Journal Homepage: -www.journalijar.com

INTERNATIONAL JOURNAL OF ADVANCED RESEARCH (IJAR)

Article DOI:10.21474/IJAR01/22022
DOI URL: http://dx.doi.org/10.21474/IJAR01/22022

RESEARCH ARTICLE

EMPOWERING DIGITAL CITIZENSHIP IN ADULT EDUCATION: A PEDAGOGICAL APPROACH BASED ON BNCC'S EM13CO08 AND THE FILM THE CIRCLE

Marco Aurelio Schunke[1], Clarice Ramalho Townsend[2], Letícia Teresinha Dias[3], Tatiane Braga Dos Reis[4], Moises Gallas[3] and Marcia E. J. Kniphoff Da Cruz[5]

1. Programa de Pos-Graduacao em Informática na Educacao (UFRGS).
2. Universidade Federal de Santa Maria (UFSM).
3. Universidade Federal do Rio Grande do Sul (UFRGS).
4. Universidade do Vale dos Sinos (UNISINOS).
5. Universidade de Santa Cruz do Sul (UNISC).

Manuscript Info

Manuscript History
Received: 17 August 2025
Final Accepted: 19 September 2025
Published: October 2025

Key words:-
Digital Citizenship, Computing and Society, Adult Education, BNCC, Ethics and Privacy.

Abstract

This pedagogical practice illustrates how computing education, when contextualized through cinema and active learning strategies, can empower adult learners to navigate the digital world with critical awareness and ethical responsibility. Beyond technical proficiency, participants developed a deeper understanding of privacy, data protecti on, and the ethical dimensions of digital interaction in professional contexts.Grounded in the BNCC competency EM13CO08, the experience reaffirmed computing's dual role as both a tool and a transformative social force. It fostered learners' autonomy and their capacity to act ethically, collaboratively, and consciously within digital environmentscontributing to the development of critical digital citizenship in adult education.

Introduction:-

Imagine yourself as the protagonist of your own story in the world of work where technology and computing shape how you interact, collaborate, and make decisions. In today's digital society, understanding the EM13CO08 competency from Brazil's Base Nacional Comum Curricular de Computação (BNCC Computação) becomes essential. This competency encourages learners to perceive computing not merely as a tool for problem-solving, but as a catalyst for cultural, social, and economic transformation.Since its official inclusion in 2022, BNCC Computação has established structured guidelines for computing education in Basic Education across Brazil, emphasizing three core dimensions: Computational Thinking (CT), Digital World (DW), and Digital Culture (DC) (BRASIL, 2022). These pillars promote not only technical proficiency but also the capacity for critical and ethical engagement with technology.To explore EM13CO08 in a meaningful and interdisciplinary way, this pedagogical experience draws inspiration from the film The Circle (2017). The narrative portrays a powerful technology company that redefines the boundaries between transparency and surveillance. Through the protagonist Mae Holland's ethical dilemmas, students are invited to reflect critically on computing's influence in professional and

Corresponding Author:-Marco Aurelio Schunke
Address:-.Universidade Federal do Rio Grande do Sul (UFRGS).

social life.This activity immerses students particularly those from EJA (Educação de Jovens e Adultos) in discussions about technological ethics, workplace digitization, and privacy in a hyperconnected world. Through active analysis and simulation, they are encouraged to connect computing concepts with real-world contexts, developing agency as critical digital citizens.Ultimately, this learning experience aims to strengthen computational and critical thinking, preparing adult learners to navigate and transform the digital labor landscape with autonomy and ethical awareness.

Justification end Objectives:

General Objective:

To analyze an educational practice that mobilizes the BNCC EM13CO08 competency through critical engagement with computing and its role in the digital world of work.

Specific Objectives:

- Understand the possibilities and limitations of computing as a driver of social transformation.
- Discuss the ethical use of technology and data protection in digital environments.
- Foster agency and critical reflection among EJA students about their role in a digitized labor market.
- Apply computational thinking to real-world decision-making and problem-solving.
- Integrate cinema and computing education as an interdisciplinary and formative strategy.

Metodology:-

Participants and Context:

The intervention was conducted with 32 students enrolled in the Youth and Adult Education (EJA) program, aged between 18 and 45 years, all attending the final stage of high school at the Instituto Estadual de Educação Olavo Bilac, located in Rio Grande do Sul, Brazil. The participants represented a diverse group in terms of age, professional background, and prior digital literacy experiences, reflecting the heterogeneous nature of adult education settings in Brazil.The pedagogical activities were implemented over four sessions of approximately 90 minutes each, held during the first semester of 2023. Each session was designed to progressively integrate computational thinking, ethical reflection, and collaborative problem-solving. The sequence moved from conceptual exploration to practical simulation and critical analysis, combining both individual and group-based learning dynamics.Participation in the project was entirely voluntary. All procedures were carried out in accordance with the institution's ethical guidelines for educational research, ensuring informed consent, respect for participant confidentiality, and adherence to the ethical principles established by the Brazilian educational and research framework.

