education sciences

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Educational Innovation in Adult Learning Considering Digital Transformation for Social Inclusion

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Abstract: This research seeks to identify teaching-learning mechanisms that allow innovation and educational evolution for Youth and Adult Basic Education and thus achieve social inclusion in a rural development environment that has technological limitations and internet access in rural areas. The work seeks to identify a strategic process of learning objects to apply an inverted classroom in no presential modality. The objective is to respond to the low level of knowledge in the area of Language and Literature to mitigate the lack of understanding of the andragogical resources of the teachers in virtual classes. A methodological strategy is proposed that is related to the scientific field through bibliometric and quantitative analysis based on scientific information; in a second moment, the environment is evaluated via satisfaction surveys conducted with students and teachers of the third baccalaureate of the rural areas in the no presential modality of the Juan Jiménez Educational Unit, Abdón Calderón extension, province of Sucumbíos, Ecuador. A total of 66.67% of teachers between 41 and 45 agree with implementing ICT as a strategy for better learning in the education of young people and adults despite the scarce access to the internet in rural areas.

Keywords: adult online learning; education innovation; disruptive education; digital transformation; andragogy; ICT

Citation: Ramírez, A.; Inga, E. Educational Innovation in Adult Learning Considering Digital Transformation for Social Inclusion. *Educ. Sci.* **2022**, *12*, 882. https://doi.org/10.3390/educsci12120882

Academic Editor: Rustam Shadiev

Received: 17 October 2022
Accepted: 28 November 2022
Published: 1 December 2022

1. Introduction

Primary Education for Youth and Adults (BEYA) has focused its interest on the transcendent topic of popular or unfinished education. Consequently, its value is having a specialized curriculum for people with incomplete education in all dimensions of the planet. There are practical experiences and legislations developed to improve the quality of education; however, we need to respect the equality of their rights within the legal framework and advanced experiences for this population that aspires to a better quality of life [1,2].

Among the goals is to help prevent attitudes that discriminate, segregate and hinder through structural or technological barriers. These factors have limited the advancement and development to actively participate in an environment of equality and social justice to promote lifelong popular education [3].

The methodology, instruments, and andragogical learning strategies appropriate to different realities are made possible through targeted curricular adaptations [4].

The evolution of andragogy for education, social inclusion, and rural development intrinsically considers the learning objects according to the needs and problems, where learning is collaborative work, life experiences, strategies, and new ways of educating to innovate and evolve the educational field [5]. However, several factors must be considered,

such as socio-economic, cultural, environmental, academic, labor, and family, so they do not become a barrier.

These factors allow participants to acquire the learning material and study in their free time, developing academic training that will enable them to strengthen through models based on technology applied to various projects and problems [6].

The experience of parents, the mass and alternative media available for teachers to adapt specific andragogical strategies, guide adults with certainty flexibility, and plan content and activities is added to this learning according to the interest of developing community projects in marginal rural areas [7,8].

The material achieved will allow revision in the time available and at the pace of each participant. They also have the option of having informative material, such as social networks, within their reach according to the reality, social, and geographical environment where they reside will be essential to consider [9,10].

In recent decades, it has become a challenge in the absence of inclusive government policies to promote equitable education framed in social justice. In this way, it is necessary to propose a strategy to encourage spaces of improvement for people with incomplete schooling, who, due to different situations of dysfunctional families and social strata, have lived complex realities in times of the pandemic [11].

The use of virtual classes in different platforms to which the rural population does not have access from other realities to overcome the adversities of learning to live together requires innovation to traditional styles through tools and media available in this modality [12,13].

Teachers must also develop their creativity by proposing tools, experimenting, and adapting them to reality according to learning situations mediated by ICT [14].

It will be challenging to provide comprehensive teaching that meets the educational needs of rural students due to the lack of connectivity, electronic devices, andragogy, and flexible teaching resources. These elements are necessary for the objective to be achieved, and there is still a need for pedagogical advice for students who need help accessing connectivity. On the other hand, the teaching task is duplicated to elaborate and deliver manual didactic materials with an orientation guide to develop learning projects for students in the semi-presential educational system [15].

There are cases where the continuity of the virtual educational process is sought and where students opt for the need to travel to inaccessible workplaces where they lose the pace of learning, where there is even no access to WhatsApp or other social networks, and where students prefer to submit assignments in physical form. Finally, Figure 1 shows the learning objects of the BEYA application.

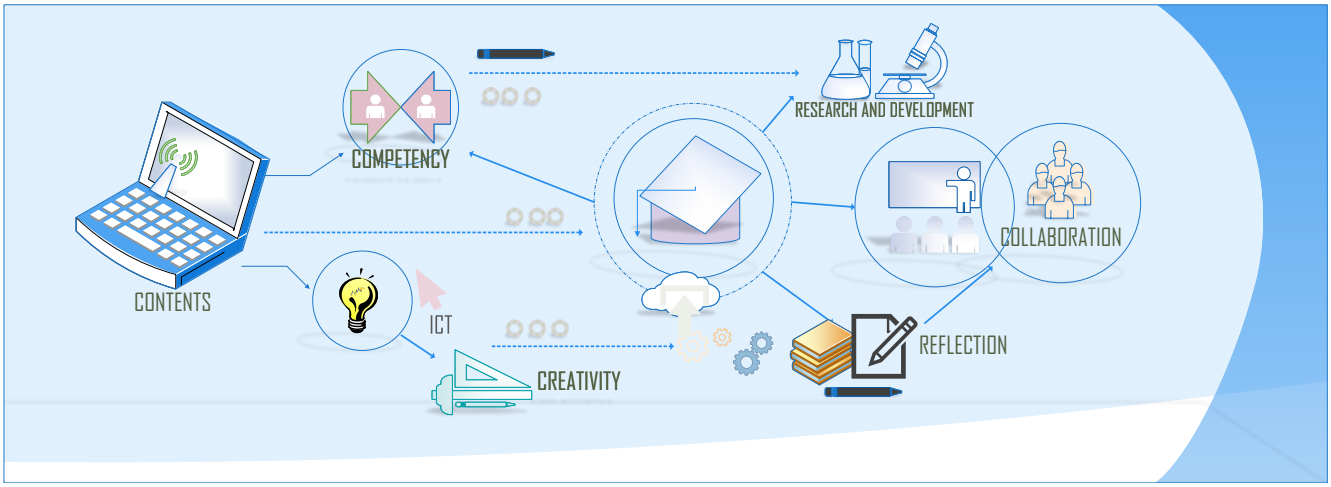


Figure 1. Learning Objects and Inverted Classroom. Source: Authors.

2. Related Works

Authors such as [16] argue that educational evolution and innovation can impact BEYA to contrast problems and needs of a specific geographic area; in addition, it raises proposed solutions from several types of research.

