Proposal based on remote teaching in self-regulated learning in UNE Initial Education students, 2022

María Luisa Cajo Salvador¹, Graciela Victoria Huatuco Maldonado², Dr. Juan Carlos Valenzuela Condori³, Yovana Milagros Paliza Arellano⁴, Analy Solange Matos Juárez⁵

¹Universidad Nacional de Educación Enrique Guzmán y Valle, Perú, mcajo@une.edu.pe
²Universidad Nacional de Educación Enrique Guzmán y Valle, Perú, ghuatuco@une.edu.pe
³Universidad Nacional de Educación Enrique Guzmán y Valle, Perú, jvalenzuela@une.edu.pe
⁴Universidad Nacional de Educación Enrique Guzmán y Valle, Perú, ypaliza@une.edu.pe
⁵Universidad Nacional de Educación Enrique Guzmán y Valle, Perú, amatos@une.edu.pe

Abstract
The research entitled Proposal based on remote teaching in self-regulated learning in students of Initial Education of the UNE, 2022 is a study of quasi-experimental design, the sample was 79 students divided into two groups 41 and 38, the Gordon questionnaire was used, Lindner and Harris (1996). The results show that in the pre-test, 65.9% of the EG students have regular self-regulated learning, and then in the post-test, 92.7% rise to a very good level; Regarding the control group, it was found in the pre-test that 42.1% were at a regular level, and in the posttest, 47.4% had a good level. It was concluded that the proposal based on remote teaching significantly improves self-regulated learning in UNE Initial Education students, 2022 (z = -6.260, p < 0.05).

Keywords: remote teaching, self-regulated learning, asynchronous, synchronous.

Introduction
The year 2020 was an atypical year, with great challenges due to the COVID-19 pandemic (caused by the SARS-CoV2 virus). This event will be recorded in world history as a transcendent event. In Peru, COVID-19, with its various forms of contagion, generated high rates of transmission
and lethality. All this had an impact on the economy and education, which directly affected the teaching-learning process of students. A measure of social isolation was established, which generated the transition to virtuality in all educational centers, where large groups of students used to gather for long periods of time. This implied the reinvention of educational processes and the consequent generation of new methodologies. Thus, the school has had to adapt to the context of the pandemic (Miguel, 2020); since about 70% of the world’s student population was affected by this fact (UNESCO, 2020).

Distance learning can be a temporary alternative solution to this emergency, in order to continue with the activities of the educational process. For this purpose, the use of platforms such as Google Meet, Microsoft Teams, Zoom was implemented. Likewise, several asynchronous activities were adapted to platforms such as Moodle, Google Classroom, Google Drive and Google Forms. Despite its virtues, distance learning has brought with it difficulties and impacts on the lives of students at different levels. In the particular case of higher education students, what it has brought with it is the demotivation caused by social isolation, which implies the lack of active interaction between students and professors, and significant changes in the design of content.

In general, it does not seem that the change of modality has been received very positively. Part of the disaffection is generated because the content offered was not designed within the framework of a distance higher education course, but rather attempts to compensate for the absence of face-to-face classes with virtual classes, without further preparation (United Nations Educational, Scientific and Cultural Organization for Higher Education in Latin America and the Caribbean [UNESCO IESALC], 2020, p. 16).

In this sense, the lack of social interaction also brought with it problems related to mental health, such as anxiety, fear, depression, insomnia, anguish, among others, which affected many university students. Another problem is related to technological resources. Access to technological resources (computers, notebooks, tablets, internet, among others) is still restricted for part of the population, including students. This is not only due to economic difficulties, but also to lack of knowledge.

Simultaneously, in the international context, the use of technology has been developing together with the emergence of new tools, and the combined use of all or some of them for educational purposes. At the national level, Peru, affected by the pandemic, through the Ministry of Education [MINEDU] (2020), decreed that “the school year [should be developed] in its distance mode due to the high rate of people infected by COVID 19” (p. 1). In view of this, teachers had the urgent need to adapt to remote education, revealing their shortcomings and limitations.
in the use of information technologies, which led to a decrease in the quality of teaching and learning at the different educational levels, both in basic and higher education. Likewise, 30.77% of teachers point out that it is difficult to communicate with students through the Internet, making their teaching task more difficult (Rambay & De la Cruz, 2020).

At the local level, the problem according to the students of the Faculty of Initial Education of the UNE is related to the fact that the teaching staff does not have adequate mastery in the use of remote education to carry out their educational work, in addition to the lack of preparation of teachers to guide students in improving and renewing knowledge continuously at the pace of technological changes that are generated again and again in the territory. To this end, teachers are asked to carry out their work through virtual tools that contribute to sharing information, suggestions for activities, materials, and digital tools. In this process, some teachers are behaving in online teaching in a very similar way as they did in the classroom: giving lectures, using slides, proposing discussion, and requesting written texts and applying tests.

In that sense, this proposal is based on remote teaching so that both teachers and students can be empowered through collaboration and online resources; access to digital technologies and their use can help reduce the learning gap between students of high and low socioeconomic levels. Motivated by which it has been sought, Determine the influence of the proposal based on remote teaching in self-regulated learning in the students of Initial Education of the UNE, 2022. The theoretical importance of this study lies in the fact that it seeks to include fundamental and unpublished theoretical bases on the variables remote teaching and self-regulated learning, which will serve as support to sustain the proposals set forth in this study, its foundations may be incorporated as new knowledge and will serve the scientific community to continue research on these valuable topics. In the same way, this study has methodological justification, because its techniques and instruments for data collection are validated and reliable through the judgment of experts and reliability statistics and can be used in other studies to collect data in similar contexts. Finally, this study has practical justification, because its results can be considered to improve the teaching work in the classroom considering the variables digital competencies and self-regulated learning.