Pedagogical Design:

The Interactive Business Simulation (SEI) methodology was employed, selected for its strong potential to integrate computational reasoning, teamwork, and ethical reflection through practical simulations set in fictional business environments. This approach enabled learners to engage in decision-making processes, address technological and ethical challenges, and apply computational thinking principles in dynamic, problem-based contexts that mirror real-world professional situations.

Stages of Implementation:-

- Initial Preparation: Introduction to the BNCC EM13CO08 competency and discussion on "digital protagonism." Students were organized into teams representing fictional companies.
- Simulation Development: Each team faced a workplace scenario involving technology use. Using digital tools, teams applied computational reasoning to propose ethical solutions.
- Mentorship and Feedback: Teachers served as facilitators, providing formative feedback. Weekly reflection checkpoints enabled teams to reassess strategies and improve their proposals.
- Presentation and Film Integration: Teams presented solutions and connected them to ethical dilemmas from The Circle, fostering parallels between fiction and their simulated contexts.
- Individual Reflection: Each student completed a reflective essay articulating how computing competenciescritical thinking, decision-making, and digital ethicscould inform their professional development.

Data Collection and Analysis:-
A mixed-method research design was adopted, integrating both quantitative and qualitative approaches to obtain a comprehensive understanding of the learning outcomes and participant engagement.

- Quantitative dimension: Pre- and post-intervention tests were administered using a 10-item Likert scale to assess participants' levels of understanding in key domains, including computing ethics, data protection, and digital protagonism. The comparative analysis of these results allowed for the identification of measurable cognitive and attitudinal gains.
- Qualitative dimension: Data were collected through observation logs, focus-group discussions, and individual reflective writings. These materials were systematically analyzed using thematic coding, focusing on emergent categories such as ethical awareness, digital agency, and collaborative interaction. This qualitative analysis provided deeper insights into learners' experiences, perceptions, and the transformative aspects of the pedagogical intervention.

Materials and Resources in the Ethical and Digital Intervention for Adult and Youth Education (EJA):
To support the implementation of the Interactive Business Simulation (SEI) methodology and to foster ethical and digital reflection among EJA students, a diverse set of materials and technological resources were employed, combining traditional and digital tools to ensure engagement, accessibility, and meaningful learning.

Computers or mobile devices with internet access:
These were essential for carrying out digital activities, research tasks, and interactive simulations, as well as for utilizing online collaborative tools. The access to devices enabled students to experience real digital environments, fostering digital literacy and autonomy in technology-mediated learning.

Projector (data show) for film screening:
Used to present The Circle (2017), the projector served as a key instrument to engage students visually and emotionally. The collective film viewing provided a common reference point for subsequent discussions on digital ethics, privacy, and technological protagonism.

Film The Circle (2017):
A technothriller set in a powerful digital corporation, The Circle explores contemporary ethical dilemmas of the digital agesuch as surveillance, privacy, transparency, and social responsibility. The film portrays the gradual exposure of personal life in the name of security and innovation, providing a rich narrative context to stimulate critical debate and applied ethical reflection.

Printed and digital worksheets:
Used for planning, simulation development, and recording student reflections, these worksheets helped structure learning processes, organize ideas, and systematize both individual and group knowledge construction.

Online collaborative tools:
Platforms such as Google Workspace and Padlet facilitated synchronous and asynchronous interaction among participants. They supported teamwork, information sharing, and the co-construction of ethical and technological proposals, reinforcing a sense of digital community and collaborative authorship.

Assessment:-
The evaluation of learning outcomes in this intervention employed a triangulation of methods, ensuring greater robustness and validity of results. This approach combined quantitative and qualitative analyses to comprehensively assess cognitive, ethical, and behavioral development.

Pre-/Post-Test Comparison:
A clear improvement was observed in students' performance, with average scores rising from 6.2 to 8.4, representing an approximate 35% increase. This result indicates a significant advancement in students' understanding of digital ethics and their ability to apply these principles in decision-making contexts.

Reflective Essays:
Approximately 87% of students demonstrated an advanced ability to articulate ethical dilemmas and structure decision-making frameworks. These reflections revealed a deep internalization of key concepts discussed during the intervention, showing evidence of critical awareness and personal transformation.

