PRÁTICAS EDUCATIVAS, MEMÓRIAS E ORALIDADES

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Challenges and strategies in mathematics education for young people and adults (EJA): a systematic literature review

ARTICLE

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Abstract
This article analyzes academic production on mathematics education in Youth and Adult Education (EJA) through a systematic review (Sampaio; Mancini, 2007). The databases used were SciELO, SciVerse Scopus and LILACS. The results point to three essential aspects: reading and writing barriers that make it difficult to solve mathematical problems (Smole; Diniz, 2001); the insertion of innovative pedagogical practices to improve mathematics teaching in EJA; and valuing students' experiences and cultures for more inclusive learning (D'Ambrosio, 1990; Fonseca, 2020). We conclude that, despite advances, it is essential to understand the students' context, give voice to their experiences and avoid the infantilization of mathematical teaching.
Keywords: Mathematics Education. Youth and Adult Education. Problem Situations. Experiences.

Desafios e estratégias na educação matemática para jovens e adultos (EJA): uma revisão sistemática da literatura

Resumo
Este artigo analisa a produção acadêmica sobre a educação Matemática na Educação de Jovens e Adultos (EJA) por meio de uma revisão sistemática (Sampaio; Mancini, 2007). As bases de dados utilizadas foram *SciELO, SciVerse Scopus* e LILACS. Os resultados apontam três aspectos essenciais: as barreiras de leitura e escrita que dificultam a resolução de problemas matemáticos (Smole; Diniz, 2001); a inserção de práticas pedagógicas inovadoras para melhorar o ensino da Matemática na EJA; e a valorização das vivências e culturas dos alunos para uma aprendizagem mais inclusiva (D'Ambrosio, 1990; Fonseca, 2020). Concluímos que, apesar dos avanços, é fundamental compreender o contexto dos alunos, dar voz às suas experiências e evitar a infantilização do ensino matemático.
Palavras-chave: Educação Matemática. Educação de Jovens e Adultos. Situações-problema. Vivências.

1 Introduction

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Youth and Adult Education (EJA - Educação de Jovens e Adultos) plays a fundamental role in promoting equal opportunities and combating illiteracy, as well as enabling and emphasizing concepts for basic Mathematics learning. It is a type of Basic Education, recognized in LDBEN (Lei de Diretrizes e Bases da Educação Nacional) no. 9.394/1996, which in Article 37 states: “Youth and adult education shall be intended for those who did not have access to or continuity of studies in Primary and Secondary Education at the appropriate age.” This means that enrollment in Primary Education is only possible from the age of 15 (fifteen) and in Secondary Education, at the age of 18 (eighteen).

These individuals are workers, elderly people, youth, and teenagers who are unemployed and understand that returning to school is a path that may lead to achieving a stable financial life. However, school dropout is seen as a social issue that is part of the reality of many Brazilians who do not attend school because they are forced to work from an early age to help support their families financially. (Teixeira, 1999). For them, there are no rights and even less a sense of hope for the future. They dream of attending school, want a better future, and aim to “be someone in life,” but at times, there is a complete lack of motivation.

Attending a school setting, for many, holds no meaning at all. And this lack of motivation worsens when unpleasant and monotonous moments are experienced within the school itself, where enthusiasm and joy are not part of the learning process. As a result, being at school every day becomes just another obligation, a rule to be followed.

Since the 1988 Federal Constitution, access to education has been guaranteed to the population equally, but in practice, this is not very evident—especially when it comes to Youth and Adult Education (EJA). This is reinforced by the National Education Plan (PNE - Plano Nacional de Educação), whose goals emphasize the importance of expanding enrollment in this modality, fostering professional education.

Data from the School Census of 2022 indicates that Youth and Adult Education (EJA) has been experiencing a decrease in enrollments in this type of education, and in that particular year, the decline was even more pronounced—6.3% compared to the

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previous year. During this period, 188 thousand fewer students were in the classroom or were enrolled in other types of education. The numbers show a decrease in both the Primary Education and Secondary Education stages.

EJA students often attribute their academic struggles to their age, which is quite contradictory, since they possess a wealth of life experience with a variety of activities developed in social contexts. When considering learning skills across curricular components, students' difficulties become more apparent when it comes to the area of Mathematics.

Many students begin or return to their studies in EJA with limited knowledge of Mathematics, especially in areas such as basic operations, geometry, algebra, and problem-solving. This learning gap is often linked to factors such as lack of motivation, gaps in prior knowledge, low self-confidence, or even inadequate teaching methods, all of which contribute to the difficulty in progress and may even lead to educational exclusion in Mathematical Education.

Studies indicate that, for these students to succeed, Youth and Adult Education (EJA) must be integrated with Professional Education so that both work in harmony. Students enrolled in this educational modality bring with them a wealth of unsystematized knowledge, and their return to the classroom allows them to gain qualifications and opportunities, and even learn to use technological resources.

Given this context, it is essential that public policy discussions focus on this demographic—in other words, developing methods that encourage student retention. Several scholars have dedicated themselves to studying the factors that contribute to student dropout. Among the issues discussed, one of them may be the absence of a dynamic, creative, and engaging methodology. The content is often demotivating, presented in a decontextualized way and without meaning for the student.

This deficit could be mitigated using Digital Information and Communication Technologies (TDIC - Tecnologias Digitais da Informação e Comunicação) in the school environment, which have proven to be powerful tools for teachers in the classroom. When used strategically, these technologies have the potential to spark student interest through

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innovative practices, making the teaching and learning process more dynamic, accessible, and meaningful.

2 Methodology

A systematic literature review was used, which is a method that allows searching, analyzing, and identifying all similar research for a specific research question. It is characterized, therefore, by employing a research methodology with scientific rigor and high transparency, aimed at minimizing literature bias, as it involves exhaustive collection of published texts on the topic in question (Thorpe *et al*., 2005; Tranfield; Denyer; Smart, 2003).

