Assessment as learning through digital portrayals: Exploring how educational technologies can help students make sense of the teacher-researcher's role

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Pre-service teachers are expected to acquire the knowledge, skills and competencies necessary to teach effectively in school after their education programmes. Given the complexity of the teaching profession and the challenges associated with the school induction phase, students should be supported in developing an awareness of their professional profiles when they graduate. This study aimed to understand the experiences of 206 final-year students engaging in an assessment as portrayal activity consisting in creating a multimedia representation of themselves as teacher-researchers. A qualitative analysis of the analytical sheets was conducted to understand the teacher-researcher characteristics acquired as a professional posture, the overall benefits gained and the influence of educational technologies on the task. The results show that through assessment as learning, the students activated self-assessment and metacognitive processes, which led them to develop an awareness of areas of the teaching profession previously not considered relevant, such as reflective and research skills. Thus, the assessment as portrayal method implemented through educational technologies contributed to elaborating and conveying a self-representation as a teacher-researcher. Given the considerable cognitive engagement required of students, further studies could explore the use of artificial intelligence to support students in activating metaphorical thinking.

Implications for practice or policy:

- Higher education students can actively engage in assessment activities through self-feedback processes.
- Students can understand how to leverage educational technologies to communicate information relevant to their professional profiles.
- The outcomes of sustainable assessment with regard to self-regulated learning can support graduates when they start teaching.
- Course instructors can promote the development of students' life skills through metacognitive processes' activation.
- Course leaders can comprehend graduates' professional profiles through assessment as portrayal activities.

Keywords: teacher-researcher, higher education, assessment as learning, assessment as portrayal, educational technologies, qualitative research.

Introduction: What skills does a teacher-researcher need?

The *teacher-researcher*'s profile has been recognised in the academic literature since the second half of the last century. For example, according to Bissex (1986, p. 483), who defined the teacher-researcher as "an observer, a questioner, a learner, a more complete teacher", the teacher-researcher is an educator who examines teaching and learning practices with the aim of enhancing them. This dual role involves both teaching and conducting research, typically in a classroom setting, to gain a deeper understanding of educational processes and outcomes. A professional profile characterised by this approach highlights the significance of not only educational and disciplinary but also heuristic and reflective competencies,

incorporating them into the core competencies of the teaching profession (Caena, 2014). The development of reflective skills enables teachers to reflect before, during, and after an educational experience, gain awareness of the experience and develop the practical wisdom necessary to handle situations for which no set procedures are available (Schön, 1983). Heuristic skills are essential for teachers, as they enable them to navigate complex, dynamic classroom environments by identifying problems in their teaching practices that may directly impact students' learning and thus require investigation. Analysing data related to specific educational contexts allows the formulation of a response to the identified needs and facilitates professional growth that benefits both the individuals involved and the broader educational community. Such competencies should be modelled at the beginning of teacher graduate courses and training programmes (Gutman & Genser, 2017). Initial teacher education, the first step in a teacher's professional journey, should build a professional mindset based on being both a learner and a teacher. This is extremely demanding and involves all personal resources because "the first and foremost resources teachers use are themselves" (Caena, 2014, p. 2). Therefore, pre-service teachers need to develop a wide range of skills and competencies to navigate the complexities of the teaching profession. However, teacher education programmes often do not adequately support students in developing an awareness of their professional identities (Hanna et al., 2020). This study aimed to address this shortcoming by examining the experiences of 206 pre-service teachers participating in an assessment as portrayal (AaP) activity in which they created multimedia representations of themselves as teacher-researchers as an authentic task. Through a qualitative data analysis, this study explored how this activity fostered metacognitive processes related to the personal and professional posture of the teacher-researcher while considering the role of educational technologies in coping with the given task.

Promoting self-understanding through evaluation strategies: Contribution of the AaP activity

AaP is deemed to be an effective strategy in supporting students' reflection and awareness, as it "provides students with the opportunity to construct a representation of their personal and professional selves, their achievements, their image, enabling them to understand how these elements can be communicated/transferred in potential work contexts" (Ajjawi et al., 2020, p. 66). Students can learn to present multiple versions of themselves in line with the expectations of the teaching profession. This approach to assessment, which allows students to articulate their learning achievements through multimedia representations, aligns with persona studies. The term persona refers to the construction of a strategic identity related to a specific role undertaken by an individual. In this way, an explicitly subjective dimension is introduced into an assessment (Bloxham et al., 2016). Therefore, persona studies offer a tool for inventing authentic forms of assessment that can ascribe significance to the interconnected world of work and study (Ajjawi et al., 2020). The objective is to foster awareness of one's presence in a context and interaction with others and to have this role recognised by the community (Marshall & Henderson, 2016). AaP can be considered part of the assessment as learning approach because it enables learners' reflection in relation to becoming (Marshall et al., 2015) and provides a space for questioning who they are and what they stand for (Clarke & Boud, 2016; Vu & Dall'Alba, 2014). When an assessment requires students to accurately portray their knowledge and skills, it helps to create learning opportunities. Through assessment as learning, students can actively engage in the learning process. Assessments are not merely tools for measuring learning outcomes but become integral components of the learning process (Yan & Boud, 2022). Thus, the AaP approach, while innovative in fostering metacognition among pre-service teachers, requires them to engage in complex learning processes, increasing their cognitive load. Furthermore, while it encourages a deeper understanding of professional identity, it risks being perceived as difficult to assess reliably, as portrayals may vary widely in quality and interpretation. Lastly, the effectiveness of using technology, which is central to this approach, can be influenced by students' varying levels of digital literacy, potentially producing disparate outcomes.

