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Artículo científico

# WebQuest as a formative assessment method for higher education

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**Abstract:**
Assessment has become a frequent topic of didactic debate and concern among the various bodies that make up academic life. Meanwhile, WebQuests have emerged as an active learning tool that fosters competencies in autonomous, collaborative, and digital learning. The objective of this research was to establish the effectiveness of WebQuests as a formative assessment tool in higher education. A field study was conducted with a sample of 104 students from the National University of Chimborazo (UNACH). The approach was mixed, with a descriptive scope and cross-sectional design. The results demonstrated that the WebQuest is an effective method for assessing the ability to address both conceptual content and practical skills, as well as students' attitudes. This provides comprehensive formative assessment that not only measures theoretical knowledge but also its applicability in real-world situations.

**Keywords:** WebQuest, formative assessment, theoretical knowledge, procedural knowledge, attitudinal knowledge.

**Resumen:**
La evaluación se ha convertido en un tema frecuente de debate didáctico y de preocupación de los distintos estamentos que integran la vida académica. Mientras tanto, la WebQuest se presenta como una herramienta de aprendizaje activo que desarrolla competencias de aprendizaje autónomo, colaborativo y digital. El objetivo de esta investigación fue establecer la efectividad de la WebQuest como herramienta de evaluación formativa en la educación superior. Se llevó a cabo una investigación de campo con una muestra de 104 estudiantes de la Universidad Nacional de Chimborazo (UNACH). El enfoque fue mixto, el alcance descriptivo y el corte transversal. Los resultados demostraron que la WebQuest es un método eficaz para evaluar la capacidad de abordar tanto el contenido conceptual como las habilidades prácticas y la actitud de los estudiantes. Esto proporciona una evaluación formativa integral que no solo mide el conocimiento teórico, sino también su aplicabilidad en situaciones del mundo real.

**Palabras clave:** WebQuest, evaluación formativa, conocimiento teórico, conocimiento procedimental, conocimiento actitudinal.

## 1. Introduction

The use of WebQuest in higher education is becoming increasingly important as a structured and autonomous approach to learning. WebQuest is a teaching strategy designed to promote active and meaningful learning through the use of online resources. The concept was created by Bernie Dodge in 1995 and developed by Tom March in 1998 (Abuín, 2007), to harness the educational potential of the Internet in the educational environment.

Soto Santiesteban et al. (2022) define WebQuest as "a straightforward and rich learning resource for promoting the educational use of the Internet, based on cooperative learning and research processes" (p. 1). When teachers use WebQuest as a teaching strategy, they present students with authentic challenges or problems that they must solve using resources available on the web. This encourages collaborative work and places the student at the center of the knowledge-building process (Ebadi & Rahimi, 2018). It also contributes to the development of critical thinking skills by teaching students how to think rather than what to think. This involves paying attention to context and cultivating the ability to make critical and evaluative judgments (Alberca Latorre, 2021).

The main objective of WebQuest is to engage students in a process of research and knowledge construction using online resources, thereby encouraging critical thinking, research, and collaboration.

The benefits provided by WebQuest are evident in the research by Katayama Cruz and Rojas Montero (2021), where they conclude that WebQuest presents a series of organized and sequential steps that are designed to encourage critical thinking, creativity, and team collaboration, to facilitate reflective learning.

Similarly, Villegas Dianta et al. (2022), in their study on how WebQuests support university education, state that WebQuests meet contemporary demands by addressing aspects such as collaboration, problem solving, and information management skills, along with the development of digital skills.

On the other hand, educational assessment has been a topic of debate in teaching. It has raised concerns at different levels of academic life to improve teaching and learning processes and, consequently, the quality of the educational system. Assessment is defined as "an educational practice consistent with an education that seeks to raise critical-collective awareness, transform society, and liberate the individual through the full realization of their capabilities" (Remolina-Caviedes, 2020, p. 3). Assessment regulates learning.

