The right to boredom: an eLearning training proposal on the ethical challenges of AI applied to Education

RESEARCH PLAN

EDUCATION IN THE KNOWLEDGE SOCIETY PhD PROGRAMME

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INTRODUCTION

Context

The possibilities given by new and emerging technologies are becoming enactments of what once were just distant fictional displays. The potential of artificial intelligence (AI) releases imagination to such an extent that one cannot tell which one is feeding the other. The promise of functionality pervading Economy, Education, Health, Politics, and every day ordinary life is so-far reaching that some sectors of societies are generating conditions to critically address the challenges brought by this new rationale of development. In what concerns Education, great governmental investments were made across all the continents for the deployment of laptops and interactive whiteboards in schools, combined with wider access to the Internet and even artificial intelligence software (Becker, 2017) and robots (Vitanza *et al.*, 2019; Mondada *et al*., 2017; Mazzoni & Benvenuti, 2015; Wijnen *et al.,* 2015; Mubin *et al.,* 2013).

But were there proportional investments made to explore and determine the kind of usage culture and ethics people want, need and may be able to spread through their technology mediated performances? In fact, works on ethical assessment of the new tech, including AI, seem to gain traction (Brey, 2017; Wright *et al.,* 2014; Kuzma *et al*., 2008; Hofmann, 2005; Weingarten, 2004) and even the European Commission, through the High-Level Group on Artificial Intelligence, recently released the Ethics Guidelines for Trustworthy AI (HLEG, 2019). Among other recommendations on this subject, the European Commission highlights the relevance of ensuring adherence to ethical principles and values (ibd.) and the critical engagement of civil society to discuss AI guiding values (Craglia, 2018).

Leading Questions

Given this context, this study aims at positioning the ethical challenges of emerging technologies, mainly AI, in what concerns the signification of a learning experience – that capacity to collect sense from content exploration through an experience of control and agency – in a formal education set. The conceptual frame of Cultural-Historical Activity Theory, depicted by Lev Vygostsky and Jerome Bruner, makes it possible to explore signification in its sociocultural context and cultural mediation. This theory, reinterpreted by Freire (1987), Engeström (2002; 1987) or Lantolf et al. (2015), will not only cover the personal development made possible through learning, but it will also comprise that sense of agency that makes individuals and communities capable of action towards social practices, even including the educational ones.

Amidst the challenges new technologies pose, artificial intelligence – in the basis of many educational software – is questioning the possibilities of personalising the experience of learning

in tempting ways. In fact, AI is creating great opportunities in special educational needs (Benmarrakchi et al., 2019; Drigas & Ioannidou, R. 2012) – e.g., dyslexia, dyscalculia, attention disorders, and autism. It is also promising that once AI solves more routine tasks related to operations and actions of formal education, it will be able to push learning towards more developmental models (Tuomi, 2018) and, therefore, more holistic, transferable and generative competencies, expectantly linking knowledge to wisdom. But when artificial intelligence enables software capable of measuring instant emotional feedback to learning content through facial-recognition technology that scan students during classroom time, are we giving personalised learning a chance or avoiding the personal right to boredom? In fact, much personal learning is in-formed through experiences we would rather avoid. Specially in a time of critical development, what is the value of recognising what hooks us and of what annoys us? And how can personalisation be put apart from an experience of control, recognition, and agency? This kind of software, besides the critics on its vocation for surveillance, may create the conditions to inhibit expression and recognition of one's feelings towards objects and subjects, blunting the experience of meaning that is expected to enable transferable learning.

WORKING HYPOTHESIS AND PRINCIPAL OBJECTIVES SOUGHT

Key Question:

This work aims at understanding *if and how* ethical impact assessment of AI, in what concerns the signification of a learning experience – and its direct correlation with identity development –, (1) influences primary teachers' capacity to design learning sequences that intentionally and systematically address the challenges AI poses to learning signification processes, (2) benefiting students' critical thinking upon AI. This assessment comprehends the use of narratives, in the context of hypothetical scenarios, integrated in a Continuing Professional Development (CPD) eLearning course (García-Peñalvo, 2008; García-Peñalvo & Seoane-Pardo, 2015).

General goals:

1. To understand the critical ethical dimensions of AI applied to Education (AIEd) in what concerns the experience of learning signification, considering the perspective of different educational stakeholders.

2. To contribute for the public debate about AIEd through the development of conceptual insights and theoretical frameworks to analyse its critical dimensions.

3. To develop a content framework for eLearning courses targeting teachers' capacity to accurately address the challenges posed by AI applied to Education that has impact upon students' capacity to critically think about AI.

Working questions and corresponding specific goals:

Phase1. Grounded theory-based design of a framework for teachers' Continuing Professional Development through training in AI applied to Education

1st What is the relationship between ethical impact assessment through narrative exploration and the process of designing a hypothetical scenarios' plot in a participatory shared process?