Leveraging technologies to enhance learning and assessment

Assessments have always played a critical role in students' careers, and universities are trying to respond to this challenge with solutions aligned with the modern digital world. Despite the digital transformation, the possibility of leveraging new means of implementation and university teachers' perceptions of technology-supported assessments as contemporary and innovative, the fundamentals of assessment design do not seem to change or evolve (Bearman et al., 2020) because educational technologies merely reproduce established academic practices (Selwyn, 2014). There is a need to experiment with multiple technologies in formative assessment practices (Sembey et al., 2024). The fourth industrial revolution and the post-digital era demand that assessment practices in higher education be reimagined and technologies be exploited not only to promote personal and professional growth (Janse Van Rensburg et al., 2021) but also to make a positive impact on students' communities. From this point of view, the AaP approach represents a valuable application of Magana's (2017) studies, as multimedia representations can meaningfully insert digital technology into authentic assessments (Nieminen et al., 2023), thus aligning learners with contemporary society (McArthur, 2022). This openness to external influences explains why multimedia representations can serve as valuable tools for authentic assessments. This approach should be favoured over written or graphical forms because expressing one's inner world through multimedia reshapes one's relationships with oneself and others. In contrast, written representations tend to be primarily descriptive, while graphical representations, despite shifting the focus from expression to interpretation, could often remain self-referential. Even though technologies are used in this specific context as a strategy to promote authentic assessment practices, tackling this task offers students an additional opportunity to strengthen their digital skills, which are an integral part of the teaching and learning processes (Chaw & Tang, 2024). It is indeed important to seize every possible opportunity to support students in developing digital literacy because, due to the relentless and exponential advancement of technologies, it is not always possible to dedicate the necessary time and resources, given the multitude of competencies that must also be conveyed.

Method

Research context

This study explored the experiences of two cohorts of students who attended a three-credit participatory research course (36 hours) and a one-credit workshop (12 hours) in the context of a combined bachelor's + master's degree in primary teacher education at the University of Verona (Italy). This course is part of the final year of the programme for two reasons. First, it supports students who need to prepare for their final-year internships and theses through an educational research approach. Second, it aims to complete students' reflections on the role, posture and functions of the teacher-researcher, as the entire study programme fundamentally aims to train teachers as reflective professionals. Specifically, the programme aims to ensure the attainment of objectives in terms of knowledge (understanding and recalling the paradigmatic and epistemological foundations and the main methods and strategies of participatory research), attitude (ability to critically reflect on the development of a reflective teacher-researcher) and competence (ability to conduct participatory research in early childhood and elementary education).

To reflect on the internalisation of the teacher-researcher's attitude, the students were asked to create a multimedia representation of themselves as teacher-researchers at the end of the programme. During the course, the students were required to keep a reflective journal in which they noted all the significant elements in their growth as pre-service teachers. At the end of the course, they were asked to review their journals, identify significant elements representing their personal and professional selves and translate them into metaphors to create a multimedia representation. This assessment task was in line with the AaP framework, as the students were asked to develop a representation of their personal and professional profiles as an outcome of their learning paths. The task allowed them to build an awareness of the elements related to the teacher-researcher's professional profile, which often remains implicit, to understand how such elements can be communicated in work contexts through contemporary means of communication, such as social networks. A metaphorical multimedia representation was preferred to a

written representation, which often risks becoming exclusively descriptive. The elaboration of a metaphor necessarily involves activating an interpretative process of knowledge through which an individual symbolically expresses a concept or experience by drawing on their experiences, emotions and thoughts to find suitable images to convey the intended meaning. Therefore, when using a metaphor, one reflects not only on the nature of a particular concept but also on how this concept is personally experienced and interpreted (Sheehan, 1999). According to McIntosh (2010), these are intentional (rather than spontaneous) images whose details emerge through storytelling and require an explication of the symbols used.

Analytical sheets used at the end of the task served a dual purpose. First, they prompted students to reflect on the gains obtained from this task and, more broadly, on their study paths. Second, they helped students communicate the personal meanings underlying the metaphors. To these aims, the students were asked the following five questions:

(1) For each of the elements you included in the multimedia representation, describe their characteristics and make explicit their meanings, with reference to the reflective annotations in the journal to which you have referred.
(2) What have you learned through this task concerning teaching professionalism, as well as in relation to yourself?
(3) Do you believe that the hypothetical prospect of putting this representation online influenced the creation of your product?
(4) How do you consider the creation of a representation as a tool for reflecting on the acquisition of useful elements related to the posture of the teacher-researcher?
(5) What positive aspects and challenges do you identify in this task?

With the integration of this metacognitive activity, the multimedia representations became an assessment as learning tool. The students were required to construct a self-representation based not on a general reflection on the teacher-researcher but on seeking, interrelating and using the evidence recorded in their reflective journals. Therefore, the assessment task provided the students with an opportunity to critically reflect on their professional growth based on evidence, thereby forming an evaluative judgement of the embodiment of the constitutive characteristics of the teacher-researcher's posture (Yan & Boud, 2022). No specific guidance was provided on the technologies to be used to create the multimedia representations. One reason for this was that the cognitive load of the course was already heavy, and enhancing digital skills was ultimately an indirect gain. Another reason was that, as previously noted, the use of technologies primarily aimed to facilitate reflective processes regarding the students' teacher-researcher profiles. For these reasons, the students were informed that any type of technology that enabled them to express themselves was acceptable.

Research design

This study aimed to understand the experiences of university students involved in an AaP activity in which they were asked to develop a multimedia representation of themselves as teacher-researchers. The investigation was guided by three research questions:

(1) What characteristics of the teacher-researcher do students believe they acquired in terms of personal and professional posture?
(2) What overall gains did students obtain from the AaP task in question?
(3) To what extent did the requirement to create a multimedia representation influence the elaboration of the task?

