Body and Subject under the Technological Gaze: A Subjectification-Centered Critique of AI-Assisted Dance Education

Luwei Liu

Sichuan Normal University, Chengdu, Sichuan, China

Abstract

This paper conceptually examines how the integration of artificial intelligence (AI) into dance education may reshape the social, affective, and ethical conditions of teaching and learning, and what these structural changes may imply for learners' subjectification. Drawing on Biesta's (2009, 2017, 2020) framework of the three educational functions—qualification, socialization, and subjectification—the paper develops a theoretical lens through which two common assumptions in contemporary AI-in-education discourse are critically examined: (a) that AI-enabled personalization inherently supports subjectification, and (b) that gains in instructional efficiency produced by algorithmic feedback are pedagogically neutral. Through a deductive analysis of existing empirical and conceptual literature in educational technology, the paper argues that AI-assisted dance instruction operates alongside two interconnected structural shifts. The first concerns the weakening of bodily co-presence and the accompanying erosion of relational and affective conditions that support the formation of subjectivity. The second involves a redistribution of evaluative authority from situated human judgment toward algorithmic standards that are themselves embedded with cultural and aesthetic assumptions. The paper contends that, unless guided by an explicit pedagogical commitment to subjectification, the integration of AI may strengthen the qualification function of dance education at the expense of its subjectifying purpose. As a conceptual response rather than an empirical solution, two pedagogical orientations are proposed for illustration: co-perceptive feedback and culturally grounded narrative practice. The contribution of this study is primarily theoretical. Before meaningful empirical investigations of AI in dance education can be undertaken, the conceptual foundations and potential risks associated with its integration require clearer articulation.

Keywords

Artificial Intelligence; Dance Education; Subjectification; Biesta; Educational Technology Critique; Algorithmic Mediation.

1. Introduction

Artificial intelligence (AI) is moving rapidly into areas of education that were once thought to be relatively insulated from it—areas whose work depends on the body, on relationships between people, and on practices rooted in particular cultures. Dance education is one of them. For a long time, teaching dance has rested on co-presence, demonstration, embodied imitation, and the kind of judgment a teacher builds up over years of work (Smith-Autard, 2002; Risner, 2010). That picture is now changing. Motion-capture systems, AI-driven feedback tools, generative choreography models, and immersive virtual environments are all reshaping how dance is taught (Wang, 2024; Xu et al., 2025; Kang et al., 2023).

Much of the existing literature concentrates on the precise recognition and correction of movement. This work uses motion capture to correct students' postures and to deliver

individualized guidance and immediate feedback, with the aim of making instruction more efficient; another line of research builds complete teaching systems in which AI acts as a virtual instructor, taking on the tasks of correcting movement and tailoring guidance to each learner (Iqbal & Sidhu, 2022; Hendry et al., 2020). Across these studies, AI is largely positioned as a tool for providing feedback. Beneath this picture, however, a question has not been asked closely enough: once AI enters the classroom, what exactly does it change about the teaching situation itself? Do the relationships between teacher and student, the emotional connections among teachers and peers, and the way evaluation gets made all shift as a result? And if they do, might those shifts in turn bear on the deeper purposes that education is meant to serve? Put differently, AI reshapes the relationships that make up a classroom—and the question is whether those reshaped relationships may ultimately unsettle the purposes of education themselves.

It is out of this concern that the paper turns to Gert Biesta's (2009, 2017, 2020) account of the three purposes of education to examine what happens when AI enters the dance classroom. These three purposes are qualification, socialization, and subjectification.

The argument of this paper is the following. In how AI is currently being brought into dance education, one tendency stands out: it strengthens the function of qualification. Because these applications direct so much attention toward the accurate reproduction of movement, they place a quiet pressure on subjectification—on the learner's growth as an individual subject. A tension therefore emerges among qualification, socialization, and subjectification once AI takes a place in the dance classroom. Without a clear sense of educational purpose to guide it, the classroom can be pulled along by the technology—which is the risk Biesta (2017) points to. Movement grows ever more precise under technical guidance, while the affective, ethical, and relational dimensions of learning risk being pushed to the margins.

This paper proceeds in four steps. Section Two sets out the scope of the analysis and the theoretical approach it adopts. Section Three develops the first argument: that AI-mediated dance instruction reconfigures the social and affective conditions on which subject formation depends. Section Four develops the second: that algorithmic assessment redistributes pedagogical authority in ways that carry cultural and aesthetic bias. Section Five outlines two pedagogical orientations—co-perceptive feedback and culturally grounded narrative practice—as illustrative directions for integrating AI while keeping a commitment to subjectification. The paper closes by placing these arguments within the wider question of what role AI should play in dance education.

2. Approach and Scope

This is a conceptual paper (Jaakkola, 2020). AI entering dance education is still very new, and before anyone can design empirical studies worth doing, a few theoretical questions need to be sorted out first: what AI actually touches in the classroom, and what those changes mean. That sorting-out is what this paper sets out to do. In a field where the technology moves faster than our thinking about it, this kind of groundwork is needed (Selwyn, 2016; Williamson, 2017).

The paper works deductively. It takes Biesta's theory of educational purpose as its frame and uses it to look at one question: once AI comes into the dance classroom, what happens to the relationships that classroom is made of? Where a point needs factual backing,this paper draws on existing empirical and conceptual studies—AI systems, for instance, do not handle different dance styles equally well, and learners respond to algorithmic feedback in different ways—but this is not a literature review. The studies are cited to support the argument, not to survey the field.

