopia, a difficult ideal to achieve for teaching professional development. Knowledge as a business, private universities over public universities, and the lack of professional development of university faculties, among other factors, are some of the reasons why research was not considered a priority at Ecuadorian universities for many years (Quirola, 2010; Ramírez, 2016; Quindemil et al., 2017).

One of the causes of the distinction between university and industry is the limited effectiveness of teaching training programs and courses for developing research competencies among faculties in Ecuador. University staff members perceive a certain dissatisfaction regarding the quality of teaching and research processes in their teaching practice. Teaching professional development faces new educational challenges that respond to labor's demands. Among these challenges, the incorporation of research skills that impact the scientific nature of knowledge and the improvement of teaching practices, both inside and outside the classroom, in the face of new generations of students need to be promoted (Pérez, 2010; Cobo & Moravec, 2011; Balladares, 2018). University faculties are at a crossroads, needing to develop research skills to enhance their teaching methods and techniques. In an Ecuadorian context, research in higher education has failed. Many students graduate from universities without solid research experience (Boyer, 1990; Huggins et al., 2007).

Nevertheless, science, technology, innovation, and knowledge are fundamental pillars for the transformation of the Ecuadorian university. This transition of the university in society is based on the universal right to education, the National Plan for Good Living, the new Organic Law of Higher Education (LOES, 2018), and local and regional initiatives for a new type of just, democratic, and nature-integrated society (Quirola, 2010). Ecuadorian universities are encountering new demands concerning the enhancement of teaching quality and fostering innovation within higher education. One significant challenge involves linking research endeavors with teaching responsibilities, academic administration, and community involvement (Balladares, 2021a).

The integration of research with the primary functions of teaching in higher education needs the application of the Design-Based Research (DBR) approach, which emerges as pivotal and strategic for seamless integration. Design-Based Research empowers professors to collaborate with interdisciplinary teams, influencing their immediate environment to refine teaching methods, ensure the excellence of curriculum design, and cultivate localized theories pertaining to educational processes. Furthermore, this research approach advocates for the advancement of knowledge regarding instructional design and the cultivation of inventive teaching methodologies (Balladares et al., 2019).

Design-Based Research offers essential epistemological and methodological frameworks for university staff in higher education to merge research with curriculum design and teaching methods. Consequently, educational research becomes more tangible and relevant within the immediate environments of professors, facilitating their enhancement and innovation. In return, this practice reshapes the theory underlying educational practices (Díaz, 2019; Balladares, 2018). Therefore, the integration of research into the work of university professors aims to improve the quality of the teaching and learning process in the classroom in search of excellence, innovation, and relevance. In this sense, it is important to consider that teacher education programs for university professors incorporate the development of research competencies, and Design-Based Research should be considered an alternative approach for the development of research competencies in teacher training, as a type of research that starts from the teacher's own context and reality (Valverde, 2016).

Design-Based Research focuses on the creation and exploration of various innovations with the purpose of integrating theory into educational practice. Design-Based Research aims to reduce uncertainty in decision-making and the design of educational interventions. This approach is based on a comprehensive understanding of learning (Crosetti & Salinas, 2016). Academics such as Collins et al. (2004) proposed that design experiments are oriented towards achieving a balance between the development of solid theories and the practical applicability of educational research. Design-Based Research produces two types of results, both practical and concrete, as well as abstract. In this way, certain elements are taken into account, such as analysis and exploration, design and construction, and finally, evaluation and reflection (Armstrong et al., 2020). One of the fundamental aspects of Design-Based Research is that its findings enable improvements to ensure that design and research mutually enrich educational practice (Rinaudo & Donolo, 2010).

Design-Based Research combines design with research and practice. This research approach is based on teaching and learning and it mixes multiple research designs and methodologies, creating a hybrid research methodology. Design-Based Research can be defined as a systematic and flexible approach that seeks to improve educational practices through analysis, design development, and implementation. It is based on collaboration between researchers and practitioners in a specific context and leads to contextualized design principles and theories (Wang & Hannafin, 2005).

A few of its aims encompass overarching goals for learning environments and the evolution of learning theories. Design-Based Research unfolds through iterative cycles of learning, analysis, and refinement. Moreover, investigations into designs should yield common theories that facilitate conveying pertinent insights to educators and researchers alike. Consequently, research ought to assess the functionality of the design, not solely concentrating on its shortcomings but also examining its interactions. Among other goals that this emerging paradigm can offer for research in educational technology are the following: exploring new learning environments; developing context-specific theories about the teaching-learning process; building knowledge about design; and enhancing human capacity for innovation (The Design-Based Research Collective, 2003).