This approach aligns with authors who describe it as a comprehensive and systematic search across various bibliographic databases, with the goal of identifying all relevant studies related to the research question (Sampaio; Mancini, 2007).

For this Systematic Literature Review (Revisão Sistemática de Literatura - RSL), a protocol was developed with the following steps: formulation of the research question, bibliographic search, study selection, data extraction, quality assessment, and synthesis of results. Through each step, the issues presented by the authors are identified, and from there, the gaps found are shown.

The systematic review begins with a question, which, in this case, was: How is Mathematics Education being addressed in Youth and Adult Education?

2.1 Definition of keywords and inclusion and exclusion criteria

The following keywords were defined: "Educação Matemática" (Mathematics Education) and "EJA" (Youth and Adult Education), which returned works related to the theme. The choice of this focus was driven by professional experience and the concern about how the characteristics of adult students and their specific needs for learning Mathematics are addressed.

Inclusion and exclusion criteria were established with the aim of ensuring that the collected data is relevant and suitable to answer the research. It is worth noting that no time frame was used in the selection of the articles. Box 1 presents the inclusion and exclusion criteria.

Box 1 – Summary of inclusion and exclusion criteria used for the selection of texts related to the Systematic Literature Review (RSL)

Inclusion Criteria	Exclusion criteria
They are related to Mathematics Education in Youth and Adult Education (EJA). Topics related to the learning of EJA students.	– They are related to Mathematics Education at other educational levels. – Works that address teacher training. – Duplicate articles. – Articles in other languages. – Articles about experiences with students with disabilities in EJA. – Articles that address systematic mapping or state of the art. – Articles about the curricular approaches of EJA.

Source: Prepared by the author (2024).

2.2 Search and databases consulted

The indexers SciELO, Scopus, and LILACS were selected, given the relevance of the studies available in these databases for the field of education. Data collection was conducted between February and March 2024.

From these search strings, all the articles found were saved in a spreadsheet, accounting for the number of articles found in each indexer, which facilitated data filtering and subsequent analysis.

After applying the inclusion and exclusion criteria, it was possible to observe and categorize the 51 articles into common characteristics, among which some did not have a direct focus on the research objective, and their results are presented in Table 1 below.

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Table 1 – Results of the search for works related to the Systematic Literature Review (RSL) in the research indexers.

Indexers	Included Articles	Duplicate Articles	Non-Duplicate Articles	Excluded After Title and Abstract Reading	Excluded After Full Reading	Included for Final Analysis
SciELO	5	0	5	0	3	2
Scopus	68	24	46	16	12	18
Lilacs	1	1	0	0	0	0
Total	**74**	**25**	**51**	**16**	**15**	**20**

Source: Prepared by the author (2024).

Thus, after the analysis and applying the exclusion criteria for duplicate articles, after reading the title and abstract, and full reading, 20 articles were selected.

2.3 Selection and identification of relevant academic works

In this section, we will present the results based on the analysis of the collected material. Three categories were constructed after analyzing the material, thus facilitating the analysis and discussion. In this way, combining the categories can integrate or bring together different educational approaches. Based on this assumption, they were classified as follows: problem-based learning, financial education, and active learning, as shown in Box 2.

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Box 1 – Categories of texts obtained in the Systematic Literature Review (RSL) after analysis.

Category	Articles	Description
Problem-Based Learning	14	In this category, there are articles that discuss problems with EJA students in a way that promotes critical thinking and the practical application of mathematical concepts.
Financial Education	2	In this category, there are articles that present financial concepts from various perspectives.
Active Learning	4	In this category, there are articles that present Mathematics Education to EJA students as the center of the learning process, involving them in practical activities such as games, simulations, experiments, and digital resources.

Source: Prepared by the author (2024).

2.3.1 Problem-Based Learning

This category includes 14 articles that discuss problem-solving with adult education (EJA) students, aiming to promote critical thinking and the practical application of mathematical concepts (Andrade & Fantinato, 2020; Doneze, Pereira & Dalto, 2019; Gomes & Caldeira, 2014; Lima & Borba, 2019; Lima & Galvão, 2020; Lima & Selva, 2013, 2020; Lopes Júnior, 2019; Miranda & Fonseca, 2017; Pavanello, Lopes & Araújo, 2011; Queiroz & Lins, 2011; Silva & Nacarato, 2011; Souza & Fonseca, 2018; Vizolli, 2008).

Lima and Selva (2013) analyzed 30 EJA students at different educational levels as they solved activities involving the construction and interpretation of graphs. The results showed no significant differences in graph interpretation based on educational background; however, several difficulties were observed in graph construction. Most graphs lacked essential elements such as titles, axis labels, and variable descriptions, which hindered overall understanding. The authors concluded that successful interpretation did not necessarily ensure the ability to construct adequate graphs.

Miranda and Fonseca (2017) investigated how youth and adult students in basic education understand and reflect on the possibilities and limitations of implementing an integrated curriculum in Mathematics classes at a Federal Institute over two academic

semesters. Their methodology included class recordings, collection of student written work, and analysis of institutional and adult education documents. They concluded that the proposed practices remain far removed from real-world work contexts. This gap is particularly concerning given that the study focused on a technical course integrated with high school education in the EJA modality—where integration with the world of work should be a foundational principle.

Vizolli (2008) shares experiences as a student, teacher, and researcher in Mathematics Education, focusing on mathematics as experienced in the daily life of a farming family, during EJA schooling, and in regular education. The findings emphasize the importance of valuing and respecting knowledge produced in cultural contexts, and of incorporating such knowledge into the teaching and learning process.