Several international precedents have been found. Among them, it was found that Castro et al. (2021) concluded that it is very important to propose techniques to improve self-regulation, teamwork, and student motivation. Likewise, there should be feedback developed by the teacher, to be clear about teaching in this modality. In the same line, Tello et al. (2021) concluded that there is a high link between the two variables, which means that, if the student has a better degree of resilience, he will have a better level of self-regulation of his learning in
front of his peers. Another study developed by Infante et al. (2021) concludes that 27 technological apps were found to help self-regulation of learning. The most relevant are Whatsapp and Google Calendar, which are also recommended by most university teachers.

On the other hand, at the national level, Guarniz (2021) found that there is a significant positive link between self-regulated learning and digital skills. That is, the better the self-regulated learning, the better the digital skills in the learning achievement of the evaluated students. In this sense, Arcujaulla et al. (2021) indicate that the evaluated students managed to reinforce the self-regulation of their course learning, by means of the inverted classroom model. Furthermore, as Cruzado (2021) indicates, the evaluated students have high degrees of self-regulation. However, after applying the Chatbot, as a support in their learning, this self-regulation increased, which means that this tool, under proper use, offers optimal results.

In this context, a term is formally introduced for the solution offered in these exceptional circumstances: remote teaching. Many members of the academic community have debated on the terminology to be adopted and the term remote teaching has emerged as an alternative to make a distinction with online education. Unlike educational experiences that are fully designed and planned to be online, remote teaching responds to a sudden shift from instructional models to alternatives in a crisis. In these circumstances, use is made of fully remote teaching solutions that would otherwise be delivered face-to-face or as hybrid courses and will return to this format once the crisis or emergency has passed.

In terms of theories about the Remote Learning Based Proposal, Revelo (2017) notes that Connectionist Theory (or simply "Connectionism") was born as a response by George Siemens and Stephen Downes to a perceived need to create a theory of learning for the digital age. According to its proponents, technological progress and the advent of the Internet have resulted in a highly accelerated and dynamic globalized world scenario, leading to an abundance, if not an excess, of information available and easily accessible to a large portion of the world's population. From this point of view, such developments naturally also brought with them impacts on human ways of learning, thus requiring adaptations to classical learning theories. Having the theoretical bases in the present study has been considered Dimensions of the proposal based on remote learning.

Dimension 1: Synchronous tools

The first dimension, called "remote teaching through synchronous tools", according to Martínez (2020), includes chat, videoconferencing, among other immediate interaction technologies. This type of technology can be crucial to meet the needs of teachers of various
disciplines. For example, the teacher can perform an interaction of instant answers, in order to answer the doubts of the students and in this way, the student can assimilate certain content more quickly.

- **Advantages**
  - Possibility of student-teacher and student-student interactions.

- **Disadvantages**
  - Possibility that the institution's system does not support simultaneous demand.
  - Difficulty of access for students

**Dimension 2: Asynchronous tools**

The second dimension, called "remote teaching through asynchronous tools", according to Martínez (2020), includes forums and e-mails. These tools are characterized by their structure that generates knowledge construction, which poses the need for research and studies, and the textual elaboration of what is requested in activities. That is to say, the student needs previous studies to satisfactorily perform what is required in these virtual environments. Such dynamics must comply with deadlines set by each student, not by the teacher.

- **Advantages:**
  - Immersion in solving a problem or learning one topic at a time can be beneficial for students who wish to devote more time to the subject.
  - In the medium to long term, it fosters proactivity and time management skills
  - Students with possible connection problems would not miss classes
  - Students without Internet access would be able to search for files (on a flash drive, for example) somewhere in the university.

- **Disadvantages:**
  - Students who have difficulty setting and meeting deadlines may be overloaded with work at the end of the semester
  - Teachers must be available to respond to students as soon as demand arises
  - In addition to these two modalities, one can think of mixed schemes. In these, for example, material could be made available asynchronously and face-to-face meetings could be held to clarify doubts during class hours.

Technological resources make possible new ways of perceiving, manipulating and transforming the objects of study, although with certain limitations. They can be used to:
• Access facts, processes, events or data, in a pleasant, synthetic and visual way, facilitating the compression of tedious or complex information (web pages, infographics, videos, etc.);

• Represent knowledge (prepare a report or presentation, using Writer or Impress), a network or concept map (using CmapTools);

• Interact with applications to verify or corroborate laws.

• Analyze relationships between variables.

• Visualize phenomena (creating an animation with Modellus).

Interacting with these resources involves critical thinking and supports different ways of reasoning about the content of the subject. Here, we suggest the use of educational digital technologies as a tool for knowledge construction, thus requiring the student to appeal to analytical and critical ways of thinking, while interacting with them to solve an activity associated with the content of study.

It should be noted that the pedagogical use of all educational resources is conditioned by the teacher’s mastery of the subject matter. In other words, a teacher who "knows the content of the subject" is in a better position to select the resources best suited to the proposed didactic objectives. The resource itself is neither good nor bad, but its relevance in relation to the teacher's proposition is evident, and this is strongly associated with his knowledge in the context of packaging.