Wang & Hannafin (2005) mention the following attributes of Design-Based Research:

- Pragmatic research goal: Design-Based Research emphasizes the collaboration between practical application and research, advancing the enhancement of practice. According to this approach, research should aim to enhance both theory and practice concurrently. The significance of theory will be determined by its effectiveness in guiding and enhancing practical application.
- Grounding research methodology: Design-Based Research is conducted in real-life environment and world contexts. Researchers use literature reviews and available design cases for identifying gaps to ensure research's significance.
- Interactive, iterative and flexible research process: Design-Based Research is defined by iterative cycles of design, implementation, analysis and re-design. Based on this iterative cycle, a theory will evolve and be refined through the data collection and practical experiences.
- Integrative research methods: Different methods are integrated to maximize research credibility and adaptability. Mixed methods, retrospective analysis and formative evaluation are methods considered by Design-Based Research.
- Contextual research results: Research is embedded in a specific environment and its needs. The research procedure, its discoveries, and any change from the initial plan are documented (Wang & Hannafin, 2005).

It is worth noting that another characteristic of Design-Based Research is that it places educational research in the natural context where the studied phenomena occur, producing specific changes in the studied context. It promotes the use of systemic approaches, treating variables as interdependent (Wang & Hannafin, 2005). Design-Based Research is a field study that intervenes in a specific learning context through instructional design, achieving a defined pedagogical goal. Research of this kind generates knowledge that contributes to improving the quality of instructional design and practices at different levels, contexts, and disciplinary areas (Gibelli, 2014).

Design-Based Research could be specific in a particular educational or institutional context (Wang & Hannafin, 2005). It should be noted that educational research in university teaching is not limited to the individual dimension of teacher performance but also includes the cultural, political, and social dimensions of educational institutions (Giménez, 2016). These problems arise in specific educational environments and contexts. It can be stated that this type of research analyzes educational situations and seeks solutions to improve them, generating knowledge that contributes to improving teaching practices (Gibelli, 2014).

This is where the importance of promoting educational research lies, as proposed by Design-Based Research, as it allows for the identification of variables, improvement of previously implemented designs, and the investigation and analysis of educational issues (Balladares, 2018). In other words, Design-Based Research seeks results that drive improvements in educational programs, merging design, research, and practice to achieve excellence and to learn from successes and failures in educational innovation. Design-Based Research could contribute to the developing of research competencies for Ecuadorian teaching staff due to its research approach based on pedagogical design, teaching and learning process, and educational context. Continuous professional development in education is increasingly crucial due to emerging technologies. Educators must adopt three roles: learners, designers, and researchers. However, digital competence is fundamental. Often, technological training focuses on skills rather than pedagogy (Ribadeneira et al., 2022).

Based on a literature review, the aim of this article is to identify the academic manuscripts of Design-Based Research generated by Ecuadorian researchers and studies conducted in Ecuadorian educational contexts in different sources of information for analyzing the evolution of Design-Based Research in higher education in Ecuador. Actually, universities need to expand their academic programs and provide open access to new students to meet the demands of the job market. However, universities also face knowledge-based business that emphasize the immediate development of job-related skills that professionals need to respond to the knowledge society. Consequently, graduates question the benefits of a university education compared to what new knowledge industries offer for their professional development. It is important for universities to incorporate research and the development of research skills into their educational process to answer labor demands (Laurillard, 2002). The research question of this article is the following: Is Design-Based Research (DBR) well known as a research approach in Ecuador?

2.0 Methodology

This article proposes a literature review of academic manuscripts of Design-Based Research generated by Ecuadorian researchers and studies conducted in Ecuadorian higher education contexts. The following research question arise: Is Design-Based Research (DBR) well-known as a research approach in Ecuador? Scientific articles on Design-Based Research in Ecuadorian higher education (20) were re-

viewed in the period 2017-2023 in specialized journals and repositories of universities. Eleven articles (11) were selected that focused on the following keywords: Design-Based Research & Higher Education & Ecuador. Nine articles (9) were excluded because any of them focused the three keywords used as criteria for choosing the articles.

Regarding the search procedure and selection criteria for the bibliography of the present research, sources both in English and Spanish languages were explored. ERIC, Google Scholar and CrossRef were used for English sources. Google Académico, Dialnet and Redalyc were utilized for Spanish literature. This research used 10 out of 74 repositories of Ecuadorian universities that have Education Faculties. The criteria used for the 10 repositories was that those repositories belong to universities that has graduate and undergraduate programs; the other 64 has only undergraduate programs.

This research used the following keywords for the selection criteria of sources:

- Design-Based Resarch in English language. Investigación basada en el diseño, estudios del diseño, investigación en diseño educativo, in Spanish language.
- Higher education and university in English language. Educación superior, universidad, in Spanish language.
- Ecuador and Ecuadorian in English language. Ecuador, ecuatoriano, ecuatoriana, in Spanish language.