> a. This study aims at exploring to what extent the (1) context frame, (2) technologies, (3) applications, (4) drivers, (5) ethical issues, (6) existing controls, and (7) conclusions may be critical to start evolving in the discussions of AI use in the educational field.

2nd How does the process of solving an AI ethical dilemma in group relates to teachers' narrative quality, when exploring AI educational ethical challenges, providing directions on Continuing Professional Development needs?

> b. Through this process, this study intends to favour teachers' capacity to explore AI impact on learning and across students' different developmental milestones.

3rd How does the incorporation of content generated in participatory processes – as those described above – benefits an eLearning course on AI application challenges in the educational field?

> c. This participatory research design is expected to generate content that more immediately responds to teachers' current attitudes (cognitive, affective, behavioural) and needs on AI application to the educational field.

Phase2. Training course framework accuracy evaluation through participation quality

4th How does the participation in an eLearning course that incorporates a specific body of contents and critical strategical socio-constructivist approaches to AI ethical impact assessment enhances teachers' capacity to intentionally explore the potential and limits of using AI for students' benefit in their everyday practices?

> d. This course intends to enhance teachers' capability to intentionally and meaningfully address AI ethical challenges in learning planification's for their

students, preserving the conditions that enable an effective learning whatever the resource in use.

5th To what extent does the participation in an eLearning course, that incorporates a specific body of contents and critical strategical socio-constructivist approaches to AI ethical impact assessment, enhances teachers' capacity to intentionally promote students' critical ethical thinking upon AI challenges?

      e. This course intends to enhance teachers' capability to explore AI ethical thinking in primary students.

METHODOLOGY

The research methodology – under an ethical code of research (BERA, 2018) – will be mainly qualitative, comprising data triangulation.||**Phase 1. Grounded theory-based design of a framework for teachers' CPD through training in AI applied to Education**||Variables: (1) narrative shared participatory methods and the (2) capability of ethically reason upon AI applied to Education.||**1st Question.** The Delphi Method (Dalkey & Helmer, 1963; Helmer, 1966; Hasson *et al*., 2000; Green, 2014; Seker, 2015) will be implemented (once it is useful to generate ideas when there's a controversial theme) to explore the following variables: (1) context frames for AIEd, (2) AI educational technologies, (3) AIEd applications, (4) usage drivers, (5) ethical issues involved, and (6) existing controls. The structure is planned as follows: 1.1.Selection/invitation of a group of circa 10 experts (*e.g.,* European Commission HLEG on AI, researchers on Philosophy of Technology, worldwide Educational specialists experienced in ICT integration, and AI software developers) from different geographical realities (snowball method), with experience on tech applied to Education or in AI software development (both criteria to be met, not necessarily in the same personal profile). 1.2. Participants will be challenged (email) to express their opinions on AIEd (*i.e.,* context educational frames, tech, and applications from data on AI). 1.3. This data will enable the construction of a survey questionnaire. 1.4. Participants will (a) rethink their first responses – facing previous answers – , (b) choose the 2 main critical items for each criterion, and (3) conclude on the drivers, the potential ethical challenges, and the current existing controls. Data will be analysed through descriptive statistics that will be further shared with the experts. 1.5. These new ideas will be voted by the group to define a final list on each criterion that will be the basis for the participants to create a hypothetical dilemma reflecting an ethical challenge posed by AIEd. 1.6. Participants will vote the 3 dilemmas that better explore the ethical challenges of AIEd. 1.7. Results will be shared with the entire group.|| **2nd Question.** 2.1. A focus group of