It is worth mentioning that not all the proposed resources were selected for the teacher to design activities that include them as available on the Web. In some cases, they are proposed as triggers for pencil-and-paper drawing or laboratory activities. The resources selected for each topic - such as videos, simulators, molecular modelers, infographics - favor the appropriation of abstract concepts, one of the discipline's teaching and learning problems. Simulators and virtual laboratories make it possible to reproduce phenomena and experiences as many times as necessary, which is very useful when the necessary inputs are not available or when the performance requires safety conditions that are not available, or when the student needs to be trained in a practice before performing it in the real laboratory.

On the other hand, it is necessary to include, in the classes, considerations about science and technology, their history and reflections on STS (Science, Technology and Society) relations, aimed at promoting scientific and technological literacy of students. In this sense, several videos are suggested that allow you to solve these problems. The use of images and infographics favors the use of language in lessons, which can serve as a starting point for writing explanatory or informative texts and asking students to use images to create their own infographics. In all cases, resources from Office / OpenOffice / Google Suite for
Education packages can be used: spreadsheets, word processors and slide presentations, among others.

Discipline-specific resources are combined with other general resources, such as a video or still camera and video editors that allow you to film and photograph laboratory experiences, interviews and fieldwork, to develop your own products that show the journey through the construction of school science knowledge. Another general resource that can be used to research ideas from previous students, evaluate a course of instruction, or as a closing activity for the core content is the CmapTools program, which allows the creation of networks and concept maps.

A fundamental aspect is also the teacher’s perception of remote teaching...Higher education teachers about the teaching and learning process in distance classes during the Covid-19 pandemic. As for the positive factors, there is not much to highlight, but some reports point to the reduction of travel expenses; the recording of classes, which are carried out in the three identified modalities, allowing the student to watch as many times as he/she wants and at the time that is most convenient; and the possibility of taking a greater number of disciplines at the same time, due to the low probability of jet lag.

As for the negative points, it was perceived, according to the reports, that there is no effectiveness in any of the methods, since in any methodological strategy used by the teacher, there will always be a part that will be disadvantaged, either by limitation of access, or by difficulty with Information Technologies or by aversion to this type of teaching. It is concluded that the use of the two methods (synchronous and asynchronous) turns out to be the least harmful, because the teacher includes those who can attend, but does not exclude those who cannot. In addition, it provides live moments and facilitates materials and video lectures that the student can view at his convenience. As limitations of the study, it should be noted that only the teachers’ accounts were heard, based on what they heard from the students during the period studied.

Regarding self-regulated learning, according to Panadero (2017), it is a fundamental conceptual framework for understanding the cognitive, motivational, and emotional aspects of learning. Self-regulated learning has made an important contribution to educational psychology since the first articles in which scholars began to distinguish between self-regulated learning and metacognition. In the 1970s, there were discussions in the theoretical field of psychology about aspects that permeate the relationship between memory and learning, deriving the study of metacognition. First defined as the individual’s mastery of his or her own knowledge, in the same decade it was defined as the mastery of cognitive processes and products, which provide control and self-regulation of the intellectual process.
Intellectual self-regulation is possible from metacognition. In this field, research led by Barry Zimmerman was initiated to understand self-regulation or self-regulated learning (SRL), influenced by the constructivist paradigm, which states that the individual is the agent of his or her learning. Zimmerman (2002) affirms that self-regulated individuals are persistent, resolute, strategic, and capable of evaluating their progress, differently from cognitively dependent individuals with little self-regulation. Self-regulation is the individual’s ability to be a ‘self-teacher’. That is, he/she must be able to prepare, facilitate and regulate his/her learning, to generate feedback and judgment on the process. This is observed in the degree of active involvement in the learning process (metacognition, motivation and behavior); cyclical change behavior (effectiveness control, involvement and reflection of results), and dependence on motivational aspects (degree of involvement in relation to controls and beliefs).

The self-regulation model proposed by Zimmerman (2002) is divided into phases, components, and processes, which converge with the objective of producing learning results. The first phase, anticipation/preparation, has the purpose of establishing objectives and strategic plans to achieve the chosen goals. This phase is influenced by motivational aspects, self-efficacy, objectives and learning assessment. The second phase is known as execution and control and its purpose is to achieve the objectives set in the first stage. In this stage, self-control is required using learning strategies and attention control. And finally, the phase of self-reflection and self-reaction, which involves judgment, self-evaluation, and attribution of cause on the objectives established in the first phase. There may be satisfaction or dissatisfaction, presence of reactions (derived from self-reflection) and defensive reactions, with resistance and abandonment, or satisfaction and self-appraisal. This phase is the result of motivational and cognitive constructs where the three phases correspond to a cyclical process, since it takes advantage of previous feedback that allows continuous changes and improvements.

Zimmerman (2002) indicates that self-regulation is built gradually in the individual. Thus, as it is conquered, the dependence on social support that is more required in the traditional method of learning is reduced. In addition to the levels mentioned above, there are phases of self-regulation in the model proposed by Zimmerman. The first includes the pre-phase (planning), also called the cyclic phase. In the second phase, there is performance (realization). Finally, in the third and last phase proposed, there is self-reflection (evaluation). In this way, in the end, it will promote a differentiated understanding among the evaluated, thus being a unique, dynamic and cyclical way of operating. In this context, some possible strategies that are most replicated by self-regulated students were identified. Regarding the Self-regulated Learning Dimensions.
Dimension 1: Planning phase

The first dimension of the variable is the "planning phase". According to Bocanegra and Navarro (2017), it is in this stage that students decide what and how they will proceed to achieve their goal, which they must take ownership of. This phase presents the following subprocesses: goal setting, strategic planning, self-efficacy beliefs, outcome expectancy, and intrinsic interest or perception of the value of the task.