A qualitative research design was employed to answer these research questions by gaining a deep understanding of the students' perceptions of the professional role developed and the task performed. The analytical sheets completed by 79 students in the academic year 2021–2022 and 92 students in 2022–2023 were subjected to inductive content analysis (ICA, Elo & Kingäs, 2008). This type of analysis enables a concise yet comprehensive description of a phenomenon through the generation of labels and categories that help to construct models, systems and conceptual maps, thereby facilitating the researcher's understanding. Compared to other analytical methodologies, such as framework analysis,

ICA enables a participant-centred approach that ensures that the analysis remains grounded in individuals' actual experiences and viewpoints. Unlike deductive methods, which use pre-defined categories or theories, the open-ended and flexible approach employed in ICA allows researchers to identify and explore themes that may not have been anticipated, which is crucial for capturing the rich and diverse nature of personal reflections. Each participants' quote has been associated with a code, for example (2.73a), which identifies (a) the number of the student's cohort, (b) the number of the student, (c) the quote. The percentages are calculated on the total of the analytical sheets analysed (171).

Findings

Characteristics of the teacher-researcher outlined through metaphors

Of the 91 students who attended the participatory research course during the academic year 2021–2022, 79 submitted multimedia representations (86.8%). Among them, 45 students (57%) employed at least one metaphor and 34 students (43%) paraphrased study texts. In 2022–2023, of the 115 students who attended the course, 92 (80%) submitted multimedia representations. Of those, 73 students (63%) used at least one metaphor, and 42 students (37%) paraphrased study texts. In this study, only the metaphors were analysed. The metaphors were grouped into macro- and micro-categories emerging through the formulation of descriptive labels derived from the meanings explicitly attributed by the students to their metaphors in their analytical sheets. The macro-categories used as organising concepts to present the research results were cognitive processes (Table 1), personal attitudes (Table 2), the relational dimension (Table 3) and engagement with contexts (Table 4).

Cognitive processes

Table 1
Metaphors related to the teacher-researcher's cognitive processes

Categories	Metaphors	No. of labels
Planning	Architect (2), Child measuring himself with a tape measure, Creating a stage costume	7
Observing	Bee, astronomer, Binoculars, Weather map, Class, Teacher lowering him/herself to child height, Photography, Magnifying glass (5), Glasses (6), Eye, Scientist with his microscope, Mirror (2), Camera, Train, Clover	31
Listening	Headphones (3), Heart, Echo, Open window, Eyes and ears, Puzzle, Recorder (2)	11
Documenting	Notes, Folder, Sound box, Diary, Two tables, Writing hand, Multiple tools for collecting data (2), Narrator, Pen (3), Post-it, Notebook (5), Recorder and camera, Radio sports commentator	21
Reflecting	Jar, Scale, Screwdriver, Brain and heart shaking hands, Brain, Rabbit, Diary, Philosopher, Buck game, Looking out the window, Teacher swamped with questions, Walking, Light bulb, Magnifying glass, Media control symbols, Speech bubble (2), Clock, Parenthesis, Thinker (2), Meditative posture, Question mark (3), Puzzle, Spider web, Rose, Writing, Mirror, Head with a little man inside that sheds light	35
Researching	Children rotating a globe, Music box, Investigator (3), Light bulb, Magnifying glass (3), Books, Lifeblood, Glasses (5).	17
Analysing	Computer with database, Pie chart, Pad, Books, Computer, Charts, Detective with magnifying glass, Map	8
Co-constructing knowledge	Cubist work, Playing together with construction set	2

Planning. The teacher-researcher adopts a multifaceted approach characterised by a tailored educational design, iterative refinement (transferability), meticulous attention to detail, acknowledgment of the uniqueness of each situation and a focus on enhancing students' quality of life. They meticulously craft and adapt educational pathways to suit students' needs and requirements, drawing on diverse forms of knowledge while collaboratively identifying objectives with students and ensuring a customised and effective learning journey.

Observing. The teacher-researcher's approach focuses on observing the context at hand to gain a nuanced understanding of reality, encompassing scrupulous attention, self-reflection, and critical thinking to inform decision-making. Systematic participatory observation aids in identifying students' needs and appropriate strategies. It serves as a foundation for data collection and enables a deep comprehension of evolving contexts, fostering adaptability and informed action. This multifocal vision integrates diverse viewpoints, prioritising observation without judgement and continuous refinement based on detailed insights to ensure a responsive and effective pedagogy.

Listening. The teacher-researcher listens and empathises without judgement, creating an open environment receptive to emotions and needs and fostering reciprocal communication. They embrace individual perspectives, understand classroom dynamics, and welcome diverse viewpoints. They cultivate critical thinking to enable students to engage with alternative perspectives through dialogic exchanges. Through listening and speaking, they facilitate co-constructed discussions that enable reflective practices.

Documenting. The teacher-researcher tracks observations through a detailed documentation of his/her practice, thoughts, and emotions for reflection. Employing various tools, they annotate materials to enhance contextual quality of life. They leverage writing to recall experiences, select tools based on objectives, and engage students in documenting learning processes. By uncovering tacit knowledge, they reconstruct situations to promote a deeper understanding thereof and collect data that can be used for deliberative enhancement and reflective development. They convey surrounding realities, fostering continuous analysis and contributing to knowledge construction.

Researching. The teacher-researcher observes and analyses the context at hand, noting every detail with fidelity. They approach phenomena with curiosity and investigate them to understand and improve them. By scrutinising reality, they foster innovation and students' well-being. They focus on elements within a framework of holistic and deeply analyse situations to fully understand them. Leveraging heuristic skills, they propose innovative pathways while continuously investigating the context at hand to foster thought and reflection.

Analysing. The teacher-researcher initiates change based on evidence and data analysis to reflect on the teaching practice together with other practitioners. They document not only outcomes but also processes using diverse analytical tools to understand the learning environment. They develop conceptual frameworks for further exploration by identifying and organising key concepts.

Co-constructing knowledge. The teacher-researcher constructs knowledge through continuous engagement with other practitioners, evaluating processes from different perspectives. Being part of a community allows teachers-researchers to increase their teaching capacities and promotes a holistic understanding of the learning experience.