Doneze, Pereira, and Dalto (2019) explored the mathematical knowledge revealed by students during an activity based on the Written Production Analysis method, as proposed by Cardoso and Dalto (2017). The study, conducted with 20 seventh-grade students from a public school in the Metropolitan Region of Londrina (Paraná, Brazil), involved analyzing written productions from EJA students. These texts served as a basis for designing tasks. The findings revealed that students often considered only their own solutions as correct, overlooking the existence of multiple valid approaches to problem-solving. This led to a shift in how students attributed meaning to different mathematical solutions.

Lima and Borba (2019) investigated the contributions that exploring combinatorial problems can offer to probabilistic reasoning, and vice versa, focusing on the relationships established between knowledge related to Combinatorics and Probability. Data was collected through clinical interviews with 24 EJA students, during which interrelated combinatorial and probabilistic problems were presented. Student performance was influenced by the participants' educational levels, the types of problems proposed, and the order in which they were presented. The authors observed connections between knowledge of Combinatorics and Probability, leading them to argue that an integrated approach can benefit the development of such reasoning in EJA.

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Lima and Selva (2020) analyzed the performance of EJA students in elementary education from the municipality of Jaboatão dos Guararapes, PE, in activities involving the construction of bar graphs from tables. The study involved 88 EJA students enrolled in Modules III and V, corresponding to the final year of early elementary education and the final years of elementary education, respectively—44 students from Module III and 44 from Module V. Participants were invited to complete two tasks requiring them to construct bar graphs based on tabular data.

From these tasks, it became evident that more consistent and systematic classroom work is needed, focusing on the fundamental aspects of developing graphical representations, especially regarding the inclusion of essential elements for clear communication of information and the appropriate choice of scale.

They argue that this is essential for improving students' understanding and competence in handling graphical data, which plays a critical role in developing mathematical literacy.

> It is important that young people and adults develop skills to represent statistical information and to communicate their reactions to such data, becoming capable of understanding a given topic based on statistically processed data sets; thinking critically about the results; expressing opinions; making inferences; making decisions; and becoming familiar with official statistical information, as this is a key aspect for the development of statistical literacy and for life in society. (Lima; Selva, 2020).

Queiroz and Lins (2011) investigated the mathematical knowledge acquired by a group of adolescents enrolled in the Youth and Adult Education (EJA) program at a public state school in Recife, Pernambuco. The study aimed to identify the main difficulties that hindered the students' academic progress and impaired their access to the job market. Data collection involved a group activity consisting of a worksheet with ten additive arithmetic problems, administered to nine students from the 4th phase of the EJA program. The authors concluded that although the students did not have difficulty with addition, they showed a lack of understanding of the subtraction algorithm, especially when the operation required regrouping.

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Silva and Nacarato (2011) analyzed how a dialogical classroom environment enables the (re)signification of the mathematical knowledge of EJA students, contributing to critical mathematics education. The research was conducted with students from the 2nd and 3rd years of the EJA high school program in the public school system of the State of São Paulo, in 2006, in the city of Arujá, part of the São Paulo metropolitan area. Data collection included: 1) initial or exploratory interviews through questionnaires, interspersed with discussions on the importance of mathematics and education in people's lives; 2) video recordings of initial classroom activities and final interviews; 3) audio recordings of small group and/or whole-class discussions; 4) group productions and written records by students; 5) final interviews with the established groups; and 6) the researcher-teacher's journal and field notes. The authors concluded that the adopted methodology proved effective in promoting a new classroom culture for mathematics as well as in the resignification of school mathematics by the students.

Souza and Fonseca (2018) proposed the incorporation of the categories of gender and territory into reflections on the mathematical practices developed by students in the Youth and Adult Education (EJA) program. The study was conducted through the observation of mathematics classes and interviews with recyclable material collectors, aged between 18 and 69, participating in an EJA project linked to an association. During the study, the authors identified that both women and men navigate multiple identity territories: women appeared as students, caregivers, workers, mothers, grandmothers, and agents of advocacy; men appeared as students, workers, providers—generally less involved in caregiving—supportive among themselves, yet silent in the face of inequalities in labor relations. Considering this scenario, the authors emphasized that schools cannot ignore the symbolic, economic, and political marks of these territories, as they contribute to the silencing of other possible mathematical practices in the school environment, thereby deepening gender inequalities.

Lopes Júnior (2019) proposed teaching fractions in Youth and Adult Education (EJA) by systematically working with mathematical concepts through problem-solving as a methodology. For the activity, the author randomly selected four students from the second

segment of EJA, drawn from two classrooms of 45 students each from each class. When planning mathematics lessons and activities that reflected the lived reality of the students, the author aimed to create an environment in which they felt encouraged and willing to learn. According to him, recognizing students' values, practices, and knowledge not only contributes to identifying them but also to problematizing them. The author noted that during the execution and development of the activities, some students found it difficult to express their knowledge, especially due to the insecurity caused by social interaction and group dynamic elements that are not always easy for everyone.

Pavanello, Lopes, and Araujo (2011) analyzed the reading comprehension of students in elementary education—both in regular schooling and in the EJA system—regarding mathematics word problems and the understanding required to solve them. They collected data through interviews with twenty students from regular elementary school (ten from 5th grade and ten from 8th grade) and ten EJA students (five completing Phase I and five completing Phase II of elementary education). Their research was based on the Bakhtinian notion of speech genres and on scholars focusing on cognitive aspects of reading and text interpretation, such as Solé (1998) and Kleiman (2004); on communication and language in mathematics education, such as Gómez-Granell (1998); and on problem-solving, such as Bacquet (2001) and Medeiros (2001). At the end of the study, they found that participants demonstrated weaknesses in reading comprehension from both linguistic and mathematical perspectives. They also showed little familiarity with the discursive genre of "mathematical problem statements," lacked a precise understanding of what it means to solve a problem, and had difficulty retaining and properly managing essential information from the statements.