Dimension 2: Execution phase

The second dimension, called "execution phase", according to Bocanegra and Navarro (2017), stands out from the perspective of self-regulated learning, because it informs students about their progress and deficiencies in relation to goals. Through this, the student can change his or her behavior or modify the environment and, thus, adjust courses of action to achieve the established goal.

Dimension 3: Self-reflection phase

As a third dimension, there is the "self-reflection phase". For Bocanegra and Navarro (2017), students who self-regulate their learning tend to attribute their failure to modifiable factors and show themselves capable of adapting their study procedures to more complex tasks, since they evaluate their performance more regularly and adequately, which constitutes the third subprocess of this phase. Likewise, regarding the strategies present in self-regulated students, Zimmerman and Martinez-Ponz (1986) identified ten strategies present in self-regulated students. For these authors, the use of these strategies provides the student with a valuable tool; their use is highly correlated with academic success rates and with the teachers' opinion of their degree of self-regulation in the classroom.

1. Self-assessment: statements that indicate students' evaluations of the quality or progress of their work ("I checked my work to make sure it was okay").

2. Organization and transformation: statements indicating students' initiatives to reorganize, improve, learning materials ("I always make a diagram before reporting Chemistry experiments").

3. Goal setting and planning: statements indicating educational goal setting: planning, phasing over time, and carrying out activities related to these goals ("I start studying two weeks before tests and I am rested").

4. Information seeking statements indicating students' efforts to acquire extra information from non-social sources when faced with a school assignment ("Before starting an assignment, I go to the school library to gather as much information about the topic").
5. Note-taking: statements indicating efforts to record events and outcomes ("In class I take as many notes as possible on what the teacher gives").

6. Environmental structure: statements that indicate efforts to select or change the physical or psychological environment to promote learning.

7. Self-consequences: statements that indicate imagination or the application of rewards or punishments for school success or failure ("If I do well on the test, I offer myself some ranks").

8. Repetition and memorization: statements that indicate students' initiatives and efforts to memorize material ("When I prepare for a physics exam, I write the formula many times, until I know it by heart").

9. Social help-seeking: statements that indicate students' initiatives and efforts to seek help from peers, teachers, and adults. For example, "if I have difficulties studying, I ask my father, who is a doctor, for help".

10. Reviewing data statements: indicating student initiative efforts to review grades, tests, textbooks to prepare for a class or written assignment.

Finally, if traditional versus self-regulated learning is assessed on a historical basis, it can be noted that traditional methodology has been addressed even before the 19th century. Thus, progressive movements in favor of education emerged, called Escola Nova, which designed new teaching practices that aimed at the student as the protagonist of his own training. This movement had important representatives in the field of education: John Dewey (1859-1952), Maria Montessori (1870-1952), Henri Wallon (1879-1962), Célestin Freinet (1881-1966), Lev Vygotsky (1896-1934), Jean Piaget (1897-1980), among others who developed innovative educational experiences, which were opposed to the current traditional model of education (Castro et al., 2021).

The traditional methodology differs mainly from the self-regulated methodology because it treats the student passively in the teaching-learning process. In this way, the above brings the teacher as an active figure, so that he is the one who reviews the content to be addressed and, consequently, does not generate reflective thinking, so the student plays a passive role in learning and obtains a greater informative characteristic (Castro et al., 2021). In contrast, in self-regulated learning, the mediating subject of teaching is the teacher, who seeks to guide his students to verify their learning through an evaluative process, which may have a formal or informal aspect, in addition to transmitting his due evaluations about it and interfering with the corrective guidelines (Castro et al., 2021).
Methodology

The study was framed in quantitative approach, according to Hernández et al. (2014), the fundamental characteristics of quantitative methods are the orientation towards quantification and the cause of phenomena, the absence of concern for subjectivity, the use of controlled methods, the objectivity sought through a distance from the data, the orientation towards verification, orientation towards results. Type of research was applied, this type of research, according to the authors Hernández et al. (2014), is distinguished by having well-defined immediate practical purposes, i.e., research is conducted to act, transform, modify, or produce changes in a certain sector of reality and the study according to its design was quasi-experimental.

The sample consisted of two classrooms, I1 = 41 students Experimental group and I2 = 38 students Control group, selected by non-probabilistic sampling, because, being a quasi-experimental research, the groups are already formed previously, and the groups were taken intact. The survey was used as a technique and the self-regulated learning questionnaire by Gordon et al. (1996) was used as an instrument, with a content validity of 0.92 and a Cronbach’s Alpha reliability of 0.92.

Results

Due to the nature of the study, inferential results have been weighted for this study, the first one refers to the statistical test for the determination of normality. According to the results:

H0: There are no significant differences between the ideal distribution and the normal distribution of the data.

H1: There are significant differences between the ideal distribution and the normal distribution of the data.