In [14], scientific articles that propose theories that achieve efficiency in times of resilience are commented on for their effectiveness in academic management. It guarantees efficiency in learning and takes into account the what, how, and where of experiences gained in countries with scientific expertise with a motivational human capital expert in raising self-esteem in human capital to devise an effective method of flipped learning or blended learning, which has overcome language barriers and ubiquitous learning.

From the teachers' point of view, it is observed that the methodology does not give results because they continue with traditional education, responding to established formats of inadequate standard theoretical policies [17].

However, different technological tools are found within the virtual world, adapted to students with low internet connectivity classes, such as YouTube, Google academic, Google Sites, and text links. A student could access BEYA learning and learning testimonials in their daily life, which are offered for strategic populations with no cost and are not quality and time-limited [18].

The internet offers excellent opportunities for individuals to educate themselves, strengthen their knowledge system personally, and access research methods related to learning to make their own learning decisions considering their vision and future training goals [19].

Motivation to be professionals is the key to empowering the daily experience of developing innovative practices in implementing community educational projects of experimentation or integrated knowledge learning and community learning circles. It is a trend of greater reach for the population because they have it at hand and can use it whenever they see fit [20].

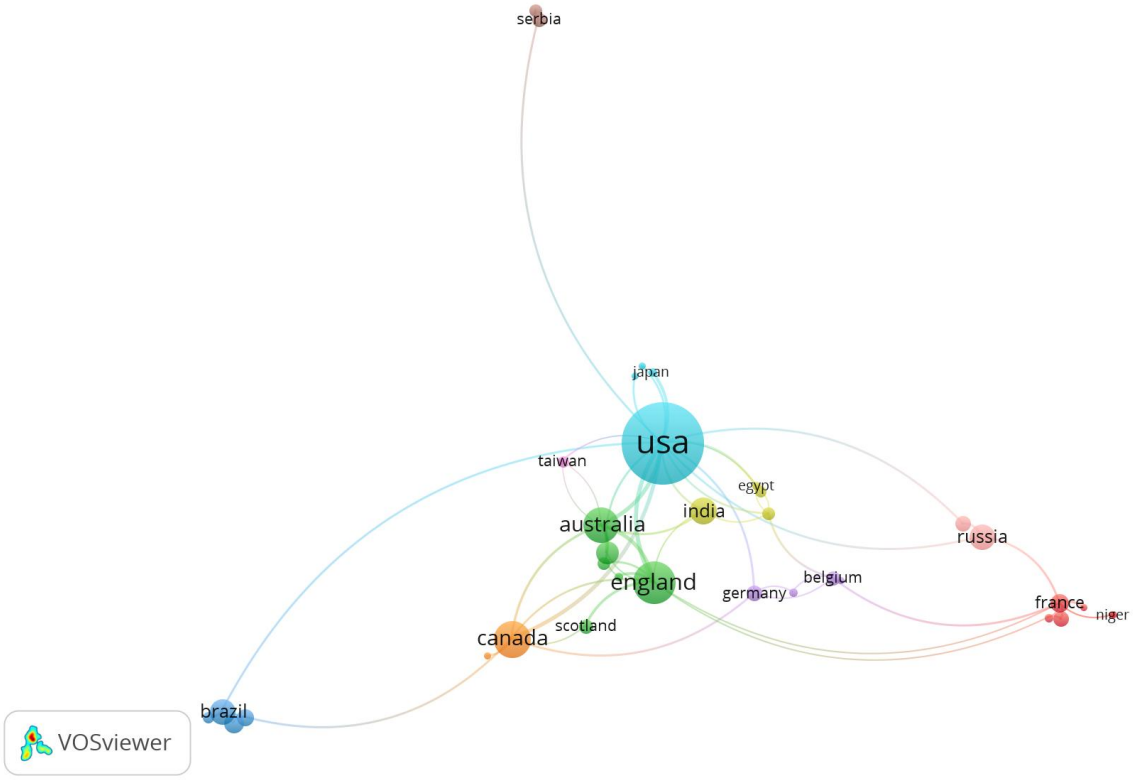
The student population needs more connectivity and alternative ways to use WhatsApp and Telegram to work on applications for better meaningful learning, and the lack of interest in specific strategies is a point of incidence and attraction to the passion for learning. Another element within the institution has implemented a virtual platform, EDUMAX, for teachers to conduct virtual classes through this tool [21,22].

There are digital tools available to the student population as a complement to learning, this methodology and online teaching could significantly impact personalized education and improve learning opportunities. Students will be able to express their progress and progressive learning in developing projects that they originate from time to time and acquire skills and abilities because they cultivate them in the practice of their family and community environment [23,24].

In addition, students can communicate to strengthen the processes and experiences and overcome doubts from the experiences located in the learning of new knowledge by updating and framing the process of andragogy in virtual and non-virtual learning environments using appropriate learning objects to achieve the interest of BEYA [25,26].

Figure 2 shows the graph of the bibliometric analysis carried out with the database obtained from the Web of Science and Scopus using the free-access software VosViewer, which relates to andragogical education and innovative models of countries and universities that have achieved greater recognition in the scientific field of inclusive education and countries with which they are linked to attaining new contributions.

Table 1 presents the state-of-the-art regarding the problems related to adult learning and the approaches discussed by some authors. Among some of the questions raised in the research is the concern of knowing if the teacher favors a change in the learning model from pedagogy to andragogy when it comes to adult learners and if the use of ICT is genuine. Consequently, it can be an acceptable way to improve performance and motivation in learning. In the table, the check shows the existence of an exploration of the topic and a hyphen, implying that this research will not notice it.



(**a**) Web of Science—Countries

(**b**) Scopus—Universities

Figure 2. Bibliometric Analysis Network map showing relationships between various countries and universities Andragogy, Rural Development —(**a**) Web of Science. (**b**) Scopus. Source Authors.

The present research incorporates restrictions, such as the rural area where adult students are concentrated, which becomes the reason and the interest of the current work. In addition, the possibility of incorporating a problem-based learning approach is noted since education in a rural sector seeks added value for its professional development and with solutions according to the context in which they develop.

Is it feasible to incorporate a strategy in rural areas that motivates and increases adult learners' learning around the needs of their context?

Previous works have proposed theoretical alternatives for an andragogic approach; however, when connectivity or lack of internet in a rural area occurs, the teacher demands educational innovation strategies to face this reality.

Table 1. Summary of related works.