Gomes and Caldeira (2014) examined the possibility of working with Mathematical Modeling alongside incarcerated students in the Prison System of Paraná, Brazil, in the city of Curitiba and its metropolitan area. They conducted qualitative research within an action-research framework. The research involved six incarcerated students enrolled at the Dr. Mário Faraco State Center for Basic Education for Youth and Adults (CEEBJA), an EJA institution operating within all penal units in Curitiba and the metropolitan area, serving

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https://revistas.uece.br/index.php/revpemo
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incarcerated students in terms of formal education for the Paraná Penitentiary Department. According to them, the use of Mathematical Modeling allowed students to gather data and information, formulate, solve, and decide on issues of interest, as well as promoted the development of creativity, critical thinking, self-esteem, intuition, and curiosity—key elements in the process of reintegration into society. Therefore, the data from this study revealed that it is possible, under certain conditions, to work with Mathematical Modeling with incarcerated students.

Lima and Galvão (2020) analyzed the contribution of a Problem-Solving Worksheet to the development of skills aimed at solving problem situations. The worksheet was designed to guide students through the stages of Entry, Attack, and Review, according to the model proposed by Mason, Burton, and Stacey. They worked on multiplicative problems with 5th-grade students, problems involving functions with 9th-grade students in EJA, and problems involving linear equations with 2nd-year high school students. By applying this methodology, using the stages and group discussions facilitated by the approach, they stated that this activity was crucial for students to take ownership of their own problem-solving methods, discussing each proposed solution and, as a result, gaining a better understanding of the mathematical concepts involved.

Andrade and Fantinato (2020) discussed how the learning processes in Mathematics are experienced in high school within the NOVA EJA Program. The qualitative research, grounded in theoretical studies in Education and Mathematics Education, broadened the perspective on the discourses found in official documents and educational policies aimed at young and adult learners. According to the authors, the diversity of EJA students — marked by distinct learning trajectories, different ways of viewing the world, and constructing their own life stories — should guide critical pedagogical practices capable of embracing this plurality. This applies to both students and teachers, who have been trained in both past and recent times, in a constant intersection between the old and the new.

2.3.2 Financial Education

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In this category, two articles present financial concepts from various perspectives (Chagas; Santos, 2023; Chiappetta; Silva, 2021).

Chagas and Santos (2023) analyzed the interaction and autonomy gained by EJA students during a Financial Education course offered through the social media platform Facebook. The study presented discussions on financial education topics that can contribute to the social inclusion of EJA students in their daily lives. The authors offered a Financial Education course via Facebook, organized into five units, including two in-person sessions: an opening class and a final class, both held at a public school in Guarulhos/SP. Eight EJA students, all over 18 years old and attending between the 1st and 3rd years of high school, participated in the course. The study showed that students gained autonomy and awareness regarding their financial lives, highlighting the need for better decision-making in financial matters.

Chiappetta and Silva (2021) focused on the introduction of elements of Financial Mathematics and Financial Education for EJA students. This study revealed that the errors made in relation to the proper grouping of items related to Earnings and Expenses were almost completely eliminated. The authors also observed that the input from some students suggested that the use of familiar practices fosters connections between the knowledge they learned outside of school and the knowledge acquired in the classroom.

2.3.3 Active Learning

This category includes four articles that present Mathematics education for EJA students as the center of the learning process, involving them in practical activities such as games, simulations, experiments, and digital resources (Araújo; Silva, 2020; Freitas; Xavier, 2019; Santana *et al*., 2020; Schneider; Fonseca, 2014).

Schneider and Fonseca (2014) examined intricate games of intentionalities and tensions that are forged in, and which forge, the numeracy practices in the Education of Young and Adult People; in particular, they focused on games that mobilize labor practices

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of adult students in Basic Education, positioned alternately as workers who study or as students who work. The empirical material was produced through the observation of Mathematics classes for two groups in the second segment of the Fundamental Education in the EJA modality at a public school, over three semesters. The authors conclude that there are (in)capacities among young and adult subjects with little schooling to deal with abstractions or symbolic games organized based solely on syntactic rules, and that the discursive practices led by students and teachers in the classroom will not be immune to the resonances of these echoes.

Santana *et al*. (2020) analyzed the contributions of a teaching sequence, developed with situations using manipulable materials, to the learning of cube and square concepts in EJA. The teaching sequence was applied in a class of 25 students in the third educational stage, axis VII of EJA, at a public high school in Brazil. The authors noticed that after the explanations of the concepts, students still took time to identify the edges of the cube. This identification only occurred when it was emphasized that they should focus on the cube by concentrating on the elements that structure its shape, thus abstracting from its color, texture, density, etc.

Araújo and Silva (2020) analyzed the formation of geometric concepts in EJA, mediated by the GeoGebra software. They also proposed mathematical activities to be performed with the same software in two distinct EJA classes at a public school in Vitória da Conquista-BA, totaling six sessions with each class, one with 24 students and the other with 10. The choice of using GeoGebra software as the media artifact is believed to have allowed students to form mathematical concepts about plane geometry. The authors concluded their studies by proposing that Digital Technologies (TDs) need to be part of pedagogical practices, especially in Mathematics teaching.

Freitas and Xavier (2019) explored the influence of the Mathematical pedagogical practices of EJA teachers on student retention in a rural school in Ceará. The qualitative study followed a theoretical-methodological approach involving the observation of classes, teacher study sessions, and interviews with students and teachers. Among the results, it was found that many students already possessed mathematical knowledge acquired

through their childhood experiences, particularly in working with carnaúba palm fronds. In the classroom, these skills are mobilized in different ways by students who seek to relate them to school Mathematics. The research provided reflections on the meaning of the pedagogical practices of EJA teachers, the curricular practices in Mathematics within this modality, and especially on the factors that contribute to students' retention in EJA classes in rural Ceará.