Table 1 Normality test

<table>
<thead>
<tr>
<th></th>
<th>Kolmogorov-Smirnov Statistic</th>
<th>gl</th>
<th>sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-regulated learning Pre-test</td>
<td>0.159</td>
<td>79</td>
<td>0.000</td>
</tr>
<tr>
<td>Self-regulated learning Postest</td>
<td>0.152</td>
<td>79</td>
<td>0.000</td>
</tr>
</tbody>
</table>

If alpha (Sig) > 0.05; The null hypothesis is accepted.
If alpha (Sig) < 0.05; the null hypothesis is rejected.

The value of 0.000 and 0.000; H0 is rejected and H1 is accepted, the results come from a normal distribution.
Figure 1. Frequency distribution of self-regulated learning test scores in the pre-test.

The figures show that the results obtained for the self-regulated learning variable do not come from a normal distribution; therefore, non-parametric statistics such as the Mann Whitney U statistic will be used to test the hypothesis.

Step 1: Statistical hypothesis statement

H1 There is a significant influence of the proposal based on remote teaching on self-regulated learning in the students of Initial Education of the UNE, 2022.
H0 There is no significant influence of the proposal based on remote teaching on self-regulated learning in the students of Initial Education of the UNE, 2022.

Step 2: Decision rule

Research hypothesis is accepted if and only if $p < 0.05$.

Null hypothesis is accepted if and only if $p > 0.05$.

Step 3: Mann-Whitney U statistical test

**Table 2 Difference of ranks in the two groups**

<table>
<thead>
<tr>
<th>Groups</th>
<th>N</th>
<th>Average range</th>
<th>Sum of ranges</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-test: Self-regulated learning</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experimental group</td>
<td>41</td>
<td>35.71</td>
<td>1464.00</td>
</tr>
<tr>
<td>Control group</td>
<td>38</td>
<td>44.63</td>
<td>1696.00</td>
</tr>
<tr>
<td>Total</td>
<td>79</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Post-test: Self-regulated learning</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experimental group</td>
<td>41</td>
<td>55.55</td>
<td>2277.50</td>
</tr>
<tr>
<td>Control group</td>
<td>38</td>
<td>23.22</td>
<td>882.50</td>
</tr>
<tr>
<td>Total</td>
<td>79</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Table 3 Mann-Whitney U test for independent samples**

<table>
<thead>
<tr>
<th></th>
<th>Pre-test: Self-regulated learning</th>
<th>Post-test: Self-regulated learning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mann-Whitney U test</td>
<td>603.000</td>
<td>141.500</td>
</tr>
<tr>
<td>Wilcoxon W</td>
<td>1464.000</td>
<td>882.500</td>
</tr>
<tr>
<td>Z</td>
<td>-1.733</td>
<td>-6.260</td>
</tr>
<tr>
<td>Asymptotic significance (bilateral)</td>
<td>,000</td>
<td>,000</td>
</tr>
</tbody>
</table>

Step 4: Interpretation

Table 1 and 2 represent the results in comparison of pre-test and posttest in both groups using the Whitney Mann U statistic; firstly in the pre-test it is deduced that the application of the proposal based on remote teaching does not positively influence self-regulated learning in students, because the result found between the groups gives a result that corresponds to $Z = -1.733$ and $p$-value greater than 0.05, also locating that average rank in the GE is equal to 35.71 in reference to the average rank of the CG which is equal to 44.63; however, after applying the proposal based on remote teaching in the posttest differences were found that are considered highly significant, with a Z value = -6.260 and a $p$-value less than 0.05 that favors the GE, obtaining an also, an average rank equal to 55.55 value greater than that obtained by the CG equal to 23.22). Therefore, the Ho is rejected, and the Ha is accepted, proving that the application of the proposal based on remote teaching positively influences self-regulated learning in the students of Initial Education of the UNE, 2022.

Under these results, it is appreciated that the GE presents greater conditions and better development of self-regulated learning, this is due to the application of the proposal based on remote teaching. It is concluded that the application of the proposal based on remote
teaching significantly improves the development of self-regulated learning in the students of Initial Education of the UNE, 2022.

Specific hypothesis 1

Step 1: Statistical hypothesis statement

H1 There is a significant influence of the remote teaching-based approach in the planning phase.

H0 There is no significant influence of the remote teaching-based approach in the planning phase.

Step 2: Decision rule

Research hypothesis is accepted if and only if \( p < 0.05 \).

Null hypothesis is accepted if and only if \( p > 0.05 \).

Step 3: Mann-Whitney U statistical test

Table 4 Difference of ranks in the two groups

<table>
<thead>
<tr>
<th>Groups</th>
<th>N</th>
<th>Average range</th>
<th>Sum of ranges</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-test: Planning phase</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experimental group</td>
<td>41</td>
<td>37.20</td>
<td>1525.00</td>
</tr>
<tr>
<td>Control group</td>
<td>38</td>
<td>43.03</td>
<td>1635.00</td>
</tr>
<tr>
<td>Total</td>
<td>79</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Post-test: Planning phase</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experimental group</td>
<td>41</td>
<td>56.55</td>
<td>2318.50</td>
</tr>
<tr>
<td>Control group</td>
<td>38</td>
<td>25.14</td>
<td>841.50</td>
</tr>
<tr>
<td>Total</td>
<td>79</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 5 Mann-Whitney U test for independent samples

<table>
<thead>
<tr>
<th></th>
<th>Pre-test: Planning phase</th>
<th>Post-test: Planning phase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mann-Whitney U test</td>
<td>664.000</td>
<td>100.500</td>
</tr>
<tr>
<td>Wilcoxon W</td>
<td>1525.000</td>
<td>841.500</td>
</tr>
<tr>
<td>Z</td>
<td>-1.135</td>
<td>-6.670</td>
</tr>
<tr>
<td>Asymptotic significance (bilateral)</td>
<td>.000</td>
<td>.000</td>
</tr>
</tbody>
</table>