The methodology used for data analysis in this study involved a systematic literature review of academic manuscripts focusing on Design-Based Research (DBR) within the context of Ecuadorian higher education. Besides, there were key aspects analyzed in the literature reviews. First, the prevalence and recognition of DBR as a research approach in Ecuadorian higher education were assessed; it included identifying how frequently DBR methodologies were employed and how well-known this approach is among Ecuadorian researchers. Second, the selection criteria ensured that the studies specifically addressed the intersection of DBR, higher education, and the Ecuadorian context, thereby providing a focused examination of how DBR is applied within this specific educational setting. The sources were also scrutinized for language, ensuring a comprehensive review of relevant literature in both English and Spanish.

3.0 Results

Research is a fundamental part of educational praxis; that is why the higher education policy in Ecuador mentions it as part of the teacher's activities. There is prior research on the use of this methodology in universities, which is why research and analysis of different postgraduate works on Design-Based Research were conducted in various universities in Ecuador. The goal was to gain clarity on the applicability of this design type in the Ecuadorian context. It is important to mention that this type of research approach is applied in various institutions worldwide. In the context of Ecuador, there is a limited amount of

research on this approach. In order to present the results of this research, the name of the university and its research will be mentioned.

As a background, the university staff from the University of Milagro (Universidad Estatal de Milagro -UNEMI) carried out a research project that focused on the challenges facing higher education and the constant evolution of this field. During this study, the Research-Based Learning (RBL) strategy was introduced as a response to establishing solid foundations for a research-based, practical, and pedagogical approach. This initiative aimed to demonstrate the relationship between increased scientific production by teaching staff and the implementation of the Research-Based Learning (RBL) educational methodology within the educational environment of UNEMI. The research results indicated a positive and significant correlation between teachers who shared their research in classes and the use of scientific information from Google Scholar, Redalyc, and other journals. It is noteworthy that the information for this study was provided by UNEMI's Research Department, where the measurement instrument used was the RBL Questionnaire, designed and field-validated by the authors, as well as the limited information on this type of methodology. Finally, the results showed a significant increase in scientific production by UNEMI teachers, exceeding 25% between 2013 and 2015. This percentage reinforces the importance of the teacher's role in implementing methodologies that promote research, as there is a connection between teachers who use their research in their classes and students who make greater use of scientific resources in their academic work (Espinel et al., 2017). Even though this research did not focus on Design-Based Research, it showed a background of this approach by mentioning Research-Based Learning as an educational methodology that joins research, methodology and pedagogy.

Andean University Simon Bolivar (Universidad Andina Simón Bolívar – UASB) was forced to take emergency measures in response to the pandemics. Several challenges were identified, such as teaching online and the use of digital resources. In other words, instructional design allowed for constant questioning of the use of design and technologies to improve education in a technological society. This model allowed for contextualization of educational needs in order to seek strategies that help planned activities meet instructional needs, consisting of elements such as: a) teachers, b) participants, c) learning environments, d) strategies, and e) learning materials that continuously interact with students to achieve their goals.

In the Andean University, challenges such as creating distance studies, students and teachers developing digital competencies, offering open and continuous academic programs, and incorporating students from the country, the Andean region, and internationally were presented. Within the guidelines adopted by the university to maintain its academic activities, motivation of teachers to be creative and supportive was promoted. For this reason, they were forced to consider various alternative approaches, such as developing digital skills in both students and teachers, researching learning environment design, and improving infrastructure (Jaramillo et al., 2020).

The Andean University was analyzed through a case study that examined the techno-pedagogical design process in the Education Area in the Andean University Simon Bolivar learning management system (LMS). According to Chicaiza (2023), the research had three objectives:

- To identify the components of techno-pedagogical design in the development of a training action.
- To identify the components of techno-pedagogical design through the practices of using virtual classroom resources.
- To establish guidelines to guide techno-pedagogical design practices in a virtual learning environment (EVA).

The research's main guideline is to understand how pedagogical design is constructed in a subject in the LMS. Regarding the design applied by the university, various aspects were considered, such as objectives, goals, content relationships, and activities. Likewise, for development, aspects such as resources, strategies, assessment, and teacher presence were planned. Finally, the implementation and evaluation phase were carried out. Categories and indicators were determined to collect information about design practices in a virtual classroom, using an ad hoc instrument that identified common design practices and differentiating elements based on instructional design models discussed in theory.