circa 7-10 (Krueger, 1991) teachers will be exposed to 3 ethical dilemmas (resulting from the previous research design) to choose the most impactful 1 concerning learning signification and students' development, justifying their choices (considering the role of a deliberated educational process). 2.2. Teachers are expected to highlight potential consequences to students' development resulting from the use of the tech presented in the dilemmas under the described circumstances (or others). 2.3. Teachers will be also invited to explore the needs of a school community in what concerns AIEd. 2.4. This content will be analysed (using a CAQDAS) to extract teachers' current attitudes and subsequent explicit or tacit CPD needs.||**3rd Question.** 3.1.The focus group's body of content (as well as the output from the previous research phase) will be the basis for designing the programme content, methodologies, activities, course length (and corresponding authoring tool) of a socio-constructivist eLearning course under the ADDIE model (Selvaraj, 2015; Bamrara & Chauhan, 2018). 3.2. The accreditation of this course would be a helpful prerequisite to enrol teachers.||**Phase2. Training course framework accuracy evaluation through participation quality**|| Variables: (1) body of contents rose in the phase 1 plus the pedagogical strategies implemented through an eLearning method and the (2) capability of ethically reason upon AIEd and promote students' critical thinking on AI.||**4th Question.** 4.1. A group of around 20 teachers (Torrecilla *et al.,* 2016) – mainly from Portugal, but desirably including teachers from a different continent – will be invited to complete the online course. 4.2. A qualitative data collection moment on attitudes towards AIEd will be included in the initial and final phases of the course (research purposes integrated into a learning perspective continuum). 4.3. Throughout the course teachers will (1) explore the effects of AI ethical challenges upon learning signification, (2) design a learning session that comprises the main challenges settled under a curriculum continuum approach, (3) role-take that learning sequence, and (4) develop self-assessment on that rollout. ||**5th Question.** 5.1. This aim comprehends the pedagogical infusion of 1 (or more) AI ethical critical dimensions into 1 curriculum goal (*e.g.,* digestive system; fables). The teachers will be encouraged to explore students' AI ethical thinking and then reflect upon the results. The assessment of these results will be made (using a CAQDAS) considering the affective-cognitive psychological processes that might have been explored through the task (concerning students' outputs). 5.2. A group of around 5 teachers will be invited to a final semi-structured interview (face-to-face or virtual) to grasp teachers attitudes towards AIEd in what concerns the learning experience processes (including background and the impact of their participation in the eLearning course). The eLearning characteristics that might have contributed to those results will be explored along with the teachers' perception on their capability and will to continue dealing with the ethical challenges AI may pose to formal educational environments. The questions will also comprise the main criteria teachers consider relevant for CPD on AIEd.

MATERIAL MEANS AND RESOURCES AVAILABLE

This work, developed under the PhD Programme "Education in the Knowledge Society" (García-Peñalvo, 2014, 2018; García-Peñalvo et al., 2017, 2018), will benefit from the use of a portal (accessible from http://knowledgesociety.usal.es), which is the main tool for communication and report on advances (García-Holgado et al., 2015), as it incorporates all publications, placements and attendees to conferences during the course of this work.

Technologies:

Laptop with internet connection, record and productive tools; file sharing software (Delphi method implementation); Computer Assisted Qualitative Data Analysis Software – NVivo –; instructional design authoring tools for the eLearning course; SPSS.

Bibliography:

• digital libraries and repositories (e.g., Jstor; USAL, FLUP and FPCEUP digital libraries);

• books for critical literature review (e.g., theme: Shanahan, M. (2015). The Technological Singularity. London: The MIT Press Essential Knowledge Series. || method: Denzin, N.K. and Lincoln Y.S., eds. (1994). Handbook of Qualitative Research. London: Sage Publications.)

• thesis and monographs [e.g., Wang, R., Reis, J. Crosta, L., Edwards, A., and Mudaliar, M. (2018). The use of social media and artificial intelligence tools by online doctoral students at the thesis stage. doi: 10.20472/TEC.2018.006.006]

• minutes and reports (e.g., European Commission digital single market – reports and studies);

• electronic journals (e.g., International Journal of Artificial Intelligence in Education).

Research and Intervention resources: semi-structured instruments protocols (initial, survey, focus group, interview) and questionnaires developed from data analysis; eLearning course programme content.

TIMING SCHEDULE

Phase	Main Tasks	Time frame
Phase 1. Literature review	Research of relevant critical data on the main study constructs on hardcopy or digital books, online academic data bases, electronic papers, and educational portals.	Throughout the thesis rollout
Phase 2. Study object	Exploration of critical study items, constructs, hypothesis, variables, and research methodology.	March, April, May, June 2019
Phase 3. Research design and evaluation	Sample definition, identification and first contacts establishment. Research instruments design for the Delphi method implementation and for the focus group.	May, June, July 2019
Phase 4. Data collection for the theoretical and conceptual exploration component	4.1. Implementation of the Delphi method: several rounds of iterative data collection and ongoing analysis.	August, September, October 2019
	4.2. Focus group implementation and further analysis.	November, December 2019 and January 2020
Phase 5. Project intervention design and implementation	5.1. Design of a socio-constructivist eLearning course under the ADDIE model with the content resulting from the focus group data analysis. Creation of conditions for course accreditation.	February, March, April 2020
	5.2. Implementation of school clusters meetings and identification of a pool of teachers to enrol in the course. Teachers participation in the eLearning course designed and learning session role-take.	May, June, July, August, September, October, November 2020

Phase 6. Dissertation and reports on research data	Course participation data analysis, thesis content writing, research reports, conclusions drawing.	December 2020 and January, February, March, April, May, June, July, August, September 2021
Phase 7. Research dissemination	Outreach activities in summits, conferences, and worldwide congresses – research data exploration among peers.	Transversal work throughout the thesis.
Phase 8. Dissertation public defence	Dissertation presentation and defence.	2021 (final trimester).

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