Step 4: Interpretation

Table 4 and 5 represent the results in comparison of the pretest and posttest in both groups using the Whitney Mann U statistic; firstly in the pretest it is deduced that the application of the proposal based on remote teaching does not positively influence the planning phase, because the result found between the groups gives a result that corresponds to \( Z = -1.135 \) and \( p \)-value greater than 0.05, also locating that average rank in the GE is equal to 37.20 in reference to the average rank of the CG which is equal to 43.03; however, after applying the proposal based on remote teaching in the post-test differences were found that are considered highly significant, with a \( Z \) value = -6.670 and a \( p \)-value less than 0.05 that favors the GE, also obtaining an average rank equal to 56.55 (value greater than that obtained by the CG equal to 22.14). Therefore, the Ho is rejected, and the Ha is accepted, proving that the application of the proposal based on remote teaching positively
influences the planning phase in the students of Initial Education of the UNE, 2022.

Under these results, the GE presents better conditions and a better development of the planning phase, this is due to the application of the proposal based on remote teaching. It is concluded that the application of the proposal based on remote teaching significantly improves the planning phase in the students of Initial Education of the UNE, 2022.

Specific hypothesis 2

Step 1: Statistical hypothesis statement

\( H_1 \) There is a significant influence of the remote teaching-based approach in the implementation phase.

\( H_0 \) There is no significant influence of the remote teaching-based approach on the implementation phase.

Step 2: Decision rule

Research hypothesis is accepted if and only if \( p < 0.05 \).

Null hypothesis is accepted if and only if \( p > 0.05 \).

Step 3: Mann-Whitney U statistical test

**Table 6 Difference of ranks in the two groups**

<table>
<thead>
<tr>
<th>Groups</th>
<th>N</th>
<th>Average range</th>
<th>Sum of ranges</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-test: Execution phase</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experimental group</td>
<td>41</td>
<td>38,24</td>
<td>1568,00</td>
</tr>
<tr>
<td>Control group</td>
<td>38</td>
<td>41,89</td>
<td>1592,00</td>
</tr>
<tr>
<td>Total</td>
<td>79</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Post-test: Execution phase</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experimental group</td>
<td>41</td>
<td>52,96</td>
<td>2171,50</td>
</tr>
<tr>
<td>Control group</td>
<td>38</td>
<td>26,01</td>
<td>988,50</td>
</tr>
<tr>
<td>Total</td>
<td>79</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Table 7 Mann-Whitney U test for independent samples**

<table>
<thead>
<tr>
<th></th>
<th>Pre-test: Execution phase</th>
<th>Post-test: Execution phase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mann-Whitney U test</td>
<td>707,000</td>
<td>247,500</td>
</tr>
<tr>
<td>Wilcoxon W</td>
<td>1568,000</td>
<td>988,500</td>
</tr>
<tr>
<td>Z</td>
<td>-.713</td>
<td>-5.225</td>
</tr>
<tr>
<td>Asymptotic significance (bilateral)</td>
<td>.000</td>
<td>.000</td>
</tr>
</tbody>
</table>

Step 4: Interpretation

Table 6 and 7 represent the results in comparison of pretest and posttest in both groups using the Whitney Mann U statistic; firstly, in the pretest it is deduced that the application of the proposal based on remote teaching does not positively influence the execution phase, because the result found between the groups gives a result that corresponds to \( Z = -.713 \) and \( p \)-value greater than 0.05, also locating that average rank in the GE is equal to 38.24 in reference to the average rank of the CG which is equal to 41.89; however, after applying the proposal based on remote teaching in the post-test differences were
found that are considered highly significant, with a Z value = -5.225 and a p-value less than 0.05 that favors the GE, also obtaining an average rank equal to 52.96 (value greater than that obtained by the CG equal to 26.01). Then the Ho is rejected, and the Ha is accepted where it is proved that the application of the proposal based on remote teaching positively influences the execution phase in the students of Initial Education of the UNE, 2022.

Under these results, it is appreciated that the GE presents greater conditions and a better execution phase, this is due to the application of the proposal based on remote teaching.

Step 5: Statistical conclusion

It is concluded that the application of the proposal based on remote teaching significantly improves the level of the execution phase in the students of Initial Education of the UNE, 2022.

Specific hypothesis 3

Step 1: Statistical hypothesis statement

Hi There is a significant influence of the proposal based on remote teaching in the self-reflection phase.

H0 There is no significant influence of the remote teaching-based approach in the self-reflection phase.

Step 2: Decision rule

Research hypothesis is accepted if and only if p < 0.05.

Null hypothesis is accepted if and only if p > 0.05.