When it is carried out with the explicit intention of guiding students toward the development of the strategic thinking necessary to achieve autonomous learning, in this context, it is considered that "assessment for learning is an alternative for transforming university academic life, empowering students, and generating meaningful learning" (Rodríguez Gómez & Salinas Salazar, 2020, p. 2).

In this sense, Morales López et al. (2020) have summarized the dimensions addressed in the assessment process, answering fundamental questions such as what?
how?, who?, with what?, when?, and why? These dimensions are closely related to different aspects of learning, including theoretical knowledge, practical skills, professional competencies, and attitudes. The goal is to evaluate students' overall development in a balanced and comprehensive manner.

Regarding the dimension related to the timing of the assessment, Morales López et al. (2020) clarify that this refers to the time at which the assessment is carried out, which can be of three types: initial, continuous, and final. The primary purpose of the initial assessment is to diagnose students' prior knowledge. Continuous assessment, on the other hand, focuses on evaluating formative activity, which is the primary focus of this study. Finally, the final assessment is closely linked to summative assessment, its objective being to establish a grade, whether quantitative or qualitative.

In higher education, formative assessment focuses on the learning process, providing timely and meaningful feedback to improve student performance. In this context, Hidalgo Apunte (2021) argues that formative assessment plays a crucial role in enabling students to become aware of their learning process, while also giving teachers the ability to reorient their teaching strategies in order to obtain more effective results.

Similarly, Bazán et al. (2022) emphasize the importance of developing formative assessment models that include criteria that encourage active student participation, critical reflection on the products of their learning, and a critical attitude toward how they produce and present their evidence (p. 7).

In today's global environment, educational demands aimed at providing high-quality education are focused on the implementation of formative assessment, which is considered essential for evaluating learning processes linked to the acquisition of skills and abilities (Fraile et al., 2019). Sometimes, formative assessment tends to focus more on assigning grades and results than on truly understanding the learning process. This tendency can reduce its effectiveness in terms of providing meaningful feedback and enriching student learning.

According to Pérez-Pueyo et al. (2019), in the Latin American context, the difficulty in applying formative assessment lies in the limited use and mastery of formative assessment resources by teachers. This is mainly attributed to a lack of resources and time, factors that can hinder the effective implementation of formative assessment, leading to less effective or even negligent assessment practices.


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Relating the concepts and importance of WebQuests to assessment models, Rivera Patrón (2010) highlights the need to train university teachers in the creation, application, and evaluation of WebQuests as an educational tool. The specific objectives focused on evaluating a training strategy for acquiring skills in the use of WebQuest and on evaluating how they are implemented in university teaching, linking this to student achievement and satisfaction. In addition to exploring the characteristics and relevance of technological tools in higher education, it focused on the structure of a WebQuest and shared experiences on its application in university settings. The research considers the students' perspective, their satisfaction with the tool, and the teachers' perception, offering a comprehensive view of the effectiveness of WebQuest in higher education.

Similarly, Caro and Guardiola (2012) state in their research that WebQuest, used as a teaching guide, proved to be a novel and stimulating methodological and assessment strategy, as it not only managed to arouse students' interest but also successfully met the learning objectives; improved results compared to the previous year, as more students showed progress in their assessments upon completing the proposed tasks.

In this context, WebQuest emerges as an ideal tool for formative assessment, as it allows teachers to monitor students' progress as they complete activities. This provides continuous feedback and opportunities to improve research skills, thus preparing students to face the challenges of today's digital world. In addition, WebQuests can be adapted to meet the specific needs and interests of students (Silva Porras, 2020). Teachers can design tasks that suit different learning styles and skill levels, thus fostering a more personalized educational experience.

WebQuests are also aligned with today's reality, where access to online information is becoming increasingly important. This tool trains students in the critical and efficient management of the overwhelming amount of information available on the Internet. Students acquire fundamental digital skills, such as searching for and evaluating information online, using technological tools, and the ability to synthesize and communicate information through digital media.