Personal attitudes

Table 2
Metaphors related to the teacher-researcher's personal attitudes

Categories	Metaphors	No. of labels
Motivation	Living room, Fireplace, Eyes that observe, Work, Sport, Apron	8
Orientation towards continuous improvement	Bottle of water (2), Acrobat, Adult helping a child to hold a pencil to write with his hands, Architect, Rainbow, Artist, Athlete in the starting blocks, Magic wand, Scales, Track that doesn't lead anywhere, Boomerang, Easel with canvas, Pair of tightrope walkers, Rubik's cube, Chef (2), Heart (2), Explore, Flower (3), Photo, Gardener (3), Garden, Jiminy Cricket, Watering plants, Colorful and creative light bulb, Leaving a mark in the diary, Washing machine, Padlock with a heart inside, Hands, Gavel, Doctor (2), Hot air balloon, Music, Cloud, Clock (2), Poppy, Paintbrush, Goldfish jumping out of the aquarium, Potted plant, Pine cone, Peppermint Patty, Painter, Tibetan bridge, Psychologist, Question Mark (2), Roots or soil, Making a Hole a Resource, Portrait, Wet Rock, Climber, Steps with Arrow Going Up, Squirrel, Mirror (3), Restart Button	79
Creativity	Architect, Rainbow, Artist, Easel with canvas, Chef, Colorful and creative light bulb, Paintbrush, Painter	11
Taking care	Bottle of water, Chef, Heart, Heart, Flower (2), Gardener (3), Watering, Washing machine, Padlock with a heart inside, Hands, Music, Clock (2), Peppermint Patty, Psychologist, Roots or soil, Mirror	25
Educational wisdom	Scales, Rubik's cube, Jiminy Cricket, Mirror, Gavel, Wet stone, Atlas that raises the world, Wheat	8
Staying in uncertainty	Water coming out of a bottle, Acrobat, Athlete in the starting blocks, Track that leads nowhere, Pair of tightrope walkers, Cloud, Clock, Poppy, Tibetan bridge, Question mark (2), Making a hole a resource	17
Personal dimension	Leave a mark in the diary, Photo, Mirror, Portrait	4

Motivation. The teacher-researcher embodies self-expression, tenacity in the pursuit of goals and appreciation for small wonders in the educational context. They recognise and question their abilities, are resilient in the face of errors and are driven by a passion for achieving goals.

Orientation towards continuous improvement. The teacher-researcher continually updates themselves to meet new challenges, balancing theory and practice. They flourish in skill development through perseverance and nourish curiosity and visionary thinking. Being reflective and innovative, they question, explore and adapt practices to foster student growth ethically and empathetically. They create a safe, nurturing environment that promotes collective flourishing while valuing each individual. They are characterised by integrity and embrace feedback and self-assessment for continuous improvement.

Creativity. The teacher-researcher values diverse skills, knowledge and tools, adding innovative touches. They engage in self-exploration through inventive methodologies, fostering creative thinking stimulated by curiosity and imagination. They creatively recombine resources to meet students' needs, tailoring solutions to each classroom context. They develop original, engaging practices by departing from established theories and embracing an innovative personal perspective beyond conventional boundaries.

Taking care. The teacher-researcher nurtures students' potential while respecting their privacy, balancing ingredients for their growth, and adapting educational interventions to their needs and realities. They listen, advise, maintain positivity and value each student and their emotions. They are guided by ethical principles in creating the conditions necessary for students to flourish, fostering empathy and

exemplifying positive values. They cultivate constant learning, allow time for reflection and establish trust-based, sustainable educational relationships through collaborative efforts.

Educational wisdom. The teacher-researcher evaluates themselves and research outcomes, acting with integrity while remaining open to external influences. They self-reflect to understand their strengths and limits, seek actions that can unlock students' potential and humbly balance their personal passion with empirical assessments. They adopt a service-oriented stance, leveraging the advantages of teamwork to make a difference.

Staying in uncertainty. The teacher-researcher learns to cultivate doubt, acknowledge frustration, and seek balance in the face of contextual changes. They view uncertainty and curiosity as catalysts for research, waiting for the right moment to act and understand implicit contextual cues. They prioritise impartiality over hasty judgements, remaining flexible and acknowledging their vulnerabilities, thereby promoting continual self-transformation. They adapt to unpredictability, maintain an internal contextual equilibrium, confront fear and self-doubt with courage, utilise doubt as a knowledge engine and embrace the questioning of and reflection on educational practices.

Personal dimension. The teacher-researcher understands that external appearances are the result of fleeting perceptions of a complex reality. They discuss personal experiences to convey meanings embedded in words and actions and to illustrate their journeys to their current states.

Relational dimension

Table 3
Metaphors related to the teacher-researcher's relational dimension

Categories	Metaphors	No of. labels
Collaboration	Atlas lifting the world, Mouth and ear, Rowers, Chain, Computers, Research community, Sharing glasses, Ants, T-shirt, Hands holding each other, Orchestra, People sitting at a table (2), Community practice, Puzzle (2), Branch to bring together, Net, Seamstress weaving the threads of a fabric, Scoubidou, Rudimentary tool made with thread and glasses, Canvas, Weaver, Shared journey	25
Management	Agenda, Captain of a football team, Hourglass, Computer, Community, Conductor (3), Abstract design with coloured dots connected to each other by some lines, Woman at the helm of a boat, Ship, Maritime pine, Puzzle, Smartphone, North Star, Tandem	22

Collaboration. The teacher-researcher lives within and contributes to practitioners' communities. By creating collaborative spaces and valuing social learning, they cultivate cohesive educational communities, navigating shared meanings and providing mutual support to achieve collective objectives through dialogue and diverse perspectives, thereby embarking on a shared growth journey.

Management. The teacher-researcher identifies common goals, plans activities, manages classroom dynamics and navigates complexity by observing cues from students. They coordinate diverse roles, approach a choice responsibly and promote overall harmony. They navigate project complexities, facilitate learning and manage time effectively. Through teamwork, they contribute to dialogue and foster shared creation. Together with colleagues, they synergise efforts, provide timely feedback and leverage collective strengths to broaden their perspectives and enrich knowledge.