3 Discussion

When discussing Mathematics Education for Young and Adult Learners (EJA), it is essential to understand that, for the most part, these students have not completed their schooling during childhood or adolescence and present various specificities. These students come from both urban and rural areas, with significantly different age ranges, varying expectations regarding school, and different levels of ease or difficulty with learning. Despite this, it is crucial that the teacher remains attentive to avoid infantilizing the teaching of Mathematics.

In this section, we will discuss the main themes that emerged from the analysis of the different categories. Analyzing the studies, we identified three key aspects of Mathematics Education in EJA, discussed in order to meet the diversity of this clientele with such peculiar characteristics:

1. Identification of barriers in reading and writing skills among EJA students that hinder the resolution of mathematical problems;

2. Incorporation of teaching resources and practices that contribute significantly to the teaching and learning process in EJA Mathematics classes;

3. Valuing the life experiences and cultures of EJA students in order to promote a more inclusive and meaningful Mathematics Education.

Out of the total articles analyzed, seven highlighted the need to identify the reading and writing difficulties of EJA students that hinder their ability to solve mathematical problems (Doneze, Pereira; Dalto, 2019; Lima; Borba, 2019; Lima; Galvão, 2020; Lopes

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Júnior, 2019; Miranda; Fonseca, 2017; Pavanello; Lopes; Araujo, 2011; Queiroz; Lins, 2011).

Academic research has focused on identifying the barriers related to reading and writing difficulties faced by EJA students, which impede the resolution of mathematical problems. Literature emphasizes the need to overcome a traditional approach to Mathematics, centered on memorization of concepts and mechanical application of formulas. Instead, it advocates for an active form of Mathematics that engages students' interests and experiences, enabling them to understand and solve real-life problems through a contextualized and meaningful process.

In EJA education, the process of reading and writing requires more in-depth attention, and the teacher's role goes beyond simply transmitting content. It is essential for the teacher to also act as a social educator, with a sensitive understanding of the students' life trajectories, recognizing that many of them may have gaps in their mathematical knowledge. This perspective broadens the purpose of teaching, valuing both welcoming and collaborative knowledge construction.

During classes, we observed students' difficulty in reading comprehension and even in interpreting simple phrases. When we propose problems to the students, they face many challenges in solving them. If the task is to interpret a mathematical problem, the challenge is even greater. In various situations, even after completing the reading, students struggle to identify the relevant information and interpret what is being asked correctly, which compromises their ability to solve the problem and often prevents them from completing the task.

Indeed, the difficulties in interpreting problem statements for problem-solving are an inherent challenge in teaching Mathematics. Smole and Diniz (2001, p. 72) already pointed out "the difficulty that students encounter in reading and understanding texts is, among other things, linked to the absence of specific pedagogical work with problem texts" in Mathematics classes. In this regard, the importance of everyday language is emphasized in order to establish a connection with real life.

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Fonseca (2020) highlights the urgent need to contextualize mathematical knowledge to be transmitted or constructed. This contextualization goes beyond the mere insertion of content into a problem-situation: it involves searching for its origin and its relationship with everyday experiences. Such an approach prevents knowledge from becoming abstract and meaningless, while also facilitating comprehension and increasing students' motivation to solve the proposed problems.

In this sense, identifying these barriers is crucial for rethinking the teaching of Mathematics. We agree with Jerônimo (2007) in stating that problem-solving practices become one of the best strategies for teaching Mathematics both inside and outside the classroom, bringing interpretation of social, environmental issues, as well as solving various daily challenges. This is emphasized by Fonseca (2020) when stating that the main objective of Mathematics education in EJA is to contribute to the development of students' reading and writing skills. In other words, this contribution cannot solely rest in the "hands" of the Portuguese Language teacher, but must involve collaborative work with all educators.

This gap is evident in the literature, as all the studies developed did not include the participation of other areas of knowledge. Bortone (2012) emphasizes that interdisciplinary work ensures that students have a better understanding of natural and social phenomena, promotes discussion, and stimulates dialogue. She adds that interdisciplinarity fosters innovation, creativity, and problem-solving by allowing the combination of different perspectives and specialized knowledge.

This is why productions that address these aspects demonstrate how the difficulty of interpretation causes one of the main barriers in teaching Mathematics. We need to study and create strategies that enable the development of mathematical knowledge.

Thus, in addition to the strategy presented above, other strategies to overcome the barriers of interpreting problem statements include the incorporation of new teaching resources and practices for a significant contribution to the teaching and learning process in Mathematics classes in EJA.

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https://revistas.uece.br/index.php/revpemo
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A second aspect from the survey points to the need for incorporating new teaching resources and practices to significantly contribute to the teaching and learning process in EJA Mathematics classes. Among these discussions, we had contributions from Andrade and Fantinato (2020); Araújo and Silva (2020); Gomes and Caldeira (2014); Lima and Selva (2013); Silva and Nacarato (2011); Souza and Fonseca (2018); Vizolli (2008). These studies discussed classroom practices, such as, for example, the construction of graphs, manipulable materials, and the use of new technologies.

During classes, we still observe very traditional teaching practices. Students simply receive information from the teacher passively. In EJA, this frequency is even more pronounced. This student often comes from a tiring workday and, upon arriving at school, encounters classes that can sometimes be discouraging.

This makes the teacher more concerned with developing these practices, which should be planned to meet these needs. Above all, the development of collaborative practices, interdisciplinary approaches, and the incorporation of digital information and communication technologies can be a strong ally for the teacher in the educational context of EJA.