After obtaining the results, the case study reveals the following information:

- Context Analysis has a participation of only 21%.
- Objectives Definition, 100% of them are fulfilled.
- Resources Used, 80% of classrooms use textual format resources from external authorship to the teacher.
- Learning Strategies, with an individual focus, account for 83%, while collective learning strategies account for 50%.
- Evaluation showed that 92% of the strategies include assessment systems, mainly hetero-evaluation and direct grading.
- Teacher Presence, 63% of classroom types integrate teacher presence, but interaction with students in terms of motivation and feedback is limited.

In summary, the technological-pedagogical design carried out by Chicaiza (2023) determines that teachers with limited student participation primarily lead it. Furthermore, there is a lack of consideration for the contextual needs of students during the design process. Despite the possibilities offered by the virtual learning environment, the effective application of elements such as feedback and interaction proves to be limited in the evaluated virtual classrooms. In this study, the conclusions indicate that it is essential to consider that the effectiveness of technological resources plays an essential role in the educational process. However, this effectiveness is closely linked to the implementation of appropriate pedagogical practices that foster con-

ceptual understanding, skill development, and active knowledge construction among students and teachers.

A graduate study analyzes the impact of digital education on teacher training in e-learning and blended learning modalities. Three studies were conducted for this purpose. It focused on the impact of a blended ICT training course on the digital competence of university professors in an Ecuadorian university. Then, this research identified the key components of instructional design for a postgraduate program in the e-learning modality at a Spanish university using Design-Based Research. Meanwhile, the third study proposed an instructional redesign of a digital education course aimed at developing digital and information competencies for Ecuadorian university professors. The results of the studies demonstrate that the instructional design of training courses does not meet the needs and expectations regarding digital competence, and there is no improvement in ICT practices in the classroom. The analyzed postgraduate program is considered a valid, innovative, and up-to-date proposal for the training of professionals and researchers in Educational Technology, and the design of activities is crucial for promoting deep learning in e-learning. The instructional redesign based on the results of the previous studies contributes to the quality of digital teacher training. These three studies provide a comprehensive view of the research results concerning digital education and teacher training in the b-learning and e-learning modalities (Balladares, 2021a). In the case of the Andean University, the Design-Based Research approach focused on the new e-learning and b-learning program designs for improving them and for a better understanding of these learning modalities.

Heredia-Jimenez et al. (2023) proposed a study about student dropout and retention as a major concern in higher education institutions in Ecuador (HEIs). HEIs use the benefits of Learning Analytics (LA) dashboards to address this concern by monitoring students' academic progress and identify students at risk. This study adds to the existing body of knowledge, the experience of designing, implementing, and evaluating a dropout and retention dashboard embedded in an academic counseling system. With a Design-Based Research (DBR) approach, the researchers show the process of going from the needs analysis level, through three iterations to test and evaluate the dashboard, to end with preliminary design principles. The lessons learned serve as a guide for Learning Analytics designers in the implementation of such dashboards. The results of this research were presented at the Ninth International Conference on eDemocracy & eGovernment (ICEDEG) held in Quito, Ecuador.

Pandemics promoted the research about educational technology, distance learning, remote learning, teaching online, e-learning and blended learning. Balladares (2021b) led a study on perceptions surrounding remote education and blended education in higher education in Ecuador. A case study of a graduate university program is framed within the Design-Based Research approach to analyze perceptions of remote education during the pandemic and identify key success factors for a new educational normalcy based on the microcycles of the implementation phase. Among the findings, it is recognized that remote education responded to the pandemic emergency,

and key success factors were identified, such as the timing of teaching and learning processes, synchronous online teaching, the technological-pedagogical design of virtual learning environments and learning management systems, and university digital transformation. These results allow for a reevaluation of the traditional concept of blended learning by incorporating the strengths of remote education and repositioning it as a strategic mode of study for a new educational normalcy that gradually reintroduces in-person learning and expands student learning. This research contributes to generating insights from blended education toward a renewed post-pandemic education.

Design-Based Research is very important for educational research and educational technology research (EduTech) in higher education in Ecuador. Even if new methodological strategies are adopted for conducting research in the classroom, it is important to include an epistemological perspective that guides educational research. Therefore, the Design-Based Research paradigm (DBR) is proposed as the focus for educational research. The Design-Based Research paradigm combines the instructional or pedagogical design of a program or course with research and practice. This research paradigm helps explain how educational innovations work in practice, such as the integration of ICT in teaching and learning processes. Design-Based Research allows researchers to be part of an interdisciplinary team and have an impact on their immediate context. Therefore, this approach seeks to generate innovations in local contexts (Balladares, 2018).