## 2. Materials and methods

The research was conducted using a mixed approach, combining the analysis of data from assessment reports on the conceptual, procedural, and attitudinal dimensions of students' knowledge during their training process, as they completed each stage of the WebQuest. The data collected in the assessment of conceptual and procedural knowledge are categorized as quantitative, since numerical and measurable data were obtained through an assessment rubric and a questionnaire, which were then converted into statistical information. In contrast, the assessment of attitudinal knowledge was carried out qualitatively using a checklist that provided valuable information based on a reflective analysis of the situations and experiences during the execution of the WebQuest. These data allowed for meaningful inferences about the relevance of the WebQuest in the context of formative assessment.

The study population consisted of 104 students enrolled in teacher training at UNACH during the academic periods from October to February 2022 and from April to August 2023, aged between 18 and 22 years. A non-probabilistic and intentional sample was used, including the entire population in the class schedule corresponding to the Infopedagogy course.

To carry out the study, the analytical method was applied to investigate the phases of the WebQuest, in order to understand its structure and functioning about the learning objectives, online resources, and evaluation criteria. At the same time, the synthetic method was used to integrate the various components of the WebQuest, allowing for a more complete understanding of its functionality as a formative assessment strategy.

The study was framed within the category of action research, exploring how university students can effectively design a WebQuest as a formative assessment method and how this experience impacts their learning process and development of pedagogical skills. The research involved close collaboration between the students and the teacher.

The process began with identifying the problem, recognizing the need to improve understanding and application of formative assessment through the use of WebQuest in the educational process. Next, work teams were formed and guided by the teacher in planning and designing WebQuests on topics related to their professional profile. The structure and foundation of the WebQuest were based on the comprehensive design of the activity, where students, in their training as future teachers, applied their knowledge of the structure and purpose of WebQuest. In addition, as students in teacher training, they were allowed to develop their teaching materials, which were integrated as a key input in the construction of the WebQuest. This approach not only enhanced their teaching skills but also provided them with the experience of designing and applying teaching tools independently.

By establishing tasks and assessment rubrics as an integral part of the process, students not only developed assessment skills but also gained a deeper understanding of quality criteria in teaching. Now, as a fundamental activity, it allows the research teacher to evaluate gradually and comprehensively, providing feedback throughout the various stages of development. This made it possible to identify and correct errors, guiding students toward continuous improvement by encouraging reflection on learning objectives, online resources, and assessment criteria.

In a third stage, students presented their WebQuests online and in the classroom to receive constructive feedback, which provided them with valuable information about

their strengths and areas for improvement in terms of content, resource design skills, and their attitude toward collaborative work. This allowed students to learn from their mistakes, deepen their understanding of the subject, identify conceptual errors, and reflect on their process. work and decisions. In addition, quality work was recognized and reinforced to increase students' motivation and confidence in their academic abilities. Figures 1 and 2 present examples of the WebQuests designed by the two groups of students as part of the formative assessment of the Infopedagogy course at UNACH.

At the end of each group presentation, conclusions were drawn based on the evidence gathered, and recommendations were made for future developments of WebQuest and training in the field of teaching.

This comprehensive approach, from the formation of work teams to the presentation of the WebQuests, provided data that was collected using observation techniques with a checklist as a data collection tool. This methodology allowed us to obtain qualitative information on a dichotomous scale regarding the presence or absence of certain behaviors or attitudes of students toward collaborative work in the design of WebQuests. The assessment criteria are presented in Table 1.

Another data collection resource was used, the assessment rubric, which played a fundamental role in evaluating the design of the WebQuest in all its stages and resources. This tool was characterized by the definition of clear criteria and specific standards for each phase of the WebQuest, which resulted in a precise guide for students in terms of quality and content at each stage and resource. The assessment rubric proved to be an effective tool for establishing measurable criteria and performance levels, thus helping to mitigate subjectivity and promote a fairer and more consistent evaluation.