Author, Year	Objectives	Parameters Considered					Thematic	
		Rural Zones	Learning Learning	Innovation Innovation	Connectivity	ICT	Andragogy	Learning Learning
Ng, 2022 [23]	Gamification and Inverted Learning in adult learning (postgraduate)	-	-	-	✓	✓	-	-
Tezcan, 2022 [9]	Andragogical Principles—Certification of Learning	-	-	-	-	-	✓	-
Purwati2022, 2022 [12]	Differences between andragogy and pedagogy	✓	✓	-	-	-	✓	-
Lu, 2022 [27]	Factors and strategies influencing adult online learning	-	✓	-	✓	-	✓	-
Cueva, 2022 [1]	ICT used and benefits for students and achieving meaningful learning	-	✓	✓	✓	✓	-	✓
Desta, 2022 [2]	Application of andragogy in Integrated Functional Adult Education	-	-	-	✓	✓	-	-
Sabri, 2022 [3]	Level of acceptance of mobile learning	-	✓	-	-	✓	✓	-
Sabri, 2022 [6]	State-of-the-art on mobile learning	-	✓	-	-	✓	✓	-
Ritonga, 2022 [5]	Duolingo as a platform for teaching	-	-	✓	✓	✓	-	-
Abedini, 2021 [17]	Characteristics and what may facilitate or hinder adults' engagement	-	✓	✓	✓	✓	✓	-
Yangari, 2021 [7]	Educational innovation in the evaluation processes within the FL	-	-	✓	✓	✓	-	✓
Souza-Correa, 2021 [11]	Reflection group process with adolescents	-	✓	✓	-	✓	✓	-
Present work	Planning and sizing of electrical distribution network	✓	✓	✓	✓	✓	✓	✓

3. Problem Formulation and Methodology

3.1. Research Scenario

According to the methodological process, it has been necessary to focus efforts on applying didactic strategies to adult students in rural areas of eastern Ecuador. For this purpose, the modality of directed surveys has become the best way to obtain information to guide decision-making.

The lack of knowledge of the methodological strategies and didactic resources of andragogy for the learning of rural youth and adults due to the low internet connectivity and the definition of the strategic curriculum for the teaching of BEYA has caused the low academic level of Language and Literature of the third baccalaureate of the educational extension Abdón Calderón.

Students from marginal, border, and difficult-access rural areas are welcomed in educational extensions that are located in strategic locations near these target groups where the Ministry of Education has not met the demand of the population that struggles between poverty and exclusion in all areas with various situations of the vulnerability of preliminary studies as education in this area is given by their rights.

The student community requires internet access, a device to connect to virtual classes, and, in the absence of connectivity, then it is strategically supplied by the teacher in the territory, who still needs to learn the learning situation of adults since the Ministry of Education does not establish any curricular design. Therefore, there are no professional profiles to facilitate this strategic andragogic model, and the application of the methodology is inadequate and lacks innovation by not including ICT.

Doing homework in class and sending reflection tasks home is an excellent method in rural adult education to access a future worthy of intellectual transformation, strengthen family values, society, and economy, and contribute to problem-solving to improve cultural identity. Therefore, to facilitate specific and personalized learning, technological strategies and tools are required to provide the student with information; hence, synchronous and asynchronous classes and the absence of inverted class practices.

Students can appropriate new technological tools and materials, such as tutorials, videos, recordings, printed support material according to the topic, intrinsic learning objects, screenshots, data from the home library, concept maps, timelines, videos, textual documents, presentations, podcasts, diagrams, among others, that give indications and guidance.

With these technological tools, project teachers provide support by developing alternative didactic material within the scope of their knowledge.

Adult learners learn permanently and attend voluntarily, characterized by their intrinsic motivation to understand; they also know according to their needs and problems; they are nurtured by collaborative learning, and their life experiences contribute to understanding, and pedagogy is the art and science of helping adults to learn.

Learning develops in environments with a collaborative relationship with their educators; consequently, the actors in the educational system become more productive when their contributions are recognized.

Therefore, adult learning is fostered and strengthened by approaching each one of them, showing interest in their education through respect and integrity as a person establishing friendship and trust with the learner, a fundamental factor to converting theoretical understanding into practical knowledge through attunement, relating it to work and professional environments that connect with real life.

Adult education is permanently based on the practice of the principles of horizontality and is oriented in a synergetic way. It enhances thinking, self-management, quality of life, and creativity, providing opportunities for self-fulfillment.

The andragogic process stimulates reasoning, promotes debate, argumentative discussion, and construction of ideas, favors communication, dialogue, and agreements, respecting the points of view that lead to rethinking the proposals after the confrontation of knowledge and individual action that conclude in resolutions of the learning group.

Taken into account that the student of the third high school of the Juan Jiménez Educational Unit, Abdón Calderón extension, Lago Agrio canton, province of Sucumbíos, Amazon region, in the semi-presential modality aimed at the education of young adults from rural and marginal urban areas, who study from Friday to Sunday, on a zoom platform, with personalized attention, flexible schedules, and work in the territory. A total of 39 students were enrolled, 100% participated in the surveys from the diversity of vulnerable areas, and 51 teachers established the parameters to make visible and achieve the same objective.

3.2. Research Instrument

The methodological process used to carry out the study is explained below. In this case, it is quantitative research because it is based on a survey according to the life system of the students and teachers who are part of the course.

The methodology, the materials, actors, and sources they can use to pass the school course and access the next higher system with the optimal exit profile satisfies their perspectives and encourages learning to study at home and go back to the beginning where education is born; at home in the coexistence with their parents.

The survey of 51 teachers will be analyzed, with 30 female and 21 male participants in a BEYA educational institution. The Likert scale is used, where we will explore the results of the methodology of andragogy, the flipped learning model, inverted classroom, and blended learning to apply to the innovation and evolution of andragogy for education and rural development, considering the learning objects.

Based on the results of the survey, the maximum statistics are used to identify the mechanisms that allow for innovative education during the BEYA process, considering the technological limitations and, in this way, synthesize the considerations highlighted by teachers and students about the teaching-learning process of adults in rural areas and with low access to the internet.

Summary Tables 2–7 show the application of the instrument to the teachers.

Summary Tables 2–4 show the application of the instrument to students and parents; therefore, Table 5 shows the responses obtained in the actor's satisfaction surveys, the results of which are shown below on a Likert scale.

Table 2. Perception analysis instrument applied to teachers.