Engagement with contexts

Table 4
Metaphors related to the teacher-researcher's engagement with contexts

Categories	Metaphors	No. of labels
Complex environments	Beehive, Forest and seabed, Sky covered with clouds, Fruits salad, Orchestra, Flower meadow (2), Question mark, Puzzle, Stream, river or lake	17
Complex processes	Construction site, Cooking, Domino, Photos from the past, Ball of yarn, Footprints, Orchestra, Network, Hurdle jumping, Climbing, Sneakers, Spiral, Road, Walk, Cake, Mosaic, Modelling clay	18
Available resources	Books (12), Toolbox (4), Backpack, School documentation and regulations, Exclamation mark	19

Complex environments. The teacher-researcher navigates evolving educational contexts, acknowledging mutual influences and contextual fluxes. They grasp nuanced dynamics, critically examine reality and remain present. They recognise each student's uniqueness and foster harmony through understanding. They weave the curricular and extracurricular realms into an educational community, emphasising active participation. Through care, work, research and reflection, they nurture growth in teaching and research. By acknowledging each context's uniqueness, they unify diverse perspectives while respecting individual talents to achieve collective growth.

Complex processes. The teacher-researcher is adept at handling unpredictable complexities and adapting to contextual needs and unforeseen circumstances. They embark on challenging journeys, overcoming obstacles with professionalism and reflexivity and investing time and energy purposefully. They confront open questions, self-evaluating to achieve goals and emphasising the importance of monitoring and feedback to adjust actions collaboratively. They blend various factors and values with pre-determined paths, using diverse tools for an innovative, personalised approach that adeptly integrates theoretical and practical dimensions.

Available resources. The teacher-researcher grounded their teaching practices on foundational theories, using the knowledge, skills and attitudes they have acquired from education and experience. Academic literature is a pivotal resource that informs educational designs, while continuous learning and research reinforce competencies. With a solid theoretical foundation, they flexibly and creatively integrate theory and practice, organising knowledge logically, fostering clarity and leveraging prior and ongoing learning experiences to develop an effective educational design.

Instead of using a variety of metaphors, 31.6% of the students (54 in total: 14 in the academic years 2021–2022 and 40 in 2022–2023) employed a single complex metaphor whose constituent elements referred to various characteristics of the teacher-researcher. The metaphors, whose meanings can be traced back to the metaphors illustrated above, referred to the following:

- the dimension of leadership: coach (2), ship captain (2), choir director (1)
- the complexity of the context or processes: cooking a recipe (6), human body (3), architect, choreographer, knitting, organising a party, buying a gift, describing a city, flowerbed, volleyball
- the dimension of care: cultivating (5), gardening (3), nursing, volunteering, scouting, reader, painter, music, dance and yoga
- the dimension of discovery or adventurousness: journey (7), explorer, diver, mountain biking, mountain hiking (2), climber, walking in nature (2), air travel, archaeologist.

Students' personal and professional development through AaP

Based on the answers to the question "What did you learn about teaching professionalism and yourself?", five categories emerged (Table 5). These categories encompassed various aspects related to the students'

personal and professional development, particularly in connection with the creation of the multimedia representations.

Table 5
Coding regarding students' personal and professional development through AaP

Categories	Labels	No. of labels
Matured values	Reflection (37), Research or being teacher-researchers (21), Sharing, collaboration, and comparison (16), AaP, writing, reflective diary (6), Formative assessment (4), Communication (5), Contextual design (3), Care, others and respect (7), Co-construction of knowledge (2), Continuous professional development (12), Innovation (3), Creativity (7), Flexibility (5), Conscious action (5), Educational relationship, Digital (12), Investing in education, Link between theory and practice (3), Observation (11), Positive or active learning environment (3), Get involved (5)	169
Developed competences	Heuristic competence (11), Reflective competence (28), Digital competence (21), Communicative competence (17), Disciplinary competence (2), Design competence (8), Evaluative competence (3), Emotional competence (4), Problem-solving skills (3)	97
Acquired awarenesses	Postures and qualities of teacher-researchers (22), Professional complexity (14), Utility of professional competences (2), Interdisciplinarity (4), Recognising or incarnating the teacher-researcher (6), Learning and developing skills (5), Commitment or passion for the profession (3), Meaning of being teachers (9), Personal and professional growth (10), Role of emotions or emotional experiences (3), Role of social media and multimedia potential (3), Strengths and weaknesses (7)	88
Actions favoured or strengthened by AaP	A. Operations on contentor experience: Identifying or focusing on elements of the teacher-researcher (48), Organising, clarity (13), Simplifying, synthesising, and selecting (19), Reflecting and connecting (9), Consolidating, fixing, deepening or elaborating (13), Internalising, personalising or transforming (6), Conveying meanings or communicating (7), Nurturing curiosity (2)	A: 117
	B. Operations of the process: Taking risks or putting oneself to the test (21), Experimenting with digital or communication methods (11), Designing (3), Polishing the product (3), Encouraging creativity and originality (7), Continuous learning (2), Deliberating	B: 48
	C. Operations on the self: Connecting personal self to the teacher-researcher (24), Bringing out the hidden or implicit (6), Cultivating, exercising or adopting a reflective attitude or reflecting (11), Valuing oneself (6), Facing one's limits (5), Engaging in epoché (2), Analysing or questioning actions (4), Reconstructing the path (29), Taking quiet time (3), Striving for the best of oneself (4), Self-assessment (5), Narrating, knowing or listening to oneself (5)	C: 104
The teacher I will be	Embracing novelty or openness to the unknown (4), Learning (3), Attending to needs (2), Using AaP and diary (3), Facing challenges (2), Acting consciously (2), Improving, and changing (6), Being competent (2), Quality communication (3), Time for reflection (4), Being a teacher-researcher (7)	38

Matured values. In this category, the students' comments focused on elements derived from deep reflections and accumulated experience that they found essential for their personal and professional growth. Creating the multimedia representations helped them recognise the importance of various tools, processes and attitudes, which they saw as guidelines for their role as teacher-researchers. Reflection, highlighted by 103 students (60%), was viewed as a crucial educational practice, facilitated by tools such as keeping a reflective journal and undertaking the AaP activity. Research and the role of the teacher-researcher were seen as vital for creating quality learning environments. Digital technology, emphasised by 60 students (35%), was viewed as important for enhancing teaching and learning and was linked to the values of innovation and creativity.