The indicators included in the assessment rubric covered a wide range of skills and competencies, including aspects such as clarity of instructions, appropriate selection of resources, effective integration of technology, and demonstration of creativity, as illustrated in Table 2. These assessment rubrics were applied in mid-term evaluations and were used to monitor progress toward previously established objectives, thus ensuring continuous and constructive evaluation of the WebQuest design and development process.

To assess conceptual knowledge related to the WebQuest, a survey technique was implemented, using a standardized test as the primary data collection instrument. This test was meticulously designed, incorporating precise and uniform questions and criteria focused on the objectives, components, methodology, and benefits inherent to the WebQuest. The fundamental purpose of this test was to assess the students' deep and solid understanding of the key concepts associated with the WebQuest.


**Figure 1:** WebQuest designed in the Infopedagogy course, Physical Activity and Sports Education degree program – UNACH.
**Source:** Gaona et al. (2023).

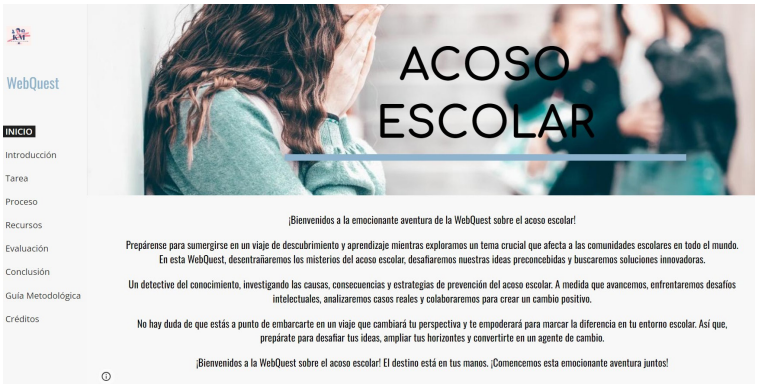


**Figura 2:** WebQuest diseñada en la asignatura de Infopedagogía, carrera de Psicopedagogía – UNACH.
**Fuente:** León y Ledesma (2023).


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**Table 1:** Assessment of the attitudinal dimension in the WebQuest design and development process
**Source:** Own elaboration

| Checklist for assessing student attitudes in the WebQuest design and development process | | |
|---|---|---|
| **Assessment criteria** | **Assessment** | |
| 1. Active participation | | |
| Did the student actively participate in group discussions and activities? | Yes ( ) | No ( ) |
| 2. Collaboration and communication | | |
| Did the student collaborate effectively with classmates, sharing ideas and supporting each other? | Yes ( ) | No ( ) |
| 3. Respect for opinions | | |
| Did the student show respect for the opinions and perspectives of other team members? | Yes ( ) | No ( ) |
| 4. Fair distribution of tasks | | |
| Did the student contribute to the fair distribution of responsibilities and tasks within the group? | Yes ( ) | No ( ) |
| 5. Individual contribution | | |
| Did the student contribute their ideas and efforts to the design of the WebQuest? | Yes ( ) | No ( ) |
| 6. Conflict resolution | | |
| Did the student address disagreements or conflicts constructively and find solutions? | Yes ( ) | No ( ) |
| 7. Motivation and commitment | | |
| Did the student show a high level of enthusiasm, commitment, and dedication to the task? | Yes ( ) | No ( ) |
| 8. Creativity and originality | | |
| Did the student demonstrate creativity in proposing novel ideas and innovative solutions? | Yes ( ) | No ( ) |