Just as the identification of barriers in reading and writing facilitates mathematical problem-solving, the insertion of new pedagogical practices could contribute to the success of Mathematics education in EJA. However, we cannot forget the ongoing professional development of teachers, which often happens in an improvised manner. For example, the criteria for becoming a teacher in EJA are the same as those for teachers in other educational modalities. Moura (2009), discussing the improvisation of teaching in EJA, warns that, in most cases, teachers use strategies from their own schooling process to determine their methodology in EJA classrooms, lacking specific theoretical-methodological references for the field.

Fonseca (2020) draws teachers' attention to the importance of recognizing the Mathematics that students already know and use in their daily lives, even if it does not appear in the traditional school format. Indeed, teaching and learning Mathematics in EJA face numerous challenges, including the diversity of student profiles, the use of age as a

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https://revistas.uece.br/index.php/revpemo
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justification for supposed cognitive limitations, as well as students' frequent demotivation and insecurity regarding the subject. These difficulties are often related to previous negative school experiences and significant gaps in learning, which can lead to school dropouts. Additionally, barriers related to literacy and digital exclusion also directly impact on the mathematical learning process in this context.

The EJA teacher needs to be challenged to move beyond traditional teaching. Morán (2013) points out digital technologies as allies for more participatory and integrated learning, facilitating research, communication, and networking. They should be flexible, contextualized, inclusive, and student-centered, promoting students' autonomy, confidence, and interest in Mathematics through innovative and meaningful pedagogical approaches.

In the third aspect, the articles by Andrade and Fantinato (2020); Chagas and Santos (2023); Chiappetta and Silva (2021); Gomes and Caldeira (2014); Souza and Fonseca (2018); and Vizolli (2008) highlight the importance of valuing the life experiences and cultures of EJA students to promote a more inclusive and meaningful Mathematical education.

The student in this modality presents a wealth of experiences and a diversity of cultures, mainly due to differences in age and the day-to-day situations experienced by everyone. These are young and adult individuals who have an active participation in the context of their communities, often developing work in agriculture, associations, and even in cultural relations.

Therefore, to address these students' skills, the role of the EJA teacher must be as strategic as possible, especially in their pedagogical practice. Capucho (2012) affirms that this teacher needs to reflect on the diversity of contexts in which the pedagogical practice takes place and the plurality of these individuals.

Regarding Mathematics, this teacher should take full advantage of the students' prior knowledge before presenting/systematizing the content. Additionally, it is suggested to rely on the ideas of Freire (2000), incorporating social issues into the lessons so that students can act both locally and globally. In this sense, this valuing of "common sense"

Rev. Pemo, Fortaleza, v. 7, e14472, 2025
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https://revistas.uece.br/index.php/revpemo
ISSN: 2675-519X

knowledge needs to be understood, as, in most cases, students are workers who deal with daily mathematical concepts in various situations, such as measurements, spreadsheets, problem-solving, handling money, and financial situations.

This reflection leads to the discussion of Ethnomathematics, a research field that has been consolidated in Brazil and worldwide since the 1970s, with the Brazilian researcher Ubiratan D'Ambrosio (1990) being the main proponent. According to the author, Ethnomathematics is based on the hypothesis that the relationship of the subject or community with the Mathematics they practice, or use defines both its form and its object. It is, therefore, about recognizing and valuing the mathematical knowledge produced in various cultural contexts, often invisible in traditional school Mathematics.

It is within this context that the EJA teacher, as Fonseca (2020) points out, needs to take into consideration that students do not come to school solely for the acquisition of tools, but for immediate use in their daily lives through reading practices.

Still discussing the importance of valuing the EJA student's life experiences, their life stories need to be contemplated, as they serve as methodological tools in the teaching and learning process. We need to understand this student not only in the classroom setting but also to value their stories of overcoming challenges and the expectations that led them to return to school. Knowing the student means understanding the context in which they are inserted, paying careful attention to the dynamics established in the classroom (Fonseca, 2020).

This systematic literature review sought, during the research phase, to analyze the challenges and strategies in Mathematical education for young adults, identifying a total of 20 articles. These studies led us to discuss three categories: problem-solving-based learning, financial education, and active learning.

The experiences found in this academic production are effective in identifying that EJA students still have gaps in reading, writing, comprehension, and interpretation skills of problem statements in Mathematics. Sometimes, they master algorithmic procedures but fail to complete the solution due to not understanding the question, while others do not perform the numerical calculation.

Rev. Pemo, Fortaleza, v. 7, e14472, 2025
DOI: https://doi.org/10.47149/pemo.v7.e14472
https://revistas.uece.br/index.php/revpemo
ISSN: 2675-519X

We observe that almost all the research on these themes analyzes the difficulties of EJA students but does not present teaching strategies to reduce the comprehension of problem statements in Mathematics and their resolutions.

We need to understand the context in which the student is inserted, give them a voice, listen to them, embrace and leverage all non-systematized knowledge, and, moreover, not infantilize Mathematical education.

4 Final considerations

This systematic literature review sought, during the research phase, to analyze the challenges and strategies in Mathematics education for Young Adults (EJA), identifying a total of 20 articles. These studies led us to discuss three categories: problem-solving-based learning, financial education, and active learning.

Based on the categories, the production points to three elements: 1. Identification of barriers related to reading and writing skills of EJA students that hinder the resolution of mathematical problems; 2. Insertion of teaching resources and practices to significantly contribute to the teaching and learning process in Mathematics lessons in EJA; 3. Valuing the life experiences and cultures of EJA students in order to promote a more inclusive and meaningful Mathematical education.