Developed competencies. In this category, the students highlighted the competencies that they believed they had developed by creating the multimedia representations, including cognitive, emotional, social and practical skills. Most students reported enhanced reflective competence through deep self-reflection during the task. Heuristic competence was also frequently mentioned, as the students explored and followed research steps. A total of 21 students (12.3%) reported greater digital competence and confidence in using new digital tools. The students also developed communicative, disciplinary, design, evaluative and emotional competencies and recognised the task's role in language refinement, discipline knowledge, planning, feedback skills and emotional management.

Acquired awareness. This category included statements related to the awareness that the students believed they had gained by creating the multimedia representations. Awareness referred to a deep understanding of personal traits or the teaching profession. The students primarily gained insight into the posture and qualities of the teacher-researcher, with some explicitly stating that they had come to embody this role. Teaching was described as a mission, life choice or destiny, reflecting a deep personal investment and dedication to the transformative power of education.

The students also acknowledged the complexity of the teacher-researcher's role, emphasising its interdisciplinary nature and need for balance, as illustrated by the aphorism "Everything matters" (2.73a). They also expressed an awareness of personal and professional growth, recognising their strengths, weaknesses and skill development. Moreover, they viewed the multimedia representations as a means of exploring the communicative potential of digital platforms, with one participant describing the experience as a chance to "show myself with an open heart" (2.7c), highlighting the activity's power to open new horizons and help the students share personal information and intimate elements.

Actions favoured or strengthened by AaP. This macro-category encompassed three subcategories of actions that the students took before, during and after creating the multimedia representations: (a) contents and experiences, (b) the process and (c) the (personal and professional) self. Regarding contents and experiences, the students primarily focused on manipulating them, with key actions including identifying essential characteristics of the teacher-researcher (48), simplifying and personalising contents (25), consolidating contents (13) and exploring connections between theory and practice (9). Regarding process-related actions, the students highlighted experimenting with technology, continuous learning, educational design processes, unleashing creativit, and – most importantly – testing their own capabilities (90). In terms of self-related actions, the students mentioned connecting their personal identities with the teacher-researcher's role (24), valuing overlooked aspects of themselves, self-assessing for improvement and practising deep reflection. They explored their inner selves, identified implicit assumptions and engaged in self-awareness. Moreover, 29 students (17%) appreciated the AaP for helping them reconstruct their journeys and offering insights into their past, present and future selves. One student powerfully captured this insight by stating, "This work enlightens my path" (2.57f).

The teacher I will be. This category comprised the full set of prospects envisioned by the students. A total of 38 students (22.2%) articulated their desires and aspirations for the near and distant future, including making professional commitments, envisioning possibilities of professional development and acknowledging their responsibilities as prospective educators. Some students declared their aim to embrace novelty, welcoming the unforeseen and viewing each moment as an opportunity for personal

growth and for the benefit of children and society at large. Others expressed their commitment to ongoing learning, growth and adaptability to contextual needs, pledging to act with vigilance and conscientiousness. Two participants (1.2%) articulated their determination to confront challenges positively (2.27b, 2.69d). Others expressed their aspiration to develop competencies, allocate time for reflection and prioritise quality communication, acknowledging its pivotal role in educational settings. Given the usefulness of AaP and reflective journals, they would find it beneficial to propose similar activities in future professional development programmes to enrich their personal and professional experience and profile. Overall, the students shared the aspiration to effectively fulfil the role of teacher-researcher.

Influence of multimedia technologies on performing the AaP task

From the analysis of the answers to the question "Do you think the hypothetical prospect of publishing your representation online influenced its creation?", eight categories emerged, as illustrated in Table 6. Each category concerned a specific element reflected upon or implemented by the students before, during and after the creation of the multimedia representations.

Table 6
Coding of the influence of multimedia technologies on performing the AaP task

Categories	Labels	No. of labels
The prospect of publishing online	Complete influence on format (96), Partial influence on format (22), No influence on format (53)	171
Representation choices	Use of voice, orality, audio (8), Use of images, photos, schemes, lists (19), Use of keywords (12), Use of roles, Use of music, sounds (10), Use of animations (2), Use of explanations or example (8), Use of interactive means (7), Use of personal elements (9), Use of symbolic elements (14), Use of different languages, stimuli (6), Use of multimedia language (5), Use of short, simple, clear sentences (3), Non-disclosure or omission of personal elements (6), Limited visibility (3), Respect for privacy (13)	126
Qualities of the representations	Clear, simple and technical communication (19), Clarity (16), Exhaustiveness (4), Immediacy (9), Brevity (18)	66
Representation processes	Continuous revision (23), Finding a purpose (2), Omitting or focusing on some aspects (5), Synthesising (4), Selecting language (11), Selecting content (36), Selecting graphics or platform (9), Digital research and training (2), Exploring different representation methods (3), Making video captivating or engaging (27), Putting oneself in others' shoes (3), Leaving room for interpretation (2), Reflecting on message to be communicated (5), Starting from personal experience (2), Considering the recipient (7), Self-assessment of the product (4), Being guided by social media (5)	150
Goals of the representations	Being useful for others (13), Sharing (4), Creating spaces for reflection (8), Surprising the reader (2), Including (3), Conveying complexity or qualities of the teacher-researcher (7), Making the topic understandable (10), Expressing one's point of view and persona (3), Presenting oneself (5)	55
Perceptions of the representations	Fear of disclosure (3), Shyness in public display (2), Fear of others' judgement (2), Concern about others' misunderstanding (4), Embarrassment (5), Obstacle in sharing personal information (4), Time as a limitation (6), Inability to receive feedback from others (2), Complex task (5), Involvement (3), Pride and satisfaction (8), Interesting (4), Time for fun (3), Challenging and novel task (21), Sense of confidence (3), Sense of contentment (4), Sense of freedom of expression (7), Writing delves more deeply (2)	88