**Table 2:** Assessment criteria for the procedural dimension in the WebQuest design and development process
**Source:** Own elaboration

| Rubric for evaluating the procedural dimension in the elaboration of the WebQuest | | | | | |
|---|---|---|---|---|---|
| | **Valuation scales** | | | | |
| **Evaluation Criteria** | **1** | **2** | **3** | **4** | **5** |
| Task and resource design | The tasks and resources are not related or are ineffective. | Some tasks and resources are related to the topic, but lack coherence. | The tasks and resources are aligned with the topic and are appropriate. | The tasks and resources are adequate, varied, and enhance learning. | The tasks and resources demonstrate creativity and enrich the learning experience. |
| Structure and organization | The structure lacks fluency and cohesion. | The structure is evident, but some sections could be better organized. | The structure is clear and guides the student through the WebQuest. | The structure improves comprehension and facilitates navigation. | The structure is exceptionally organized and facilitates a smooth learning experience. |
| Instructions and guidance | The instructions are confusing or difficult to follow. | The instructions are understandable, but could be clearer. | The instructions are clear and guide the student through the tasks. | The instructions are concise, precise, and promote success. | The instructions are exceptionally clear, support learning, and avoid confusion. |
| Technology integration | Technology integration is minimal or unrelated to the topic. | Some technological elements are included, but could be more relevant. | Technology is appropriately integrated to improve the WebQuest. | Technology is effectively used to enrich the design and learning. | Technology integration is exceptional and transforms the WebQuest experience. |
| Creativity | The design lacks creative elements. | Attempts at creativity are evident, but could be more innovative. | Creative elements are incorporated that enrich the experience. | Creativity stands out and adds originality to the design of the WebQuest. | Creativity is exceptional and demonstrates a unique and innovative approach. |
| WebQuest presentation | The presentation lacks clarity and coherence. | The presentation is understandable but could be more fluent. | The presentation is clear and guides through the key aspects of the WebQuest. | The presentation is effective, engaging, and supports the success of the WebQuest design. | The presentation is exceptional, captivating, and highlights the quality of the WebQuest design. |

The careful design of this test provided an effective means of identifying areas where students demonstrated solid knowledge and areas where they required further attention and pedagogical focus. Thanks to these results, an accurate and meaningful assessment of students' conceptual understanding of the WebQuest was achieved, which in turn informed specific training and skill development needs.

## 3. Results

The assessments carried out throughout the training phase during the design and development of the WebQuest provided a constant and regular source of information on student progress and learning. These data, collected using data collection instruments, were tabulated and statistically analyzed using SPSS V. 27 statistical software.

The information relating to the formative assessment of procedural knowledge in the design and implementation of the WebQuest is detailed in Table 3 and represented by a scatter plot in Figure 3.

The range of scores for procedural knowledge ranged from a minimum of 5.79 points to a maximum of 10 points. The mean, which was 9.16, indicates that, on average, students achieved a high level of competence in this dimension. The standard deviation, with a value of 0.66527, reflects a moderate dispersion of scores from the mean. This suggests that the scores tend to cluster around the mean value. The average score is 9.16 points, and the scores are closer to the mean than widely dispersed around it. This pattern is confirmed by the variance, which reaches a value of 0.443.

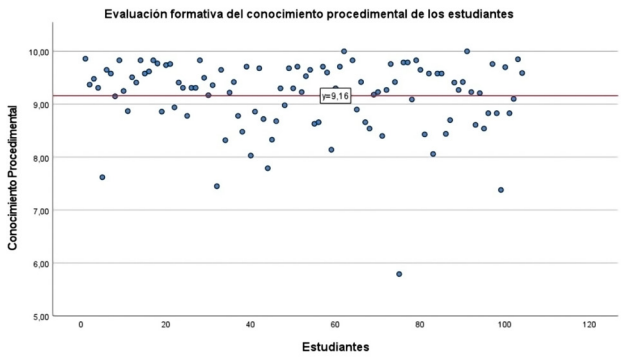


**Figure 3:** Scatter plot of the assessment of procedural knowledge in the design and development of the WebQuest
**Source:** Prepared by the authors

The skewness coefficient, which has a negative value of -1.869, indicates that the distribution of scores shows a longer left tail than the right. In other words, the distribution is skewed to the left.