These experiences found in academic production are effective in identifying that EJA students still present gaps in reading, writing, comprehension, and interpretation skills when it comes to problem statements in Mathematics. Sometimes, they master algorithmic procedures but fail to complete the solution due to not understanding the question, while others do not perform the numerical calculation.

We observed that almost all the research on these themes analyzes the difficulties of EJA students but does not present teaching strategies to reduce the reading comprehension of mathematical problem statements and their solutions.

We suggest the incorporation of new teaching practices in Mathematics lessons for EJA, such as the use of educational technologies, didactic sequences, and practical

activities, if they are adapted to individual needs and characteristics. In this way, these strategies promote motivation to participate in lessons, greater understanding of mathematical concepts, and increased autonomy through collaborative work.

Understanding and respecting the value of EJA students' experiences is the key point for them to remain in school, as Mathematics is often considered the villainous subject that drives students to drop out. We need to understand the context in which the student is inserted, give them a voice, listen to them, embrace and leverage all non-systematized knowledge, and, moreover, avoid infantilizing Mathematical education.

References

ANDRADE, Eliane Lopes Werneck; FANTINATO, Maria Cecilia Castello Branco. A aprendizagem de Matemática por alunos adolescentes na modalidade educação de jovens e adultos. Rio Claro: **Bolema**, v. 24, n. 38, 1 abr. 2011.

ANDRADE, E. L. W.; FANTINATO, M. C. C. B. Concepções de Matemática que forjam o ensino médio programa nova EJA. **Revista Exitus**, Santarém, v. 7, n. 3, p.88-114, set./dez. 2017.

ARAÚJO, T. O. R.; SILVA, M. D. F. Das motivações ao referencial teórico: os caminhos para consolidar uma pesquisa sobre educação de jovens e adultos e o usodas tecnologias digitais. **Revista de Matemática, Ensino e Cultura**, [Belém, PA], ano 15, p. 61-78, jan./dez. 2020.

BACQUET, M. **Matemática sem dificuldades**: ou como evitar que seja odiada por seu aluno. Porto Alegre: Artmed, 2001.

BORTONE, M. E. Letramento e competência: construindo novos paradigmas na escola. **Entreletras**, Araguaína, v. 3, n. 2, p. 192-203, ago./dez. 2012.

BRASIL. **Lei nº 9.394, de 20 de dezembro de 1996**. Estabelece as diretrizes ebases da educação nacional. Brasília, DF: Presidência da República, [2024]. Disponível em: https://www.planalto.gov.br/ccivil_03/leis/l9394.htm. Acesso em: 22ago. 2024.

CAPUCHO, V. **Educação de jovens e adultos**: prática pedagógica e fortalecimentoda cidadania. São Paulo: Cortez, 2012.

Rev. Pemo, Fortaleza, v. 7, e14472, 2025
DOI: https://doi.org/10.47149/pemo.v7.e14472
https://revistas.uece.br/index.php/revpemo
ISSN: 2675-519X

CARDOSO, M. A. M.; DALTO, J. O. Mas esta questão já está resolvida!?: como os alunos do ensino fundamental analisam produções escritas em uma prova de Matemática. **Educação Matemática em Revista**, Brasília, DF, v. 22, n. 56, p. 162- 175, out./dez. 2017.

CHAGAS, M. A. N.; SANTOS, C. E. R. Interação e autonomia de alunos da educação de jovens e adultos no Facebook: contributos de um curso de educaçãofinanceira. **Jornal Internacional de Estudos em Educação Matemática**, [São Paulo], v. 16, n. 1, p. 104-114, 22 jun. 2023.

CHIAPPETTA, S. K. S.; SILVA, J. R. Planilha orçamentária em aula de Matemática: uma análise das respostas de discentes da EJA. **Revista de Educação Matemática e Tecnológica Iberoamericana**, [Recife], v. 12, n. 2, p. 1-17, 13 jul. 2021.

D'AMBROSIO, U. **Etnomatemática**: arte ou técnica de explicar e conhecer. SãoPaulo: Ática, 1990.

DONEZE, I. S.; PEREIRA, F. F.; DALTO, J. O. As primeiras impressões da análise da produção escrita como fio condutor de uma aula de Matemática. **Revista de Ensino, Educação e Ciências Humanas**, [Londrina], v. 10, n. 1, p. 21-27, 30 mar. 2019.

FANTINATO, Maria Cecilia; FREITAS, Adriano Vargas. Perspectiva decolonial da etnomatemática como movimento de resistência. **Revista de Educação Matemática**, [s. l.], v. 18, n. Edição Especial, p. e021036, 2021.

FONSECA, M. C. F. R. **Educação Matemática de Jovens e Adultos**: especificidades, desafios e contribuições. 3. ed. Belo Horizonte: Autêntica, 2020.

FREIRE, P. R. N. **Pedagogia da autonomia**: saberes necessários à práticaeducativa. 14. ed. São Paulo: Paz e Terra, 2000.

FREITAS, A. V.; XAVIER, F. J. R. Práticas pedagógicas em Matemática na EJA e a permanência de estudantes em uma escola da zona rural do Ceará. **Educação Matemática Pesquisa**, São Paulo, v. 21, n. 1, p. 238-253, 29 abr. 2019.

GÓMEZ-GRANELL, C. Rumo à epistemologia do conhecimento escolar: o caso da educação Matemática. *In*: RODRIGO, M. J.; ARNAY, J. (org.). **Domínio do conhecimento, prática educativa e formação de professores**: a construção do conhecimento escolar. São Paulo: Ática, 1998. v. 2, p. 15-41.

GOMES, M. J. T.; CALDEIRA, A. D. Modelagem no cárcere: educação Matemática para a paz. **Revista Eletrônica de Educação**, [São Carlos, SP], v. 8, n. 2, p. 44-57,20 ago. 2014.