Summary-I	**L1**	**L2**	**L3**	**L4**	**L5**
General Data—Digitalization and Technology Culture					
1. The internet bandwidth in Mbps in your home is? 2. The internet in your home is shared with how many members? 3. The device to review audiovisual material related to your classes is? 4. Age? 5. Gender?					
Andragogy—Teaching Adult Learning					
6. Do you agree that teachers who educate young people and adults should have an andragogic profile to innovate the appropriate methodology and generate significant results?	22	24	3	1	1
7. Do you consider that the pedagogical cards planned for students in the regular system are suitable for youth and adult education?	6	21	2	16	3
8. Do you agree that the institution's teachers apply the same methodology as the regular face-to-face system to BEYA education?	1	12	8	23	4
9. Should teachers be familiar with andragogic pedagogy to plan classes according to the interests of the BEYA?	20	21	4	0	1
10. Do you agree that as a tutor, guide, or moderator of learning in youth and adults, it is necessary to know the reality of the adult and determine the appropriate standards for the achievement of expected results?	22	22	2	0	1
11. Do you agree that andragogy is a principle and an educational model to educate with a clear, unique, and coherent dimension for (BEYA) learning?	14	26	3	1	1

Table 2. *Cont.*

Summary-I	**L1**	**L2**	**L3**	**L4**	**L5**
Andragogy					
12. Do you consider it essential to determine that the adult individual is responsible for his training, his own merits, his self-control, and self-motivation for the solution of problems in his environment?	24	24	0	2	0
13. Do you consider important evolutionary, innovative learning as a strategy that leads the student to the educational activities guided and moderated through tutorials where young people and adults' interest in appropriate their required learning prevails?	15	28	3	0	0
14. Do you consider it essential that the education of young people and adults is a mediation of the tutor to facilitate interaction and feedback to autonomously build the specific knowledge of the need and reality of the environment?	17	25	3	0	0
15. Is it important that in education, the adult person is helped to develop in a personalized way, taking into account their learning difficulties and considering their learning as the center of attention and valuation?	17	22	4	1	0
16. Do you think applying andragogy as science in BEYA training is important? Learning is centered on life, personal self-direction, and when they experience needs.	14	29	3	0	0
17. Is it important to apply the andragogic methodology to improve the quality of life, participation, and personal commitment by implementing rural development projects adapted to innovative processes in community curriculum planning?	17	22	3	1	1

Table 3. Perception analysis instrument applied to teachers.

Summary-II	**L1**	**L2**	**L3**	**L4**	**L5**
Learning: Flipped Learning + Blended Learning					
18. How often do you research the evolution of the academic field to learn about and apply learning processes strictly for adults?	11	28	9	2	0
19. How often do you interact in learning environments using didactic resources in combination with ICT to achieve meaningful results and innovative education?	6	33	6	1	0
20. How often does the teacher apply the constructivist model in the classroom, through collaborative work, and do the classroom tasks take place outside school as an activity before the BEYA?	4	30	10	1	0
21. How often do you perform feedback and higher cognitive effort classes in the classroom to guide your learning doubts through feedback motivating you to knowledge?	6	28	8	2	2
22. How often do you apply for autonomous work in the classroom and send home assignments to learn on your own and with your resources?	6	29	6	3	0
23. How often do you incorporate pedagogical instruments for the student to manipulate and appropriately use interactive digital tools and meet the goals and objectives determined in the BEYA?	3	24	14	3	0
24. How often do you develop mentoring as a mediator and your participation in providing the confidence to build the culture through self-direction and self-management to change negative situations into opportunities?	7	32	6	0	0
Andragogy and Social-Rural Development					
25. Is planning meaningful learning strategies for adults likely based on problem-based learning and considering andragogy and pedagogy as complementary sciences for meaningful outcomes?	17	22	7	1	1
26. How likely is it to motivate your students to interact, socialize, debate with respect and accept limitations and mistakes to learn new knowledge, or update the knowledge they already have, that is, to learn to unlearn and learn to learn?	11	29	5	0	0
27. What is the likelihood of empowering identities: ethical, supportive, collaborative, inclusive of disabilities and groups in hybrid, formal and informal practices as approaches to community engagement with student diversity?	10	24	10	0	0
28. What degree of probability exists to generate self-knowledge in family and social relationships about health, gender relations, inequality, racism, and inequality, to articulate knowledge and daily difficulties allowing learning from other contexts?	12	22	10	0	0
29. Are educators likely to act with prudence and moderation in participating in democratic spaces open to dialogue and exchanging experiences in which they can speak and listen with autonomy and without prejudice or value judgments?	14	22	7	0	0
30. Is the BEYA methodology likely to value the skills, flexibility, creativity, and adapt to individual or group needs to classify social integration competencies?	12	28	5	0	0
31. What is the likelihood of student-led learning to achieve greater personal, organizational and social integration with the tutorial guidance of the teacher?	13	24	6	1	0

Table 4. Perception analysis instrument applied to teachers.

Summary-III	**L1**	**L2**	**L3**	**L4**	**L5**
Evolution and learning innovation of BEYA					
32. Do you agree that teachers should implement ICT as a strategy for better learning in youth and adult education?	27	20	0	0	0
33. Do you agree that BEYA training should be oriented, programmed, organized, and expanded in their cognitive, attitudinal, and procedural competencies to complement their personal and professional development?	18	25	1	0	0
34. Do you agree that the BEYA population should be included in education as a fundamental actor for social development, considering the defense of their rights and fulfilling their duties?	15	29	1	0	0
35. Do you agree that young people and adults who have dropped out of school and are now entering education should adopt a curricular model appropriate to their social stratum and the environment in which they live?	14	25	3	1	0
36. Do you agree that teachers who work with young people and adults should apply updated strategies, methods, and techniques that facilitate lifelong learning, leaving behind the blackboard, the chalk, the sheet of paper, and the long teaching hours?	21	19	2	3	0
37. Do you agree with the development of learning objects that can be coupled to the platform of virtual learning environments such as Moodle, since the adult person needs to be useful and continue their preparation to achieve personal achievements?	17	23	2	0	1
38. Do you agree that policies should be implemented with well-suited programs to strengthen digital literacy and virtualize classrooms for synchronous and asynchronous learning to facilitate a solvent education to personal, institutional, and social challenges in BEYA?	12	30	2	0	0
Comprehensive, inclusive education					
39. Do you consider that it is essential to strengthen adult education in rural community settings as an educational and encouraging work, maintaining cultural identity and the roots of the homeland and is defined as a factor of development and localization?	28	17	1	0	1
40. Is it important for professionals working with BEYA to know the specificities, difficulties, and changes inherent to aging to design strategies to achieve the objectives and goals adapted to their own experiences?	22	20	2	0	1
41. Do you consider important and necessary the evolution of the andragogic process to promote integration strategies to improve the commitment and participation of rural communities in the implementation of development projects in search of a better quality of life?	18	21	5	0	0
42. Do you consider it important to banish the traditional conception that there is an age limit for learning? Furthermore, the educational institutions do not apply the postulates of andragogy; they handle criteria of autocracy and the discrepancy between theory and practice to apply the same processes in the education of the BEYA.	19	17	2	0	1
43. Is it important that to improve the quality of education at BEYA, teachers with an andragogical profile will have permanent training in flexible access to apply this educational model that represents an alternative for human development?	19	22	2	0	1
44. Is it important to educate young people and adults who respond to their interests, needs, and experiences based on their rationality of the changing and difficult course of life?	18	25	2	0	0

Table 5. Perception analysis instrument applied to students and parents.