This left skew implies that most values are on the right side of the distribution, while lower values are less frequent and are on the left side. This implies that the lower scores are farther from the mean than the higher values.

The kurtosis value, which reaches a significant 5.772, indicates that the data distribution has denser or more extended tails compared to a normal distribution, particularly toward the left side. This characteristic reveals the presence of outliers in the data set. This finding is consistent with the existence of a score below 7 points and the presence of four scores ranging between 7 and 8 points. These data are noteworthy, as most scores are concentrated in the 8 to 10 point range.

On the other hand, about the formative assessment of conceptual knowledge related to WebQuest, the specific details are recorded in Table 4 and presented visually through a scatter plot in Figure 4.

In the formative assessment of conceptual knowledge, a minimum score of 5.17 points was recorded, while the maximum score reached 9.62 points. The average of 8.21 points reflects that, on average, students performed well in this dimension. However, the standard deviation of 0.89164 indicates that the scores are more widely dispersed around the mean. The asymmetry, with a value of -1.119, and the kurtosis of 1.283, denote a non-normal distribution with a longer left tail and a slight flattening in the central part of the distribution.

These data allow for a comparative analysis between the formative assessments of procedural and conceptual knowledge. Although the minimum and maximum values vary in both dimensions, the total range is similar, suggesting that both forms of knowledge are comparable. show variation within a similar range of scores. However, procedural knowledge shows a slightly higher average compared to conceptual knowledge, indicating that, on average, students have achieved a higher level of understanding in the procedural dimension. On the other hand, conceptual knowledge exhibits a higher standard deviation than procedural knowledge, suggesting that scores in conceptual knowledge are more dispersed around the mean than in procedural knowledge. In addition, both dimensions of knowledge show negative asymmetry,

**Table 3:** Statistical data from formative assessment of students' procedural knowledge in the design and development of WebQuests
**Source:** Prepared by the author

| Descriptive statistics on students' procedural knowledge | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | N | Minimum | Max | Mean | Standard deviation | Variance | Skewness | | Kurtosis | |
| | | | | | | | Statistic | Standard error | Statistical | Standard error |
| Procedural knowledge | 104 | 5.79 | 10.00 | 9.1602 | 0.66527 | 0.443 | -1.869 | 0.237 | 5.772 | 0.469 |


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**Table 4:** Statistical data from formative assessment of students' conceptual knowledge of aspects related to WebQuest
**Source:** Prepared by the authors

| Descriptive statistics on students' conceptual knowledge | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | N | Mini-mum | Maxi-mum | Mean | Standard deviation | Variance | Skewness | | Kurtosis | |
| | | | | | | | Statistic | Standard error | Statistic | Standard error |
| Conceptual knowledge | 104 | 5.17 | 9.62 | 8.2134 | 0.89164 | 0.95 | -1.119 | 0.237 | 1.283 | 0.469 |

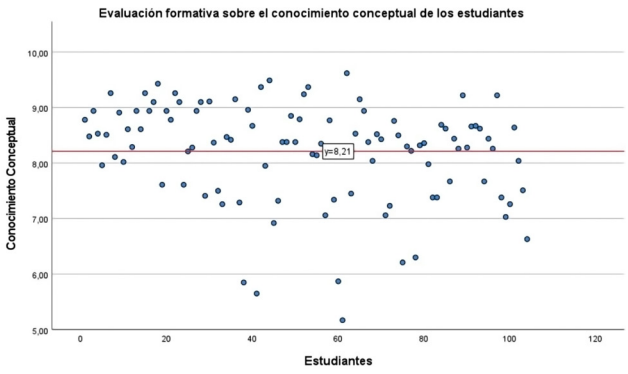


**Figure 4:** Scatter diagram of the assessment of conceptual knowledge on aspects related to WebQuest
**Source:** Own elaboration