The prospect of publishing online. This category comprised positive, negative or neutral comments about the influence of the prospect of publishing the multimedia representations online on how the task was performed. A total of 105 students (61.4%) stated that they had felt the effect of this prospect and that this influenced their creations in various ways and intensities. A total of 64 students (37.4%) stated that they had not been influenced by this prospect and that their creations would have been the same even if they had been shared only with their classmates or lecturers. A total of 27 students (15.8%) stated that they were partly influenced. In terms of content, format and personal disposition, the creations were conceived and realised differently because of the online element. Two students (1.2%) stated that they had not been aware of the influence of this prospect until they deeply reflected on the related processes based on the meanings of the multimedia representations noted in their journals.

Representation choices. The students recognised that they had made specific choices for their creations. It was mostly technical choices that helped them best express themselves as people and teacher-researchers digitally. They used elements such as voice, music, keywords, images, photographs and animations, which they considered typical of multimedia language and socially effective for a wide audience. They also employed personal and symbolic references by inserting parts of their lives that mixed the worlds of study, work and leisure. Symbolic elements seemed to be appropriate for giving the creations an interpretative tone, clarity and communicative power. The students believed that such elements could help viewers better understand who they were and what they wished to express. In contrast, some students opted not to show themselves and to omit private elements. Thus, privacy concerns were another influencing factor. Another crucial factor was the decision to use multiple means of communication, for example different social media. This choice can be linked to the aims of being inclusive of all kinds of communities and creating a complete, dynamic and interactive representation that aligns with the diverse communication modes found on the web.

Qualities of the representations. This category encompassed the qualities that the students looked for when creating their multimedia representations and considering the possible viewers. The participants tried to achieve simple, clear and technical communication from an educational point of view. A total of 37 students (21.6%) stated that they tried to employ a professional language that was at the same time understandable to a wide audience, even to people not specialising in educational research. The students used specific terms from the field but supported them with images and brief explanations using simpler terms. Many students also aimed for brevity (often associated with clarity, immediacy and exhaustiveness). A total of 29 students (17%) stated that brevity was essential for effectively communicating their messages to a wide audience. This was based on the view, sometimes stemming from studies or subjective experiences, that viewers on social media have a short attention span; thus, information should be provided in an attractive way in a few seconds or minutes. In this case, the students' choices were guided by the consideration of the prospective viewership and their wish to make their creations easily but deeply comprehensible. The search for such qualities involved various processes and actions that affected the students' learning.

Representation processes. This category encompassed the processes involved in the creation of the multimedia representations. A total of 19 students (11.1%) reported having engaged in iterative revision, meticulously refining aspects such as duration, language and coherence to align with both personal objectives and audience preferences. Simultaneously, they conducted self-evaluations to ensure fidelity to content while catering to audience expectations. Synthesis emerged as another critical process, which involved the distillation of vast knowledge into concise, impactful presentations. This was complemented by meticulous content selection aimed at meeting audience expectations and competencies. Central to these efforts was the aim of creating captivating presentations driven by considerations of audience reception and digital communication dynamics. The students leveraged various modes of presentation (the most frequently used programmes were Microsoft PowerPoint and Canva), drawing on their digital proficiency to create compelling representations. Some students adopted an empathetic stance, aligning content with audience perspectives and social media trends. These processes underscored a conscious approach to self-expression and audience engagement. The students prioritised representations that

would resonate with online audiences, demonstrating proficiency in digital communication and innovative presentation strategies.

Goals of the representations. This category included the entire repertoire of comments about the aims of the multimedia representations. The students cited multiple objectives that justified their choices and processes. The overarching aim was to engage in an exchange between them, the content and the public with different possibilities of interaction. The most prominent objectives were to be useful to others (13), to explain the complexity of being a teacher-researcher (11), to make people understand the topic (10), to create a space for reflection (8), to introduce themselves (5) and to express personal points of view (3). The creations could stimulate some reflection or sow the seeds of change in the daily teaching activities of other teachers, instilling in them reflective and investigative suggestions aimed at improving their own professional practices. In the multimedia representations, the students found the opportunity to be personally, professionally and socially meaningful. They believe that becoming a teacher-researcher has the potential to bring about innovation in teaching and research practices.

Perceptions of the representations. This category included the students' perceptions of the multimedia representations. Some feelings of embarrassment, fear and worry related to the prospect of publishing the representations online emerged. Specifically, they were related to sharing confidential information with a wide audience, the possibility of being judged rather than understood and the difficulty of obtaining feedback to reformulate their creations. Also, duration was perceived as a limiting factor because the students "had to condense everything into a few minutes of video" (1.4e). Three students (1.75%) stated that creating a multimedia representation was a complex task.

Negative feelings alternated with positive judgements of the task itself and the work done. The students found the task original, interesting, engaging and challenging. They saw it as an opportunity to have fun, to show oneself and express one's ideas, to overcome shyness and insecurity, to challenge oneself and to do one's best. Many students expressed pride in and satisfaction with the results of their creations, confidence in the tools used and in themselves, enjoyment and a sense of freedom to express themselves. They felt free to share aspects of their being that fit the description of themselves as teacher-researchers. One student (0.6%) emphasised that combining the multimedia representation with writing deepened the topic of the task.