The Pontifical Catholic University in Ecuador (Pontificia Universidad Católica del Ecuador – PUCE) financed the research about the impact of mobile learning (m-learning) in the classroom. The purpose of this study is to conduct a study on the use of tablets and their impact on the mobile digital learning of students in General Basic Education (EGB). Through a case study at a public school and its integration with educational technology, an analysis is performed on the influence of mobile technological mediation on students' digital learning. The case study is complemented by the Design-Based Research approach, which takes an instructional design approach to the mobile digital classroom and identifies key elements to enhance mobile education processes. The results of this study aim to improve the integration of tablets to ensure the quality of learning, enhance academic performance, and promote inclusive education to guarantee students' access to technology and reduce the digital divide (Balladares et al., 2019).

There is some graduate research shown as thesis at university repositories. Campaña (2023) proposed some research that collaboratively generates, with a group of students from the central highlands of Ecuador, a methodological proposal that goes beyond theoretical and technical approaches to philosophy and advocates for a practical philosophy approach in high school. To achieve this, a Design-Based Research was conducted. The methodological approach employed aimed to promote dialogue, questioning, and reflection on the national curriculum to stimulate analytical, critical, negotiation, and appropriation skills. The collaboratively designed methodology adopts an existential philosophy approach that encourages students to deconstruct their ways of understanding and interpreting reality, reflect on themselves,

and work on their modes of existence. The initiative promotes the development of an ethical and aesthetic rationality to shape their subjectivity through autonomous thinking and self-awareness. Other noteworthy results include the creation of conditions for students to experience the social role of philosophy: challenging power dynamics through critical attitudes toward established norms, and enhancing their agency to influence their educational system (Campaña, 2023).

Secondly, a thesis by Díaz (2019) is reviewed, which addresses the applicability of Design-Based Research to a group of students in the Calculus I course at the Faculty of Philosophy, Literature, and Education Sciences, School of Exact Sciences, Computer Science Career, at the Ecuadorian Central University (Universidad Central del Ecuador – UCE). A non-experimental ex post-facto research model, meaning 'after the fact,' was applied in this study. This model demonstrated the effectiveness of using Design-Based Research by comparing two experimental groups evaluated differently. One group was evaluated using traditional methodology, while the other group was evaluated using Design-Based Research methodology, and the latter achieved better results. This thesis demonstrates how a restructuring of classroom teaching design, even in complex subjects, can lead to improvements in student assessment. Design-Based Research opens up possibilities for the varied use of new learning methods in the classroom, as was the case in determining different strategies at the elaboration, organization, understanding, and support levels, with each contributing to better student assessment with the support of ICT, programs like Geogebra and Graph. The course was planned for seven class sessions, which corresponded to various criteria such as the session number, objectives, basic concepts, and representation systems (26). As the final conclusions of the research work, it was determined that after the application of the post-test, there was a significant increase in assessment results, suggesting improvement in learning through the use of questionnaires, surveys, metacognitive journals, and virtual environment activity logs.

This literature review found that there are researchers from other countries that published articles in Ecuadorian journals about Design-Based Research. This is the case of the study by Ferreira et al. (2017) published in the scientific journal of Saint Gregorius University in Portoviejo (Universidad San Gregorio de Portoviejo – USGP). The purpose of this article is to systematize theoretical and methodological principles of Design-Based Research (DBR) in educational research focused on the integration of Open Educational Resources (OER). It highlights the characteristics, methodological stages, as well as the strengths and weaknesses of this approach. The article presents the phases of organizing Design-Based Research through diagnosis to identify the problem, design, implementation of iterative cycles, and reflection within the context of online and open teacher training in the Small Open Online Course (SOOC) format. The results demonstrate the potential of DBR to foster collaboration, interaction, and autonomy among all participants in educational research. It is concluded that the cyclical phases of DBR are conducive to generating a dynamic process of action-reflection-action, supporting spirals of design, implementation, and evaluation of educational solutions mediated by net-

worked educational technologies, such as Open Educational Resources, within the scope of pedagogical practice (Ferreira et al., 2017).

Finally, there is a Design-Based Research study about developing instructional technology standards done in many countries around the world, where K-12 educators from Ecuador were considered in this research. In fact, digital technologies are key tools that can be used to extend and enhance teaching and learning. As a result, it mentions that empirical evidence shows that educators are not clear how to integrate technology and it is often used to support past teaching practices (Crompton & Sykora, 2021).

Table 1 shows the results of the literature review of Design-Based Research in higher education in Ecuador.