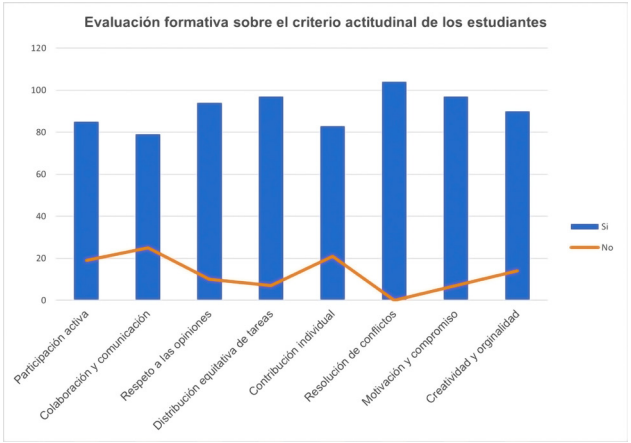


**Figure 5:** Representation of the assessment of attitudinal knowledge in the process of designing and developing the WebQuest
**Source:** Prepared by the author

indicating a long tail in the distribution of scores. However, this asymmetry is more pronounced in procedural knowledge than in conceptual knowledge.

In addition, data were collected using a checklist to assess the students' attitudinal component. These data are represented in a combined statistical graph using grouped bars and lines, created with Microsoft Excel software. This graph is presented in Figure 5 and provides a compelling visualization of the formative assessment results regarding the attitudinal dimension.

The data collected through the checklist reveal that a total of 89 students demonstrated a positive and participatory attitude in various aspects during the WebQuest design and development process. This finding suggests that students were engaged and enthusiastic about the WebQuest creation process. Notably, it was observed and documented that students participated actively in the process. In addition, 79 of them exhibited effective collaboration and communication among team members, underscoring the importance of interaction among group members in achieving shared goals.

In terms of teamwork dynamics, 94 students showed genuine respect for their peers' opinions, reflecting a harmonious and receptive work environment. In addition, 97 students contributed to ensuring an equitable distribution of tasks, demonstrating a solid understanding of the importance of fairness in the assignment of responsibilities and distribution of workload.

It is also noteworthy that 83 students contributed individually to the development of the final product, emphasizing the individual involvement of each team member in the project. Furthermore, 90 students proposed creative and original ideas for the design and development of the WebQuest, indicating the diversity of approaches and perspectives in the process.

In terms of motivation and commitment, 97 of the students were highly motivated and committed to achieving the objectives of the collaborative work. This suggests that they had a solid understanding of the objectives and were willing to work together to achieve them. Furthermore, it is important to note that when conflicts arose, all students were able to address them constructively, demonstrating conflict resolution skills within the group.

## 4. Discussion

The data collected sheds light on the difference in the level of knowledge between the procedural and conceptual dimensions. It is observed that students have more robust knowledge in the procedural dimension, while scores in the conceptual dimension tend to show greater variability around the mean. Although both dimensions show a similar distribution in terms of asymmetry, it is clear that WebQuest favors the development of procedural knowledge to a greater extent than conceptual knowledge. Students obtain higher and more consistent average scores in the procedural domain, suggesting that they are acquiring a solid understanding of how to carry out WebQuest-related procedures through the "learning by doing" approach. On the other hand, in conceptual knowledge, a lower average value and variability in scores are observed, indicating a wider range of responses and levels of understanding in this dimension.

About conceptual knowledge, the data show that students have achieved an adequate level of understanding in terms of the concepts and theory related to WebQuest. However, it is important to note that there may be variability in the depth of this understanding. WebQuest provides a framework conducive to compelling exploration and understanding of concepts, while also allowing students to apply their perspective and approach to certain conceptual aspects.