Summary-IV	**L1**	**L2**	**L3**	**L4**	**L5**
General Data - General Data - Digitization and Technology Culture 1. Is there enough internet connection where you live for all the people studying? 2. The internet in your home is shared with how many members? 3. The device you use to review audiovisual material related to your classes is? 4. Age? 5. Gender?					
New learning methods					
6. Do you agree that the teachers who teach subjects in your institution have a professional profile to apply the appropriate methodology to facilitate learning accurately?	20	13	3	2	1
7. Do you agree that pedagogical projects sent by the Ministry are adapted to the reality of the educational system of our institution?	11	14	3	0	0
8. Do you agree that teachers use the same method of education presence in Inconclusive education because they are not updated to educate the students of our fiscomisional semi-presential educational institution?	8	12	5	2	2
9. Do you agree that your teachers work on topics of interest to your students through collaborative work on solving everyday problems?	7	16	3	1	0
10. Do you agree that innovative classes should be tutorials that guide analysis, and synthesis, through concept maps, schemes, summaries, and project elaboration?	8	15	1	3	1
11. Do you agree that your teachers apply a clear, unique, and consistent methodology in virtual and face-to-face tutorials?	16	10	0	0	2

Table 5. *Cont.*

Summary-IV	**L1**	**L2**	**L3**	**L4**	**L5**
Inclusive education as a human right					
12. Do you consider unfinished education important because it allows us to study and work and thus schedule our schedule and get ahead with our goals and objectives?	27	10	1	1	0
13. Do you think it is essential that the tutor facilitates interaction between students to discuss and learn, as well as receive reinforcement through feedback, personalized and group reinforcement?	10	16	3	1	0
14. Is it important for teachers in the 21st century to be experts in educating with modern technologies and methodologies, including each person's advanced degree of learning?	10	12	6	1	0
15. Do you consider necessary the time you have to study at home doing your weekly homework, besides working and having a personalized education to clarify doubts and strengthen your knowledge?	14	13	1	1	0
16. Do you consider it important for your teachers to know the pedagogy of our educational system and to be able to solve homework assignments at home through a study schedule and include research projects in your free time?	14	11	3	0	0
17. Do you consider inclusive education for all people with special needs important and should be prioritized in educational institutions?	16	9	3	1	0
18. Do you consider it important that all people have access to free quality and warm education and find a future of a dignified and more humane life?	18	6	2	0	0

Table 6. Perception analysis instrument applied to students and parents.

Summary-V	**L1**	**L2**	**L3**	**L4**	**L5**
Social and cultural learning					
19. How often do your teachers make you passionate about technology when taking virtual platforms classes?	14	12	7	2	2
20. How often do teachers adopt the pedagogical projects of the Ministry of Education to the reality of the social environment?	6	13	7	1	0
21. How often is priority attention to students with different abilities considered to guide them in educational inclusion projects?	5	15	7	0	0
22. How often do your teachers present motivational classes that encourage you to set goals, objectives, and improvement purposes to create, generate and execute development projects in your community?	11	13	3	0	0
23. Is it common to learn new things and unlearn things that are no longer useful in life while taking classes? Do you continue to evolve in innovation?	5	16	6	0	0
24. Is there a likelihood of improved classroom learning when teachers use innovative technological tools to facilitate learning?	11	9	4	2	1
25. How often in the pandemic era did your parents become teachers, understanding that they are the first educators and, in that scenario, the family is the first social organization?	13	4	4	4	2
Classroom interaction					
26. Is there a likelihood of effective use of the technological tools that the teacher uses in class and YouTube learning to reinforce knowledge?	17	9	6	2	1
27. Is there a likelihood of using collaborative work in the classroom and learning the most meaningful content as a team?	8	12	4	1	0
28. What is the probability of learning when I am sent assignments to work on at home and then present in class and receive input from classmates to strengthen my knowledge of something new?	7	14	5	0	0
29. Is it likely to use technological tools appropriate to the subject of study in virtual and face-to-face classes?	9	14	3	0	0
30. Is it likely that classes are better understood when the teacher uses appropriate technological tools and more knowledge is obtained?	14	9	2	1	0
31. What is the likelihood of valuing the cultural and social aspects, such as customs and traditions, by promoting ancestral knowledge of our community cultures?	7	12	5	0	0
Education as a social challenge					
32. Do you agree that the quality of education has improved during the pandemic because people study at home with the support of the family, teacher, and Ministry, making the educational trilogy a reality?	17	11	2	3	1
33. Do you agree that the learning experience acquired in informal education is a favorable factor in the classroom studying in this new social reality?	11	7	6	1	0
34. Do you agree that innovative education is challenging to pursue quality and warm higher education by developing critical thinking?	7	15	3	0	0
35. Do you agree that, in virtual classes, students should do research and collaborative work to achieve practical learning?	11	10	2	2	0
36. Do you agree that teachers in your educational institution should be more investigative and updated in technologies to promote authentic learning in students?	11	13	0	1	0
37. Do you agree that a master class from a teacher is the best methodology to achieve practical learning for life and competencies in this new normal?	11	13	1	0	0

Table 7. Perception analysis instrument applied to students and parents.

Summary-VI	L1	L2	L3	L4	L5
Improving education for life					
38. Is it important for the teacher to implement in the classrooms the new technological tools suitable to facilitate learning in our institution?	25	9	0	0	0
39. Is it important for teachers to be permanently involved in the training process for educational innovation?	10	11	2	1	0
40. Do you think it is essential for your educational institution to implement innovative ongoing training policies for students and teachers?	11	11	1	1	0
41. Is it important that teachers in your educational institution are trained in human relations and ethical and moral values and transmit their knowledge with great motivation, creativity, confidence, and support in collaborative work?	12	10	2	1	0
42. Is it important that your English and math teachers are in permanent training and improve pedagogy and collaborative work strategies for better learning?	14	10	0	0	0
43. Is it important that the educational institution where you study implements English language learning from early education as a priority for further university studies?	12	11	0	1	0
44. Is it important for all people to have access to education without age limits, to study and become professionals, to improve their living conditions, and to move forward with their life projects?	17	5	2	0	0

4. Analysis of Results

As a data collection tool, a pre-designed questionnaire was used through the Google Forms platform, completed online and anonymously during August of this year, to observe the most impressive ranges in learning performance.

Satisfaction surveys conducted on teachers and students are analyzed. The following table systematizes the highest percentages obtained for the research objective.

Next, it is fundamental to know the internet connectivity of both teachers and students; from the Figure 3, it is crucial to mention that for internet access, according to teachers, 50% use a bandwidth lower than 20 Mbps for the development of virtual classes, while 2% use a bandwidth higher than 100 Mbps.