Table 1

DBR studies in Ecuador

Title	*Author*	*Source*	*Year*	*Format*
Codiseño de una propuesta de filosofía práctica para el Bachillerato General Unificado	Ximena Campaña Carrera	Universidad Andina Simón Bolívar	2023	Master's Thesis
Análisis del diseño tecnopedagógico en entornos virtuales de aprendizaje. Caso de estudio: Universidad Andina Simón Bolívar	Jeimy Chicaiza Yugcha	Universidad Andina Simón Bolívar	2023	Master's Thesis
Using Design-Based Research for an Academic Dropout and Retention Dashboard	Vanessa Heredia-Jimenez; Jhony Yaguana; Alberto Jimenez-Macıas; Margarita Ortiz-Rojas	2023 Ninth International Conference on eDemocracy & eGovernment (ICEDEG)	2023	Conference
Educación digital y formación del profesorado en modalidades	Jorge Bal-	Universidad	202	Book

semipresencial y virtual (B-learning y E-learning). Estudios de caso	ladares Burgos	Andina Simón Bolivar.	1	
Developing instructional technology standards for educators: A design-based research study	Helen Crompton; Carolyn Sykora	Computers and Education Open	2021	Journal
Percepciones en torno a una educación remota y a una educación híbrida universitaria durante la pandemia de la COVID-19: estudio de caso	Jorge Balladares Burgos	RiiTE Revista Interuniversitaria de Investigación en Tecnología Educativa	2021	Journal
Análisis de registros de representación semiótica en la aplicación de la ingeniería basada en el diseño (IBD) como metodología de investigación, para la enseñanza de la conceptualización y formalización de la noción del límite, mediante un entorno virtual de aprendizaje.	Cristian Díaz	Escuela Superior Politécnica del Ejército	2019	Master's Thesis
El uso de la tablet y su incidencia en el aprendizaje digital móvil: estudio de caso.	Jorge Balladares; Verónica Maldonado; Alex Rivas	593 Digital Publisher CEIT	2019	Journal
La investigación educativa en el profesorado universitario: hacia	Jorge Bal-	Revista Andina de Educación	201	Journal

una investigación basada en el diseño instruccional	ladares Burgos		8	
Princípios teórico-metodológicos do design-based research (DBR) na pesquisa educacional tematizada por recursos educacionais abertos (REA)	Ana Maria Ferreira Nobre; Elena Maria Mallmann; Isabelle Martin-Fernandes; Mara Denize Mazzardo	Revista San Gregorio	2017	Journal
Aprendizaje Basado en la Investigación: caso UNEMII	Johana Espinel; Verónica, Junes; Lady Robles; Carmita Amaya; Gisela Ramirez; Richard Ramirez	Ciencia UNEMI	2017	Journal

4.0 Discussion & Conclusion

From the results, an evolution of the incidence of Design-Based Research in higher education in Ecuador is perceived. Although initial studies were not very clear in the use of this research approach, the first explicit studies utilizing this research paradigm revolve around open educational resources and teacher training. Subsequently, it is evident that Design-Based Research gains momentum in investigations concerning pedagogical designs, e-learning and b-learning, and remote education. Especially in the pedagogical designs of e-learning, new proposals are evidenced in theoretical frameworks, particularly in techno-pedagogical models to conceive distance education in higher education in Ecuador. In turn, it is anticipated that this type of research will focus its efforts on virtual learning environments and teaching practice.

Given the slow emergence of Design-Based Research in Ecuadorian universities and that its lack is well known, the potential of this type of research to improve educational practices cannot be dismissed, in addition to fostering research competencies in students and faculties. One of the shortcomings in Ecuadorian universities has been the dis-

tinction between research and university teaching; therefore, Design-Based Research emerges as alternative research linked to teaching practice and the educational process in the classroom.

Design-Based Research (DBR) emerges as a progressive paradigm that merges instructional design, research, and practice, presenting a significant avenue for conducting educational research within university teaching. This methodology concentrates on scrutinizing educational scenarios and devising solutions to enhance them, yielding context-sensitive insights that enrich teaching methodologies. Educational inquiry grounded in Design-Based Research holds promise in tackling specific educational challenges and furnishing valuable perspectives for refining higher education pedagogies.

Nonetheless, it is imperative to acknowledge that this research approach extends beyond assessing individual faculty performance, encompassing the cultural, political, and social dynamics of educational establishments. Hence, it is crucial for Ecuadorian university faculties to delve into research pertinent to their teaching practices, fostering the advancement of knowledge within their respective domains. This endeavor not only benefits students but also elevates the overall caliber of higher education.

Even though there are few studies about Design-Based Research as a research approach in Ecuador, there is still a lack of researches about this research paradigm. Most of these studies focus on the advantages of Design-Based Research on new instructional designs, teaching education or teaching practice. However, the few studies reflect the intention to promote this educational research paradigm in order to face educational problems in Universities. Besides, Design-Based Research responds to educational technology challenges in Ecuadorian higher education and it appears to be a promising research approach for higher education in Ecuador.