Observation Rubrics:
Facilitators reported an increase in engagement, initiative, and leadership during group simulation activities. This reflects a strengthening of collaborative competencies and greater participation in collective problem-solving. The triangulation methodology employed here involved multiple data sources and analytical techniques to enhance the reliability and interpretative depth of the findings. Such a mixed-method approach is widely recommended in educational research (Creswell & Plano Clark, 2018) to validate results in complex learning processes, particularly those related to ethical reasoning and digital competence.Overall, the collected evidence demonstrates that the intervention consistently fostered the growth of participants' skills and knowledge, confirming the effectiveness of the integrated strategiesfilm analysis, simulations, reflective writing, and ethical debatesas supported by contemporary literature on educational assessment and digital pedagogy.

Limitations and Future Work:
The main limitations of the intervention stemmed from its implementation in a single educational institution, where restricted access to digital devices and intermittent internet connectivity affected the scalability of the project. These technological constraints limited both the frequency and inclusiveness of activities, potentially hindering the full participation of all students in the proposed learning experiences.For future research and practice, it is recommended that the intervention be replicated across multiple institutions to assess its applicability and adaptability in diverse EJA (Youth and Adult Education) contexts. A longitudinal follow-up is also advised to examine the transfer of acquired competenciessuch as ethical reasoning, digital agency, and computational thinking to real professional and digital environments. Additionally, comparative evaluations between different institutional contexts would allow the refinement of the SEI methodology and the adjustment of pedagogical strategies according to local needs and socio-educational realities.

The literature highlights similar challenges in technology-mediated educational interventions, particularly in socially vulnerable contexts, where issues of access, infrastructure, and socioeconomic inequality directly influence program implementation and learner engagement (Selwyn, 2016; Redecker, 2017). Incorporating these contextual variables into future studies will support the design of more robust, equitable, and context-sensitive educational frameworks for teaching digital ethics and computational competences.Recognizing these limitations is essential for the critical advancement of the field, as it fosters the development of educational actions that expand impact, enhance digital inclusion, and promote authentic digital protagonism among adult learners.

Logic Model Summary:
The Logic Model is a structured framework for the planning, implementation, and evaluation of educational programs. It is widely recognized for establishing a clear causal relationship among inputs, activities, outputs, and outcomes, thereby ensuring coherence between objectives, actions, and expected impacts (W. K. Kellogg Foundation, 2004; McCawley, 2012).In this study, the model was adapted to the context of Youth and Adult Education (EJA) to illustrate how ethical and digital literacy can be effectively integrated through active learning strategies aligned with the Computing component of Brazil's National Common Curricular Base (BNCC), specifically the EM13CO08 competency.The BNCC EM13CO08 competency guides learners toward understanding technological change and its implications for digital security, including the ability to protect personal data and privacy online, as well as to identify and report risk situations (BRASIL, 2022). This competency provides the pedagogical foundation for the intervention, which aims to develop learners' ethical engagement in digital environments, strengthening their digital agency, critical decision-making, and awareness of the social consequences of technological innovation.Thus, the application of the Logic Model in this context promotes a systematic alignment of pedagogical, technological, and ethical elements, providing a robust foundation for meaningful learning in EJA and ensuring consistency with Brazil's national curricular guidelines for computing education.

Inputs:-

The core inputs comprise human, material, and pedagogical resources that enable the educational intervention:

- EJA learners, bringing diverse experiences and perspectives as active agents of the learning process;
- The film The Circle (2017), employed as a reflective and narrative resource to discuss issues of privacy, surveillance, and technological ethics;
- The Structured English Immersion (SEI) methodology, adapted here as a structured, sequential, and interactive learning approach emphasizing conceptual immersion (Krashen & Terrell, 1983);
- Digital devices such as computers, smartphones, and collaborative platforms, providing interaction and experimentation opportunities;
- Facilitator training, grounded in dialogic and critical pedagogical mediation inspired by Freire (1996), ensuring ethical reflection and learner autonomy.

These inputs create hybrid and participatory learning environments that stimulate ethical reasoning, collaboration, and computational literacy (Papert, 1980; Wing, 2006).

Activities:

The planned activities integrate computational thinking, ethical reasoning, and digital agency through active and reflective methodologies:

- Critical film analysis – identifying and discussing ethical dilemmas from The Circle, linking fiction to real-world digital contexts;
- Structured ethical debates – promoting dialogue and argumentation about technology, privacy, and social responsibility;
- Interactive business simulations (SEI) – engaging students in workplace scenarios requiring ethical decision-making and computational problem-solving;
- Reflective writing – fostering metacognition, self-assessment, and synthesis of ethical and digital concepts.

These activities encourage collaborative learning and higher-order thinking, bridging theory and practice within authentic and meaningful contexts for adult learners (Knowles, Holton & Swanson, 2011).