Discussion

Considering the first research question, the results show that students believed that they had mainly developed heuristic and reflective skills, which they viewed as essential for establishing good educational relationships and effective middle management processes in terms, for example, of problem-solving and decision-making approach. Somewhat surprisingly, the students made no explicit reference to disciplinary or methodological skills. There may be two reasons for this. First, students focus on these skills in the early years of their education, since they are considered essential for elementary education teachers. Second, the development of the teacher-researcher's posture requires a specific focus on heuristic and reflective skills to continuously improve the quality of teaching. Thus, heuristic and reflective skills can be considered a set of transversal competencies, the development of which also enhances other competencies of the teaching profession.

Regarding the second research question, the results indicate that the students obtained significant personal and professional gains from the creation of the multimedia representations. Overall, the pre-service teachers achieved significant values, competencies, processes and awareness, which facilitated continuous growth and success in their educational endeavours. Through AaP, they had the opportunity to formulate self-feedback that was useful not only for assessing the learning milestones reached in constructing the teacher-researcher profile but also for reflecting on aspects that required further exploration. This strategy allowed them to sow the seeds of lifelong learning. From this perspective, the task can be viewed as a sustainable learning strategy; that is, an assessment that promotes self-regulated learning through the formulation of evaluative judgements (Boud & Soler, 2016). As Yan and Boud (2022,

p. 15) emphasised, "after graduation, students need to be capable of continuing learning and making informed decisions based on their evaluative judgment of the quality of their own work and that of other". Supporting such skills is also particularly important for facilitating the transition of students from pre-service to in-service teachers, which is characterised by a high attrition rate in the early years of a teacher's careers (Wang et al., 2008). In a continuously evolving and increasingly complex context, the students were able to identify and employ strategies for continuously and dynamically adapting to changes, reflecting on their practices, adopting new pedagogical strategies and developing critical thinking and problem-solving skills.

Considering the third research question, the findings show that the prospect of publishing the multimedia representations online influenced 56% of the students' creations (96 students) by affecting technical and personal choices. The desired qualities included digital communication norms. Processes included revision, synthesis and selection. Goals ranged from sharing experiences to fostering reflection. Perceptions varied, with students reporting that the task was challenging yet rewarding, facilitated self-expression and growth and complemented written reflection. AaP is an effective means of performing authentic tasks akin to real-life activities (Herrington & Oliver, 2000). Authentic assessment tasks not only enhance students' motivation and engagement but also provide opportunities to cope with real-life complexities that are conducive to student development (e.g., Villarroel et al., 2018). For pre-service and in-service teachers, being able to effectively communicate this posture on social media is a particularly valuable skill in the digital age. Based on Magana's (2017) translational, transformational, transcendent framework, a model for understanding how to transition from the passive use of technology in education to progressively active, transformative and transcendent use, it can be said that the AaP task used in this study may have transformative potential. This is the main added value of this assessment experience in a higher education context. Digital technologies can be used to support students' meta-learning, facilitating a shift from simple memorisation to active knowledge generation. The experience of the specific task aligned with the Contribution level, as the students not only created but could also potentially share their multimedia representations with a real audience. In this sense, technology enabled them to actively contribute to knowledge of the teacher-researcher's profile and to engage thoughtfully with educational communities.

Conclusion

This study has two main limitations. From a methodological perspective, because the study was conducted in a single study context, the results cannot be considered generalisable to other contexts despite their relevance and pioneering elements that warrant further investigation. Even though the results are context dependent, this paper has provided detailed descriptions of the educational environment and practices to enable educators to determine whether the findings may be applicable to their own contexts and whether the experience under study can be transferred to other educational settings.

From the perspective of assessment design, the multimedia representations may have had two limitations. First, they were subject to social desirability bias. Since the authentic task was subject to assessment by the instructor, the students may not have been entirely honest about which elements of the teacher-researcher posture they actually internalised, preferring to include ideal characteristics in their representations. This could be counterbalanced by discouraging simply paraphrasing study texts and encouraging metaphorical thinking that involves an interpretive process based on personal experiences. Related to this is the second limitation: Metaphorical thinking requires time and effort, and not all students may perceive such an investment of resources as worthwhile. This could be addressed by suggesting that students use artificial intelligence tools to construct multimedia elements, starting with important suggestions drawn from reflective journals.

In conclusion, this study analysed and documented the value of AaP for pre-service teachers, who may leverage educational technologies to facilitate students' active learning and self-assessment. The use of multimedia tools allowed the students to elaborate a self-representation as teacher-researchers, thereby

creating a bridge between theoretical learning and the real professional world. Furthermore, given the utility of AaP as a strategy for hetero- and self-assessment at the end of a professionalising university course, and given that from the multimedia representations emerged a perception of the specific professional profile, policymakers (e.g., faculty developers) may consider including this strategy in other professionalising courses. Lastly, as school administrators are responsible for fostering an environment that supports teaching and learning innovation, continuous professional growth and reflective practices among teachers, it may be beneficial to establish a network of teacher-researchers and to highlight the importance of this professional profile within educational communities.

Considering the era in which we live, this study prompts questions and points to new avenues for future research. Specifically, future studies could investigate how digital tools can provide new teaching and learning opportunities, particularly in the realm of assessment. From a theoretical perspective, the experience examined in this study highlights the teacher-researcher's potential to cope with the increasing pedagogical and didactic complexities that characterise contemporary learning environments. To this end, emphasis should be placed on supporting both pre-service and in-service teachers in acquiring specific competencies and developing an awareness of this role. This consideration raises a question that can be addressed in future research: How can technology be leveraged, possibly in a transcendent manner, as proposed by Magana (2017), to support students in engaging in self-directed inquiry? This includes using technology as a tool for exploration, critical thinking and problem-solving and as a means of applying acquired knowledge to addressing real-world issues and creating a positive social impact.

Author contributions

Author 1: Conceptualisation, Investigation, Writing – original draft, Writing – review and editing; **Author 2**: Data curation, Formal analysis, Writing – original draft, Writing – review and editing.

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