Step 3: Mann-Whitney U statistical test

<table>
<thead>
<tr>
<th>Groups</th>
<th>N</th>
<th>Average range</th>
<th>Sum of ranges</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-test: Self-reflection phase</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experimental group</td>
<td>41</td>
<td>36,37</td>
<td>1491,00</td>
</tr>
<tr>
<td>Control group</td>
<td>38</td>
<td>43,92</td>
<td>1669,00</td>
</tr>
<tr>
<td>Total</td>
<td>79</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Post-test: Self-reflection phase</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experimental group</td>
<td>41</td>
<td>55,27</td>
<td>2266,00</td>
</tr>
<tr>
<td>Control group</td>
<td>38</td>
<td>23,53</td>
<td>894,00</td>
</tr>
<tr>
<td>Total</td>
<td>79</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 9 Mann-Whitney U test for independent samples

<table>
<thead>
<tr>
<th></th>
<th>Pre-test: Self-reflection phase</th>
<th>Post-test: Self-reflection phase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mann-Whitney U test</td>
<td>630,000</td>
<td>153,000</td>
</tr>
<tr>
<td>Wilcoxon W</td>
<td>1491,000</td>
<td>894,000</td>
</tr>
<tr>
<td>Z</td>
<td>-1,492</td>
<td>-6,177</td>
</tr>
<tr>
<td>Asymptotic significance (bilateral)</td>
<td>.000</td>
<td>.000</td>
</tr>
</tbody>
</table>

Step 4: Interpretation
Table 8 and 9 represent the results in comparison of pretest and posttest in both groups using the Whitney Mann U statistic; firstly, in the pretest it is deduced that the application of the proposal based on remote teaching does not positively influence the self-reflection phase, because the result found between the groups gives a result that corresponds to $Z = -1.492$ and $p$-value greater than 0.05, also locating that average rank in the GE is equal to 36.37 in reference to the average rank of the CG which is equal to 43.92; however, after applying the proposal based on remote teaching in the post-test differences were found that are considered highly significant, with a $Z$ value = -6.177 and a $p$-value less than 0.05 that favors the GE, also obtaining an average rank equal to 55.27 (value greater than that obtained by the CG equal to 23.53). Then the Ho is rejected, and the H1 is accepted where it is proved that the application of the proposal based on remote teaching positively influences the self-reflection phase in the students of Initial Education of the UNE, 2022.

Under these results, it is appreciated that the GE presents greater conditions and a better self-reflection phase, this is due to the application of the proposal based on remote teaching. It is concluded that the application of the proposal based on remote teaching significantly improves the self-reflection phase in the students of Initial Education of the UNE, 2022.

Discussion

The present research had the objective of determining the influence of the proposal based on remote teaching on self-regulated learning in the students of Initial Education at UNE, 2022, at the end of the analysis, it could be noted that, among the students surveyed, it stands out that a unanimous opinion is that it is more advantageous to work in a face-to-face manner. However, the only way to ensure the study and teaching of these students was precisely to give up this close contact to make way for a totally distance learning. The problems caused by this period will continue to show themselves over the years. However, with good practices and professionals dedicated to teaching students better and better, it is possible to approach the normality that existed before the pandemic.

It is therefore incumbent upon future and already active teachers to pay attention to the educational problems caused by the pandemic. During the writing of this paper, the progress of the class in question was closely monitored. Furthermore, it could be concluded that the students were well followed up by the pedagogical team. Therefore, they managed to pass the remote period to alleviate all the problems caused by the pandemic. The COVID-19 pandemic entered the history of
mankind, marking a time when technologies will never cease to accompany the academic life of teachers and students.

In this sense, it was found that the proposal based on remote teaching significantly improves self-regulated learning in early childhood education students at UNE, 2022. It was demonstrated that there are significant differences between the results obtained by the subjects of the experimental group and the control group in self-regulated learning after the application of the remote teaching proposal ($z = -6.260$, $p < 0.05$), in order to strengthen the support of this result it was necessary to make the comparison with the study conducted by Guarniz (2021), who with a result of 0.871 in the significance level of Spearman's hypothesis test, which means that there is a positive significant link. At the international level, similar studies were also carried out on these variables that can serve as support for sustenance, such is the case of Gaeta et al. (2021), where they stated that a positive influence was found in the self-efficacy applied to face stress and positive emotions in the self-regulation of students' learning, likewise, it was found that it depends a lot on the age and gender that these emotions are present.

For their part, Moreno and Pérez (2021) conclude that the academic performance of students is favorable while students obtain more metacognitive skills in their development, and it occurs through the phases of self-regulated learning. Therefore, the role of the teacher in the context of the pandemic has undergone significant changes while retaining its importance. Although ICTs offer an infinite universe of content, only the professional teacher is capable of filtering what is relevant for teaching and student learning. In this sense, the role of the teacher is fundamental, even in the face of so many changes brought about by technology. As a result of the pandemic, it was necessary to adapt the teaching-learning process with the help of ICT, even during the difficulties derived from this flawed system, the education of thousands of students was made possible. As a methodological approach, it was decided to carry out the study under the deductive scientific method. The deductive method, in turn, proved to be fundamental for the selection and confrontation of the thematic proposal. Still in terms of the approach, the research is characterized by being endowed with a qualitative aspect; in relation to the objectives, exploratory research; in terms of the temporal delimitation, it is a research based on retrospective studies.

Regarding the research techniques, for the procedural framework, it is a bibliographic review under the systematic format, whose cut and collection of material carefully obeyed the correlation and adherence of the selected materials with the central content discussed. For this purpose, in addition to the traditional theoretical contributions related to the discipline in question, the Google Scholar and Scielo platforms were used as the basis for searches and selections.
The proposal based on remote teaching significantly improves the planning phase in students of the Faculty of Initial Education of UNE, 2022. It was shown that there are significant differences between results obtained by the subjects of the experimental group and the control group in motivation after the application of the remote teaching proposal \(z = -6.670, p < 0.05\). In order to strengthen the support of this result, it was necessary to make the comparison with the study conducted by Arcujaulla et al. (2021), where the authors stated that the evaluated students managed to reinforce the self-regulation of their learning of the course, by means of the inverted classroom model, at an international level. Similar studies were also carried out on these variables that can serve as support for the support, as in the case of Castro et al. (2021), where they conclude that it is very important to propose techniques to improve self-regulation, teamwork and student incentive, and there must also be a feedback developed by the teacher, in order to be clear about teaching in this modality and these times.