Regarding the formative assessment of attitudinal knowledge, the data reveal that students demonstrate a positive attitude toward teamwork, effective communication, and collaboration during the completion of the WebQuest. These results indicate effective group work dynamics and an active disposition toward the learning process. Students exhibit positive attitudes toward collaboration, communication, and constructive conflict resolution, which is essential given that the WebQuest involves team tasks. This encourages the adoption of participatory attitudes, respect, individual contribution, and problem-solving skills.

The results presented underscore the relevance of WebQuest in formative assessment in higher education. These findings are supported by previous research by various authors in the field, who have also documented the positive impact of WebQuest on the learning process of students and the development of essential skills. The data support the assertion by Sánchez Allende et al. (2019) regarding the positive impact of WebQuest on learning and skills development, highlighting its contribution to improving the learning process and developing skills that might otherwise be lacking.

In addition, the data indicate that WebQuest has expanded students' cognitive abilities by fostering analytical thinking and learning through the creation of digital tools, in line with the findings of Delgado et al. (2020). This simplifies pedagogical options and enhances cognitive abilities by stimulating analytical thinking and promoting relevant learning through the creation of digital tools.

On the other hand, the data underscore the importance of communication between teachers and students, as well as the development of cognitive skills in the digital environment, by the observations of Veloz et al. (2017). WebQuest offers a platform that allows for the cultivation of various skills through the web environment as a learning platform, facilitating communication between teachers and students, and promoting the development of cognitive skills.

In short, this research supports the notion that WebQuest empowers students to play an active role in their learning process, in line with the findings of Cacierra Jiménez (2020), who argues that WebQuest is a highly beneficial pedagogical tool that enables students to play an active role in constructing their knowledge. The use of this digital tool, both in collaborative and individual work, has a positive impact on students' attitudes and performance.

## 5. Conclusions

The combination of the clear structure of the WebQuest and its focus on self-directed research has proven to be a highly effective method for assessing students' ability to address both conceptual content and practical skills, as well as their participation in collaboration and effective communication among peers. This provides a comprehensive formative assessment that not only measures theoretical knowledge but also its applicability in real-world situations. WebQuest engages students in decision-making, problem-solving, and presenting results, which reinforces their autonomy and responsibility in the learning process.

The effectiveness of WebQuest as a formative assessment method is supported by positive indicators found in the evaluation of the three dimensions of knowledge: procedural, conceptual, and attitudinal. In higher education, WebQuest has emerged as a versatile and valuable tool for assessing students in multiple dimensions of learning. Its design and development highlight its ability to foster deep and active learning, as well as to measure the level of understanding and applicability of the concepts taught.

The positive results obtained in the formative assessment of procedural, conceptual, and attitudinal knowledge in the design and development of the WebQuest indicate that students understood the steps and workflow necessary to conduct a WebQuest effectively. They acquired a solid understanding of key concepts related to WebQuest, such as its definition, essential elements, and educational objectives. Furthermore, it shows that students adopted favorable attitudes toward the design and development of WebQuests as a teaching and learning method. This includes their appreciation of its usefulness, motivation to use it, and understanding of its potential impact on education as a formative assessment method.

This set of findings demonstrates that WebQuest has established itself as a highly effective formative assessment method that combines solid pedagogical elements with digital technology. Its focus on active exploration, application of concepts, and promotion of collaborative skills makes it a valuable tool for assessing students' comprehensive learning in a wide variety of disciplines and educational contexts. WebQuest allows students to work independently or in collaborative teams and makes it easier for teachers to collect data on student progress, level of understanding, and information search and synthesis skills. The constant feedback provided by formative assessment allows participants to receive specific and constructive comments on their performance, making it easier for them to adjust their approach and improve their learning. The assessment data obtained in the process encourages a holistic approach to student development, allowing multiple dimensions of learning to be addressed and evaluated at the same time, from the acquisition of practical and theoretical skills to the promotion of positive and collaborative attitudes. This contributes to a process of continuous improvement in the creation of an educational environment in which each student can reach their full potential.


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