5.0 References

Armstrong, M., Welsh, J., & Dopp, C. (2020). Design-Based Research. In R. Royce Kimmons & S. Caskurlu, *The Students' Guide to Learning Design and Research*. EdTech Books. https://doi.org/10.59668/10

Balladares, J. (2021a). *Educación digital y formación del profesorado en modalidades semipresencial y virtual (B-learning y E-learning). Estudios de caso.* Corporación Editora Nacional/Universidad Andina Simón Bolívar.

Balladares, J. (2021b). Percepciones en torno a una educación remota y a una educación híbrida universitaria durante la pandemia de la COVID-19: estudio de caso. *RiiTE Revista Interuniversitaria de Investigación en Tecnología Educativa*, (11), 25–39. https://doi.org/10.6018/riite.489531

Balladares, J. (2018). La investigación educativa en el profesorado universitario: hacia una investigación basada en el diseño instruccional. *Revista Andina De Educación*, 1(1), 30–34. https://doi.org/10.32719/26312816.2018.1.1.4

Balladares, J., Maldonado, V., & Rivas, A. (2019). El uso de la tablet y su incidencia en el aprendizaje digital móvil: estudio de caso. *593 Digital Publisher CEIT*, 4(4), 19–28. https://doi.org/10.33386/593dp.2019.4.102

Boyer, E. (1990). *Scholarship reconsidered: Priorities of the Professoriate*. Carnegie Foundation for the Advancement of Teaching.

Campaña, X. (2023). *Codiseño de una propuesta de filosofía práctica para el Bachillerato General Unificado*. Tesis (Maestría en Investigación en Educación). Universidad Andina Simón Bolívar, Sede Ecuador. http://hdl.handle.net/10644/9303

Chicaiza J. (2023). *Análisis del diseño tecnopedagógico en entornos virtuales de aprendizaje. Caso de estudio: Universidad Andina Simón Bolívar*. Tesis (Maestría en Investigación en Educación). Universidad Andina Simón Bolívar, Sede Ecuador. http://hdl.handle.net/10644/9098

Cobo, C., & Moravec, J. (2011). *Aprendizaje Invisible. Hacia una nueva ecología de la educación*. Publicacions i Edicions de la Universitat de Barcelona.

Collins, A., Joseph, D., & Bielaczyc, K. (2004). Design research: Theoretical and methodological issues. *Journal of the Learning Sciences*, 13(1), 15–42. https://doi.org/10.1207/s15327809jls1301_2

Crompton, H., & Sykora, C. (2021). Developing instructional technology standards for educators: A design-based research study. *Computers and Education Open*, 2, 1–11, Article 100044. https://doi.org/10.1016/j.caeo.2021.100044

Crosetti, B., & Salinas, J. M., (2016). La Investigación Basada en Diseño en Tecnología Educativa. *Revista Interuniversitaria de Investigación en Tecnología Educativa (RIITE)*, 44–59.

Díaz, C. (2019). *Análisis de Registros de Representación semiótica en la aplicación de la ingeniería basada en el diseño (IBD) como metodología de investigación, para la enseñanza de la conceptualización y formalización de la noción del límite, mediante un entorno virtual de aprendizaje*. Tesis (Maestría en Enseñanza de la Matemática). Escuela Superior Politécnica del Ejército. http://repositorio.espe.edu.ec/handle/21000/16074

Espinel, J., Robles, J., Ramírez C., & Ramírez, R. (2017). Aprendizaje Basado en la Investigación: caso UNEMII. *Ciencia Unemi*, 9 (21): 49–57. https://doi.org/10.29076/issn.2528-7737vol9iss21.2016pp49-57p

Ferreira, A. M., Mallmann, E. M., Martin-Fernandes, I., & Denize, M. (2017). Principios teórico-metodológicos de design-based research en la investigación educativa basada en recursos educativos abiertos. *Revista San Gregorio*, 1(16), 128–141. https://doi.org/10.36097/rsan.v1i16.425

Gibelli, T. (2014). La investigación basada en diseño para el estudio de innovación en educación superior que promueve la autorregulación del aprendizaje utilizando TIC. *Congreso Iberoamericano de Ciencias, Tecnología, Innovación y Educación*, OEI, 2–16.

Giménez, A. (2016). El papel de la gestión de centros educativos en un modelo de aprendizaje basado en competencias. *Páginas de Educación*, 9(1), 5–15. http://www.scielo.edu.uy/scielo.php?script=sci_arttext&pid=S1688-74682016000100001&lng=es&tlng=es

Heredia-Jimenez, V., Yaguana, J., Jimenez-Macıas A., & Ortiz-Rojas, M. (2023). Using Design-Based Research for an Academic Dropout and Retention Dashboard, *2023 Ninth International Conference on eDemocracy & eGovernment (ICEDEG)*, pp. 1–5. https://doi.org/10.1109/ICEDEG58167.2023.10122065

Huggins, R., Jenkins, A., & Scurry, D. (2007). *Undergraduate research in selected US universities: report on US visit – institutional case studies*. York, UK: Higher Education Academy.