Outputs:

The tangible results of the intervention include:

- Ethical proposals developed by student teams, demonstrating critical understanding and application of ethical frameworks;
- Group presentations illustrating technological problem-solving and collaborative reflection;
- Individual reflective essays, evidencing self-awareness, conceptual mastery, and personal growth.

These outputs serve as indicators of student engagement, ethical awareness, and meaningful learning within digital and professional contexts.

Outcomes (Short-Term):-

Short-term outcomes observed throughout the intervention include:

- Enhanced ethical awareness regarding data privacy, digital rights, and social responsibility;
- Development of computational reasoning, expressed through structured problem-solving and decision-making;
- Increased digital agency, reflecting the ability to act critically, autonomously, and responsibly in digital environments (Couldry & Hepp, 2017).

Such outcomes demonstrate the effectiveness of aligning film-based reflection and simulation-based learning to strengthen the EM13CO08 competency and 21st-century skills.

Outcomes (Long-Term):-

In the long term, the desired impact is the empowerment of adult learners as ethically grounded and digitally capable individuals who can innovate within their workplaces and communities.

This transformative process nurtures:

- Critical digital citizenship,
- Social and environmental responsibility, and
- Lifelong learning abilities (Luckin, 2018; Redecker, 2017).
- By connecting ethical, computational, and cultural dimensions, the model supports sustainable and human-centered digital transformation in adult education.

Conclusion:-

This pedagogical practice demonstrates that computing education, when contextualized through film analysis and active simulations, can empower adult learners to navigate the digital world with critical awareness and agency. Beyond technical proficiency, participants developed a deeper understanding of ethics, privacy, and data responsibility within professional and societal contexts. The experience reinforces the dual role of computing—both as a tool and as a transformative force. Grounded in the BNCC competency EM13CO08, which guides learners in understanding technological change and its implications for digital security, privacy, and personal data protection, the practice fostered learner autonomy and the ability to act ethically and collaboratively in the digital society. By promoting such critical digital protagonism, the intervention contributes meaningfully to the advancement of critical digital citizenship within adult and continuing education, in resonance with perspectives that link computing education to ethical and socially engaged practices (SCHÜNKE et al., 2025).

Acknowledgement:-

The authors would like to thank the students and educators of the Instituto Estadual de Educação Olavo Bilac for their active participation and engagement in this pedagogical practice. Special thanks are extended to supervising teacher Clarice Ramalho Townsend for her continuous support and guidance throughout the development of the activities, and to academic advisor Márcia E. J. Kniphoff da Cruz for her scholarly mentorship, methodological rigor, and encouragement of critical reflection, which greatly strengthened this experience during the Licentiate in Computing and Educational Robotics program at the Federal University of Rio Grande do Sul (UFRGS).

We also express our gratitude to the fellow teachers who collaborated in the execution and dissemination of this practice, as well as to the research and extension programs that contributed to its implementation and outreach within the school community.

References:-

1. BRASIL. Ministerio da Educação. Base Nacional Comum Curricular – Computação. Brasília, DF, 2022.
2. COULDRY, Nick; HEPP, Andreas. The Mediated Construction of Reality. Cambridge: Polity Press, 2017.
3. FREIRE, Paulo. Pedagogia da Autonomia: Saberes necessários à prática educativa. São Paulo: Paz e Terra, 1996.
4. KRASHEN, Stephen; TERRELL, Tracy. The Natural Approach: Language Acquisition in the Classroom. Oxford: Pergamon, 1983.
5. KNOWLES, Malcolm; HOLTON, Elwood; SWANSON, Richard. The Adult Learner. 7. ed. Burlington: Elsevier, 2011.
6. LUCKIN, Rose. Machine Learning and Human Intelligence: The Future of Education for the 21st Century. London: UCL Institute of Education Press, 2018.
7. MCCAWLEY, Patricia. The Logic Model for Program Planning and Evaluation. Moscow: University of Idaho Extension, 2012.
8. PAPERT, Seymour. Mindstorms: Children, Computers, and Powerful Ideas. New York: Basic Books, 1980.
9. W. K. KELLOGG FOUNDATION. Logic Model Development Guide. Battle Creek, MI, 2004.
10. WING, Jeannette M. “Computational Thinking.” Communications of the ACM, v. 49, n. 3, p. 33-35, 2006.
11. SCHÜNKE, Marco Aurelio; HENRIQUES, Renato Ventura Bayan; BARONE, Dante Augusto Couto; SILVA, Rodrigo de Cássio da.Knowledge graphs to assess the impact of educational robotics in basic education: Evidence from practices and internships in a degree program in computer science and educational robotics.Cuadernos de Educación y Desarrollo, v. 17, n. 10, 2025. Disponível em: https://ojs.cuadernoseducacion.com/ojs/index.php/ced/article/view/9110. Acesso em: 6 nov. 2025.