JERÔNIMO, M. A. M. **Dificuldades dos alunos da EJA para interpretar e resolver situações-problema matemáticos**. 2007. Trabalho de Conclusão de Curso (Especialização em Educação Profissional Técnica de Nível Médio na modalidade de Jovens e Adultos) – Universidade Federal da Paraíba, Bananeiras, 2007.

KLEIMAN, A. **Texto e leitor**: aspectos cognitivos da leitura. 9. ed. Campinas: Pontes, 2004.

LIMA, E. T.; BORBA, R. E. S. R. Articulando os raciocínios combinatório e probabilístico a partir da resolução de problemas na EJAAr. **Educação Matemática Pesquisa**, São Paulo, v. 21, n. 1, p. 136-159, 29 abr. 2019.

LIMA, R. N.; GALVÃO, M. E. E. L. registro das etapas da resolução de problemas como recurso para um melhor desempenho de estudantes em vários níveis de escolaridade. **Revista de Educação Matemática**, São Paulo, v. 17, e020027, p. 1- 15, 1 jan. 2020.

LIMA, I. B.; SELVA, A. C. V. Jovens e adultos construindo e interpretando gráficos. **Bolema**, Rio Claro, SP, v. 27, n. 45, p. 233-253, abr. 2013.

LOPES JÚNIOR, J. E. Matemática, frações e EJA: diminuindo distâncias. **Revista de Matemática, Ensino e Cultura**, [Belém, PA], ano 14, n. 32, p. 148-162, 27 dez. 2019.

LOPES, S. E.; ARAUJO, N. S. R. Leitura e interpretação deenunciados de problemas escolares de Matemática por alunos do ensino fundamental regular e Educação de Jovens e Adultos (EJA). **Educar em Revista**, Curitiba, n. esp. 1, p. 125-140, 2011.

MEDEIROS, C. F. Modelos mentais e metáforas na resolução de problemas matemáticos verbais. **Ciência e Educação**, Bauru, v. 7, n. 2, p. 209-234, 2001.

MIRANDA, P. R.; FONSECA, M. C. F. R. Estudantes do PROEJA e o currículo de Matemática: tensões entre discursos numa proposta de integração. **Educação Matemática Pesquisa**, São Paulo, v. 19, n. 3, p. 131-156, 30 dez. 2017.

MORÁN, J. M. Ensino e aprendizagem inovadores com apoio de tecnologias. *In*: MORÁN, J. M.; MASETTO, M. T.; BEHRENS, M. A. **Novas tecnologias e mediação pedagógica**. 21. ed. Campinas: Papirus, 2013. p. 11-72.

MOURA, T. M. M. Formação de educadores de jovens e adultos: realidade, desafiose perspectivas atuais. **Práxis Educacional**, Vitória da Conquista, v. 5, n. 7, p. 45-72, jul./dez. 2009.

Rev. Pemo, Fortaleza, v. 7, e14472, 2025
DOI: https://doi.org/10.47149/pemo.v7.e14472
https://revistas.uece.br/index.php/revpemo
ISSN: 2675-519X

SAMPAIO, R. F.; MANCINI, M. C. Estudos de revisão sistemática: um guia para síntese criteriosa da evidência científica. **Revista Brasileira de Fisioterapia**, São Carlos, SP, v. 11, n. 1, p. 83-89, jan./fev. 2007.

SANTANA, E. *et al*. Materiais manipuláveis e conceitos geométricos: uma sequênciade ensino desenvolvida na Educação de Jovens e Adultos. **Revista de Educação Matemática**, São Paulo, v. 16, e020005, p. 1-15, 1 jan. 2020

SCHNEIDER, S. M.; FONSECA, M. C. F. R. Práticas laborais nas salas de aula de Matemática da EJA: perspectivas e tensões nas concepções de aprendizagem. **Bolema**, Rio Claro, SP, v. 28, n. 50, p. 1287-1302, dez. 2014.

SILVA, J. E. N.; NACARATO, A. M. (Re)significando a Matemática escolar por meio da resolução de problemas em sala de aula da EJA. **Educação Matemática Pesquisa**, São Paulo, v. 13, n. 1, p. 117-140, 4 abr. 2011.

SMOLE, K. S.; DINIZ, M. I. Ler e aprender Matemática. *In*: SMOLE, K. S.; DINIZ, M. I. (org.). **Ler escrever e resolver problemas**: habilidades básicas para aprender Matemática. Porto Alegre: Artmed, 2001. p. 69-86.

SOLÉ, I. **Estratégias de leitura**. Porto Alegre: Artmed, 1998.

SOUZA, M. C. R. F.; FONSECA, M. C. F. R. Cenas de uma aula de Matemática: território e relações de gênero na eja. **Pro-Posições**, v.29, n.3, p.138-163, set./dez. 2018.

TEIXEIRA, A. S. A escola brasileira e a estabilidade social. *In*: TEIXEIRA, A. S. **Educação no Brasil**. 3. ed. Rio de Janeiro: Editora UFRJ, 1999. p. 99-132.

THORPE, R. *et al.* Using knowledge within small and medium-sized firms: a systematic review of the evidence. **International Journal of Management Reviews**,New York, v. 7, n. 4, p. 257-281, Dec. 2005. .

TRANFIELD, D.; DENYER, D.; SMART, P. Towards a methodology for developing evidence-informed management knowledge by means of systematic review. **British Journal of Management**, [London], v. 14, n. 3, p. 207-222, Sept. 2003.

VIZOLLI, I. Rememorando aspectos de vivências Matemáticas. **Cadernos do Aplicação**, Porto Alegre, v. 21, n. 2, p. 357-377, jul./dez. 2008.

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