In this sense, the teacher's work in the Covid-19 pandemic permeates the concepts of protagonist, mediation, didactic transposition, and curatorship. The so-called protagonist refers to the process of receiving guidance, through the teacher who encourages the student to learn through situations and challenges. The student can lead the learning process as long as he/she has someone to mediate this process and, here, the fundamental role of the teacher is evident. The protagonist refers to the student's participation in the material produced by the teacher; the model in which classes must be ready to be consumed must be abandoned, encouraging the students to work together with the teachers in the sense of creativity and critical thinking.

The proposal based on remote teaching significantly improves the execution phase in the students of the Faculty of Initial Education of the UNE, 2022. It was demonstrated that there are significant differences between the results obtained by the subjects of the experimental group and the control group, in self-planning, after the application of the remote teaching proposal \(z = -5.225, p < 0.05\). In order to strengthen the support of this result, it was necessary to make a comparison with the study conducted by Muñoz (2021), who stated that the results showed a coefficient of 0.956. He also concluded that there is a positive influence, so we can say that, if there are better evaluative rubrics, there will also be a better self-regulation of learning in students. At the international level, similar studies were also carried out on these variables that can serve as a support for sustenance, such is the case of Tello et al. (2021), where they conclude that there is a high link between the two variables. This means that, to the extent that the student possesses a better degree of resilience, he will have a better level of self-regulation of his learning compared to his peers.
Thus, the phenomenon of the use of Information and Communication Technologies (ICT), as auxiliary mechanisms of education, can be seen, which predates the pandemic. What generated the pandemic crisis and social isolation was to abruptly create a scenario where distance learning became the only viable solution. These technological mechanisms should not be seen as enemies of traditional education, but as aids in the teaching-learning process. Apart from that, education and, mainly, educators cannot remain stagnant in time, the implementation of the use of ICT requires a continuous training process on the part of teachers.

The proposal based on remote teaching significantly improves the self-reflection phase in the students of the Faculty of Initial Education of the UNE, 2022. It was demonstrated that there are significant differences between the results obtained by the subjects of the experimental group and the control group in self-regulation after the application of the remote teaching proposal \((z = -6.177, p < 0.05)\). In order to strengthen the support of this result, it was necessary to make the comparison with the study conducted by Cruzado (2021), where he concludes that the evaluated students have high degrees of self-regulation. However, after applying the Chatbot as a learning support, this self-regulation increased. This means that this tool, when used properly, offers optimal results. At the international level, similar studies have also been carried out on these variables, which can serve as a support for sustenance. This is the case of Infante et al. (2021), who conclude that 27 technological apps were found that help self-regulation of learning. The most relevant are Whatsapp and Google Calendar, which are also recommended by most university teachers.

In addition to the above, the deep socioeconomic inequality present in reality is a challenge to guarantee the right to education and, above all, in the teaching model that uses ICTs, these technologies are not part of the reality of the poorest. Implementing the use of ICTs in the teaching-learning process depends on combating inequality, or at least on policies that minimize its effects. The COVID-19 pandemic, therefore, opened up inequality in education. Thus, some students adapted, with less difficulty, to the implementation of distance learning, as they are accustomed to using the latest smartphones, tablets, computers, etc. Others, however, do not even have access to the basics to adapt to the "new normal". This is the situation of a vulnerable population, whose access to the school environment also implied having school lunches as an important source of the daily food table, often being the only daily meal.

The discussion on an educational model that uses ICTs as an ally must therefore permeate the debate on socioeconomic inequality. A positive aspect of emergency remote teaching is the environment on the part of students and teachers, a better command of these technologies is
fundamental to make the teaching-learning process viable. In one way or another, the future of education is linked to information technologies, the teaching professional will continue to be fundamental, however, he/she will have to master this new educational model.

Conclusions

The proposal based on remote teaching significantly improves self-regulated learning in Early Childhood Education students at UNE, 2022. It was demonstrated that there are significant differences between results obtained by the subjects of the experimental group and the control group in self-regulated learning after the application of the remote teaching proposal (z = -6.260, p < 0.05).

The proposal based on remote teaching significantly improves the planning phase in the students of the Faculty of Initial Education of UNE, 2022. It was shown that there are significant differences between results obtained by the subjects of the experimental group and the control group in motivation after the application of the remote teaching proposal (z = -6.670, p < 0.05).

The proposal based on remote teaching significantly improves the execution phase in the students of the Faculty of Initial Education of UNE, 2022. It was shown that there are significant differences between results obtained by the subjects of the experimental group and the control group in self-planning after the application of the remote teaching proposal (z = -5.225, p < 0.05).

The proposal based on remote teaching significantly improves the self-reflection phase in the students of the Faculty of Initial Education of UNE, 2022. It was shown that there are significant differences between results obtained by the subjects of the experimental group and the control group in self-regulation after the application of the remote teaching proposal (z = -6.177, p < 0.05).

Bibliography