Among students, it is essential to mention that, according to students, 13% use a bandwidth lower than 20 Mbps for virtual classes, while 4% use a bandwidth higher than 100 Mbps.

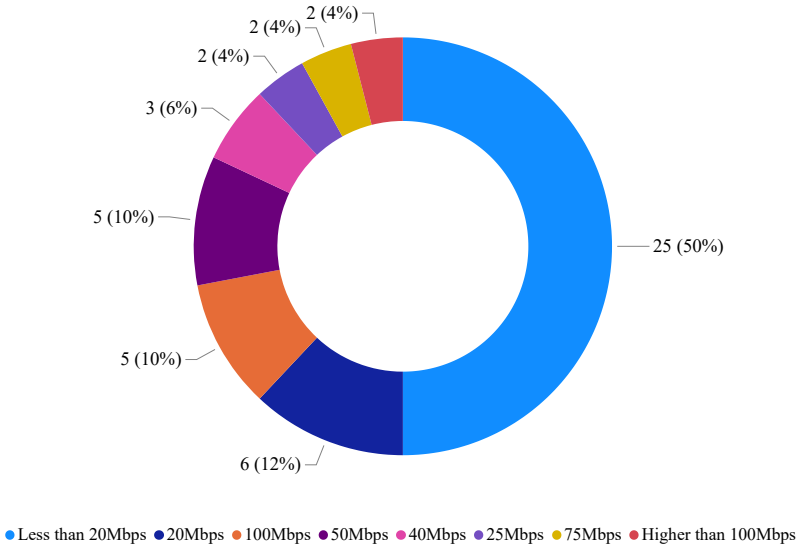
Figure 4a represents the student's opinion about the internet bandwidth and connectivity reach in the rural sector to develop virtual classes. The students expressed that for the bandwidth of fewer than 20 Mbps, 7.69% said that two people share the internet, 15.38% is shared with three people, 7.69% said that the internet is shared with four people, 7.69% noted that the internet is shared with five people. 53.85% commented that the internet is shared with more than five people, and 7.69% expressed that only one person uses the internet, which means low fluency and stability, even more when it is shared among several people.

Secondly, of students who expressed a bandwidth of 20 Mbps, 20% said that the internet is shared with four people, 40% noted that the internet is shared with more than five people, and 40% expressed that only one person uses the internet. In comparison, about the bandwidth of 100 Mbps, 25% said that the internet is shared with five people, 50% expressed that the internet is shared with more than five people, and 25% expressed that only one person uses the internet. These results clearly show the ineffectiveness of the participants in having a clear signal.

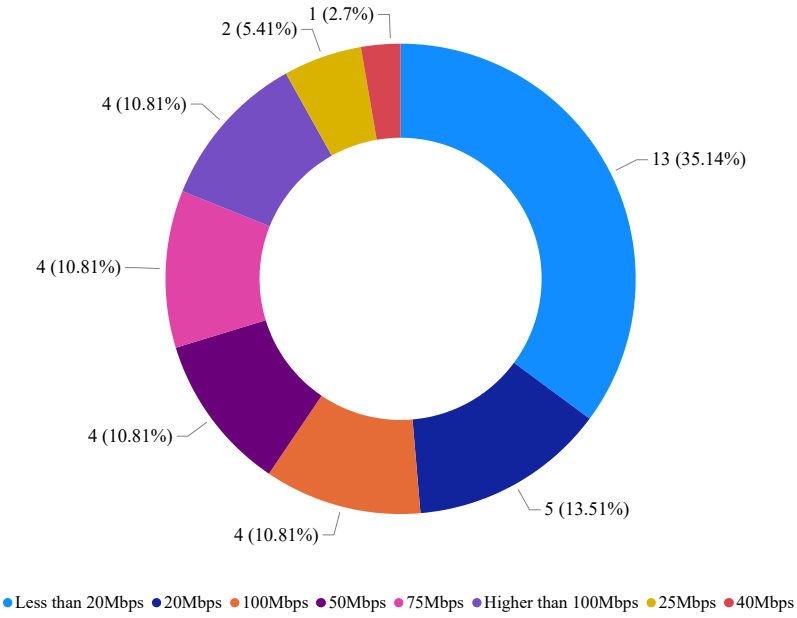
Of the participants who stated a bandwidth of 50 Mbps, 25% said that the internet is shared with four people and 75% noted that the internet is shared with more than five people, while for a bandwidth of 75 Mbps, 25% said that the internet is shared with five people, and 75% noted that the internet is shared with more than five people. With a bandwidth above 100 Mbps, 50% of the students express that internet is shared with two people, and 50% express that internet is shared with more than five people. Additionally,

the bandwidth between 25 and 40 Mbps, 100%, expresses that the internet is shared with more than five people.

Figure 4b shows that among students in the age range between 15 and 20 years old in the rural sector, 73.33% consider it very important to work and study, and 26.67% consider it essential to do both activities. In comparison, for students between 21 and 25 years old, 66.67% state that unfinished education is vital, 22.22% express it as necessary, while 11.11% consider it moderately important, and students between 31 and 35 years old and 46 and 50 consider it very important to study and work because it allows them to program their schedule and get ahead with their proposed goals. In contrast, students between 36 and 40 consider unfinished education of minor importance, while students between 41 and 45 years old and 56 and 60 years old consider it essential. In conclusion, there is an evident tendency in the 15 to 20 age range regarding BEYA education, which allows them to choose their study schedule, develop in the labor field, and learn on their own merits.