Jaramillo, C., Orellana, V., & Balladares, J. (2020). *Lineamientos para un proceso educativo en modalidades no presenciales*. Universidad Andina Simón Bolívar. http://bit.ly/4dpAxcA

LOES (2018). *Ley Orgánica de Educación Superior*. Consejo de Educación Superior. https://www.ces.gob.ec/documentos/Normativa/LOES.pdf

Laurillard, D. (2002). *Rethinking Teaching for the knowledge society*. Educase review, 1(37), 16–25.

Pérez, A. (2010). Nuevas exigencias y escenarios para la profesión docente en la era de la información y de la incertidumbre. *Revista Interuniversitaria de Formación del Profesorado*, 68, 17–36.

Quindemil, E., Intriago S., & Rumbaut, F. (2017). La educación superior en el Ecuador en el período 2008-2016. Oportunidades para la universidad técnica de Manabí. *Revista Cognosis*, 2(3), 71–84. https://doi.org/10.33936/cognosis.v2i3.859

Quirola, D. (2010). La universidad ecuatoriana en la transición hacia la sociedad del buen vivir basada en el bioconocimiento. In R. Ramírez, *Transformar la Universidad para transformar la sociedad*, Senplades, 195–216.

Ramírez, R. (2016). *Universidad urgente para una democracia emancipada*. CIESPAL.

Ribadeneira, D., Arellano, F., & Zaruma, O. (2022). Desarrollo profesional de docentes: análisis de los componentes de desarrollo en la actualidad. *Uisrael Revista Científica*, 11–19. https://doi.org/10.35290/rcui.v9n2.2022.527

Rinaudo, M., & Donolo, D. (2010). Estudios de diseño. Una perspectiva prometedora en la investigación educativa. *Revista de Educación a Distancia (RED)*, 22, 1–29. https://revistas.um.es/red/article/view/111631

The Design-Based Research Collective (2003). Design-Based Research: An Emerging Paradigm for Educational Inquiry. *Educational Researcher*, 32(1), 5–8. https://doi.org/10.3102/0013189X032001005

Valverde, J. (2016). La investigación en Tecnología Educativa y las nuevas ecologías del aprendizaje: Design-Based Research (DBR) como enfoque metodológico. *RiiTE Revista Interuniversitaria de Investigación en Tecnología Educativa*, https://doi.org/10.6018/RIITE/2016/257931

Wang, F., & Hannafin, M. (2005). Design-Based Research and Technology-Enhanced Learning Environments. *Educational Technology Research and Development*, 53(4), 5–23. https://doi.org/10.1007/BF02504682

Author Profile

Jorge Balladares, is an Associate Professor and Researcher at Universidad Andina Simon Bolivar in Quito, Ecuador . His research interest are: ICT for Education, Design-based Research, Educational Technology, Digital Ethics, and Artificial Intelligence applied in Education. He got his Ph.D. in Teaching and ICT in Education at Extremadura University, Spain. He got his Post-Doc at European Scientific Institute (ESI) and La Laguna University (Spain).
http://www.uasb.edu.ec

Author Details

Jorge Balladares
Universidad Andina Simón Bolívar
Toledo N22-80
Ecuador
+593-9-84016823
jorge.balladares@uasb.edu.ec

Editor Details

Prof. Dr. Tobias Jenert
Chair of Higher education and Educational Development
University of Paderborn
Warburgerstraße 100
Germany
+49 5251 60-2372
Tobias.Jenert@upb.de

Journal Details

EDeR – Educational Design Research
An International Journal for Design-Based Research in Education
ISSN: 2511-0667
uhh.de/EDeR
#EDeRJournal (our hashtag on social media services)

Published by

Hamburg Center for University Teaching and Learning (HUL)
University of Hamburg
Schlüterstraße 51
20146 Hamburg
Germany
+49 40 42838-9640
+49 40 42838-9650 (fax)
EDeR.HUL@uni-hamburg.de
hul.uni-hamburg.de

In collaboration with

Hamburg University Press
Verlag der Staats- und Universitätsbibliothek Hamburg –

Landesbetrieb
Von-Melle-Park 3
20146 Hamburg
Germany
+49 40 42838 7146
info.hup@sub.uni-hamburg.de
hup.sub.uni-hamburg.de