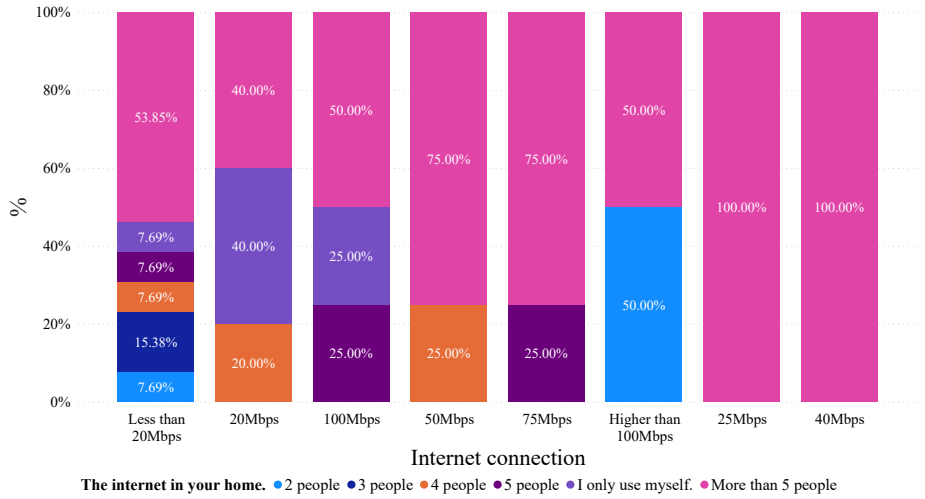


(**a**) Internet access, according to Teachers

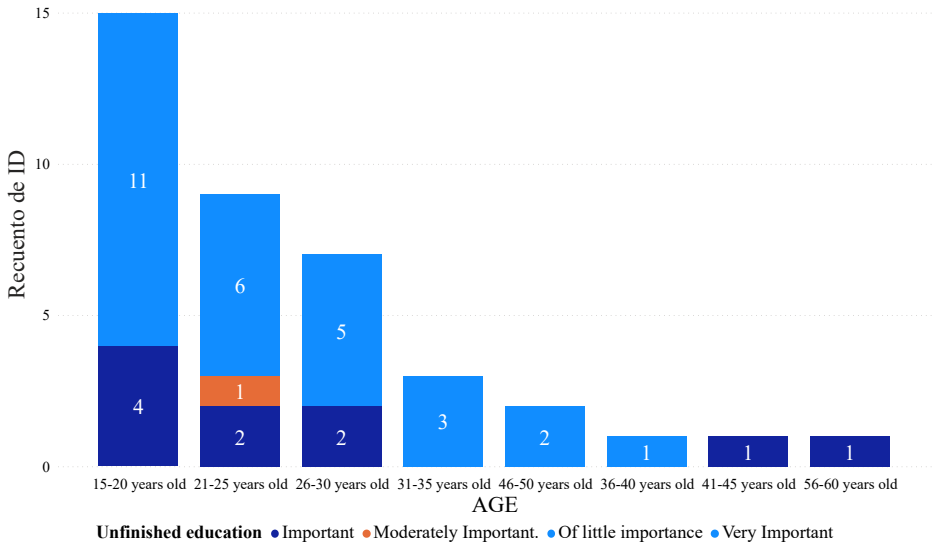


(**b**) Internet Access according to Students

Figure 3. Remote connectivity—(**a**) Educators. (**b**) Students. Source: Authors.



(**a**) Internet connection



(**b**) Unfinished Education

Figure 4. Degree of connectivity and unfinished education.—(**a**) Bandwidth. (**b**) Unfinished Education. Source: Authors.

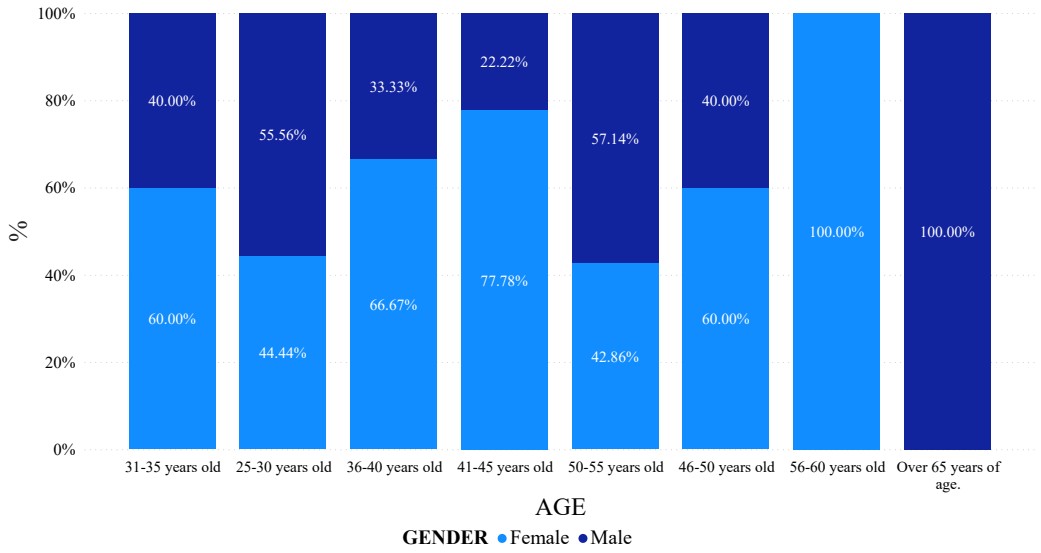
In Figure 5a the population consisted of 51 teachers. In the age group between 31 and 35 years old, 60% (6 people) were female and 40% (4 people) were male; in second place, between 25 and 30 years old, 55.56% (5 people) were female and 44.44% (4 people) were male; in third place, between 36 and 40 years old, 33.33% (3 people) were female and 66.67% (6 people) were male; between 41 and 45 years old, 22. 22% (2 persons) correspond to the female gender and 77.78% (7 persons) to the male gender; between 50 and 55 years, 57.14% (4 persons) correspond to the female gender and 42.86% (3 persons) to the male gender; between 46 and 50 years, 40% (2 persons) correspond to the female gender and 60% (3 persons) to the male gender; between 56 and 60, years 100% (1 person) correspond to the female gender; and over 65 years, 100% (1 person) correspond to the male gender.

From Figure 5b, 20% of teachers between 31 and 35 years old agree that ICT should be implemented as a strategy for better learning in youth and adult education, while 80% agree that both groups consider a favorable trend for the effective use of technologies as learning mediators.

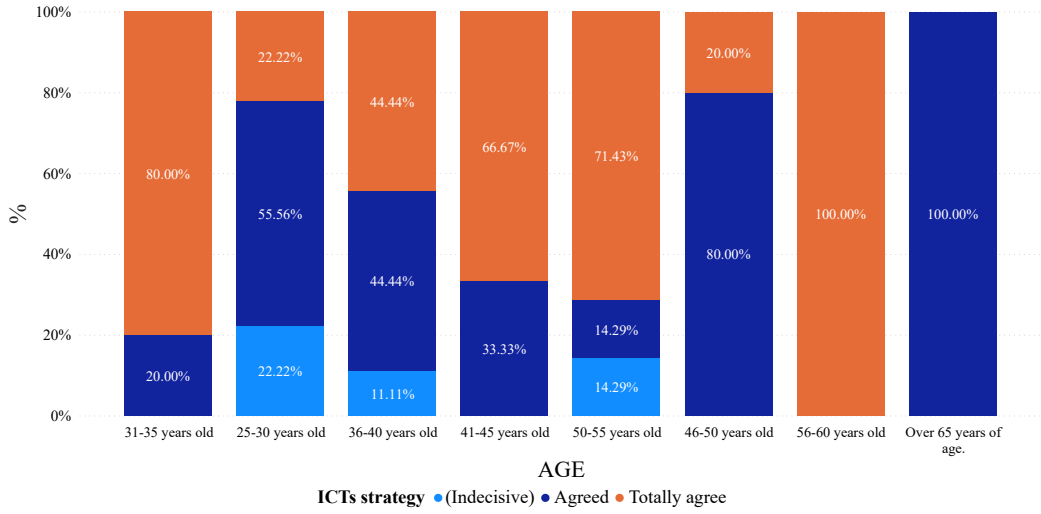
A total of 33.33% of teachers between 41 and 45 agree that ICTs are implemented to improve learning in education for young people and adults, while 66.67% agree. It is observed with greater precision that information technologies should be appropriate to BEYA's personal and meaningful learning.

Eighty percent of teachers between 46 and 50 agree that ICTs are implemented to improve learning in education for young people and adults, while 20 percent strongly agree. This group tends to reaffirm the strategic and specific use of ICT. It is focused on the importance of the participants in an active way.

All teachers between 56 and 60 agree that ICT is implemented to improve learning in the education of young people and adults.



(**a**) Age and Gender of Teachers



(**b**) ICT for Education

Figure 5. Age range and gender of teachers and learning strategies. (**a**) Age and Gender of Teachers. (**b**) Learning Strategies. Source: Authors.

5. Discussion

The andragogical processes evaluated from theoretical approaches need to be experienced in environments and contexts since they allow us to show the restrictions of the domain. Such a situation occurs in rural areas with limited access to the internet for teachers and students. Additionally, the motivation for adults to continue their studies is linked to the professional and entrepreneurial activities they maintain in rural areas for their family development. Therefore, a problem-based learning approach becomes an opportunity for the teacher to motivate a change in the classroom environments of adults who have returned to academia.

Educational innovation becomes a fundamental pillar for scenarios with vulnerable areas, with social, economic, and connectivity restrictions; future research visualizes the opportunity to characterize the problems of these areas and bring them to the classroom. The inverted classroom with a focus on project-based learning allows the inclusion of material pre-established by the teachers who will previously review the problems that concern the environment. In this way, the interest and motivation to return to the academy have a double meaning related to increasing knowledge and learning for the environment's praxis.

Concerning the teachers' internet bandwidth, 25 respondents, equivalent to 50%, responded that they have a bandwidth of fewer than 20 Mbps, and 4%, i.e., two participants, stated that they have internet of 20Mbps the other participants are at an intermediate level. Hence, the results indicate the low quality of internet connectivity, a determining factor in virtual learning.

According to the 51 teachers surveyed, they need to learn the statistics of students who do not have access to the internet and electronic devices to develop educational activities. On the other hand, the lack of knowledge of the socio-economic reality means the internet causes inconveniences for research and virtual classes since the teacher, the student-related activities of the educational environment, and interaction are developed in courses between students, in debates, and collaborative and personalized work.

In this new normality, teachers are immersed in the virtual and digital world because of the need to be trained in the world of ICT for classes with students, but the connection system does not favor it because a minimum percentage of students are connected; most of them do not relate to educational days. Likewise, teachers who live in different rural areas have volatile connection problems, i.e., the internet connection in the region is inefficient, especially in marginal rural areas.

The firm answers about a teacher's suitability to use technologies in learning, including essential tools such as videos, tutorials, audio, and recorded classes, for those who can take advantage of synchronous and asynchronous learning, in addition to the knowledge and definition of an andragogic pedagogy suitable for BEYA, brings the excellent experience of informal learning experienced in different realities. It includes special needs and educational inclusion, which is recognized as a right to receive a free education of quality and warmth.

6. Conclusions

The present work has contrasted options of new models of education and andragogical innovation for students in rural areas with a low internet connection through virtual didactic tools, with specific strategies to implement mechanisms and synthesize outstanding aspects of the educational actors of a quality education led by a curriculum established by the Ministry of Education for equal rights considering the person as the center of learning for a dignified life.

The results and experiences of the inverted classroom model with andragogical strategies and didactic learning resources have been considered in different countries to establish its evolution and innovation with the progressive implementation of ICT. It is, moreover, respecting the student's learning pace in all areas of life.

Andragogy is a science that studies the learning of adults who already have experiential knowledge and require an understanding of self-management and development to take it to the praxis of life.

Adults have particular interests, and education should be designed to enhance their family, work, social, political, and political responsibility in all areas of life, so it is essential to create strategic resources through learning objects for the participant to develop their knowledge in specific spaces and also to develop their research skills.

BEYA is a planetary human tendency with a diversity of groups focused on continuing their andragogic studies in the whole exercise of the inverted classroom, blended learning, determining instruments and tools that facilitate learning according to their interests, and designing learning objects, breaking traditional paradigms, and implementing the use of synergy, which generates alternatives of what, how, and for what to study. The educational institution lacks an andragogic model with a profile of teachers who continue with traditional educational models and should implement training to design planning for this adult system so that students have professional academic options with a vision of the future.

It is important to note that the previous works reviewed in this document incorporate a valuable theoretical guide; however, the praxis in rural areas requires an educational innovation capable of meeting the demands, such as those stated in the objective of this work related to motivating and improving the learning of adults according to the needs of the context in which they develop.

On the other hand, there are coincidences in the strategies based on ICT applied to education about the fact that many applications are limited in use when there is no adequate internet connectivity; in this sense, it is necessary to apply ICT that does not require online work. Thus, the strategy of motivation and future improvement for adult learning is divided into two parts; the first part is dedicated to the training of teachers in new technologies, including the creation of podcasts and the application of learning management systems with previously developed material for the proper application of flipped learning as a mechanism for self-learning and advancement of subjects. A second stage is dedicated to adult learners with material and training for self-learning, highlighting, as an added value, the solution of problems through specific projects.

As a consequence of what has been exposed in this document, it is necessary to incorporate policies from the government to maintain a continuous increase in internet connectivity or to generate info-centers that host the society that requires directed or autonomous learning from the use of the internet.

Author Contributions: A.R. conceptualized the study, analyzed the data, and wrote the initial draft; E.I. analyzed the data and revised the draft; A.R. provided critical feedback and edited the manuscript; E.I. provided Zoom support and critical feedback. All authors have read and agreed to the published version of the manuscript.

Funding: This work was supported by Universidad Politécnica Salesiana and GIREI, Smart Grid Research Group, under the project Flipped Learning and Blended Learning. Funding was also provided by the Smart Grid & Smart Cities Research Group, RECI-IUS.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Informed consent is obtained from all subjects involved in the study.

Data Availability Statement: Not applicable.

Acknowledgments: This work was financially funded by the Smart Grid Research Group (GIREI) of Universidad Politécnica Salesiana (Project: ICT for Education) and the Power Grids and Smart Cities (RECI-IUS).

Conflicts of Interest: The authors declare no conflict of interest.

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