The scope is limited in three ways. First, the focus is on the dance classroom in formal education—on what happens to the teacher–student relationship, to emotional connection, and to how evaluation is made once AI enters, and on the educational purposes these changes bring to the surface. Recreational and informal dance activities are left aside. Second, by AI this paper means systems with machine-learning capability: pose estimation, movement recognition, generative models, and large language models. Third, the paper takes a critical position on all of this. AI does carry a risk of getting in the way of subjectification. More precisely, while it strengthens qualification, it sits in tension with socialization and subjectification: the more a classroom is pushed toward hitting precise movement targets, the less room is left for a learner to form as an individual and to find a voice of their own. Section Five turns to the practical side of teaching and asks what can still be done under that tension.

3. AI Mediation and the Social and Affective Conditions of Subject Formation

3.1. Co-presence as a Relational Foundation for Subjectification

Dance has always been taught in bodily co-presence. Teacher and students share the same room and the same time, and teaching moves through demonstration, imitation, corrections passed on by a gesture or a glance, and the syncing of movement to rhythm (Smith-Autard, 2002). A teacher presses down on a shoulder or signals with a look to take it from the top—none of this works without being there together. Co-presence is not a backdrop you could remove; it is one of the conditions that lets dance teaching happen at all.

Education, as Biesta (2017) puts it, is relational at its core. A teacher's task is not only to pass on knowledge and skills but to address the student as someone who might become a subject—able to respond, to judge, and to act on their own. Subjectification rests not just on what is taught, but on the encounter in which the teaching takes place.

Once AI enters, this arrangement shifts. Some systems use pose estimation to track the body in real time, checking whether the spine is aligned and the feet and arms have landed where they should, then returning part-by-part corrections (Sun et al., 2026); others generate a sequence from a student's uploaded music, demonstrated by a digital avatar to imitate and revise (Ma, 2025); still others turn AI into a tutoring agent that handles correction and individualized guidance (Kang et al., 2023). A third party has slipped into what used to be a teacher–student pair: the algorithm—and often it is the one that responds fastest. The teacher is no longer the only source of feedback, sometimes not even the main one, especially in asynchronous and remote settings where the teacher may not be present in the moment the learning happens.

What matters is not efficiency but that the relational ground beneath subjectification has loosened. Biesta (2020) is clear: subjectification happens when a learner is addressed by an "other" and called to respond within a relationship that carries normative weight. However fast and precise an algorithm is, it does not address the learner in that sense—it measures how closely a movement matches a predefined model, responding to a string of indicators rather than to a person in the making. Once that difference is overlooked, the student is easily placed as an object to be optimized rather than someone becoming who they are.

3.2. The Attenuation of Affective Conditions

The affective side is reshaped just as much. In a conventional classroom, emotional support travels mostly without words: an encouraging look, the something-hard-to-name carried inside a demonstration, the resonance of bodies moving together (Risner, 2010). These exchanges hold up what Biesta (2017, p. 81) calls the existential register of education—the

dimension in which a student is seen as a person, not merely as someone executing a movement.

AI feedback translates this affective layer into information: visualized curves, a few scores, error blocks marked in red, a line of text naming the body part that was off. This is not all bad. Research shows that some students—especially those who feel shy or self-conscious face to face—find that practicing in front of a screen carries less of the pressure of being watched, and lets them work more freely (Kang et al., 2023).

But scholarship on educational technology has voiced the opposite worry: overreliance on adaptive feedback may wear down a learner's self-regulation and emotional resilience (Selwyn, 2016; Ecclestone & Hayes, 2008). In dance this deserves particular attention. When a student practices with eyes fixed on the gap between their movement and the standard model, the focus slides easily from "what am I trying to express" toward "where am I still falling short." The concern is less whether AI feedback feels cold, and more that it may quietly crowd out the room in which being-seen can happen between people. As algorithmic feedback becomes what students lean on most, the relational and affective dimensions subjectification depends on slip into the background—not because AI does away with emotion, but because the time and attention once given to people recognizing one another get steadily compressed, and with them the room a dancer needs to take shape as a subject.

4. Algorithmic Assessment, Pedagogical Authority, and Embedded Cultural Bias

4.1. The Technological Gaze and the Datafication of the Dancing Body

In AI-supported dance teaching, the body has to become something a machine can read first. A movement is caught by the camera, cut into segments, encoded, and matched against a model trained beforehand (Wang, 2024; Xu et al., 2025). Seen from an educational angle, this step is neither neutral nor a small matter. It pushes a step further what Foucault (1977) called the disciplined body, and what later critical scholars called the datafied body (Selwyn, 2016; Williamson, 2017): the dancer becomes something to be watched and scored without pause. So the person dancing holds two positions at once—a performer of movement, and a set of data.

Through Biesta's framework, this datafication also quietly shifts who gets to decide. The judging used to be the teacher's, grounded in what they saw on the spot and read through a cultural understanding; now that judgment is handed more and more to the algorithm, whose standards were written into its training data and its architecture long before. The student is no longer watched mainly under a teacher's gaze—the kind that catches hesitation, reads a deliberate departure, tells trying-something-out from expressing-something. In its place is a gaze fixed on one thing: how far you are from the standard model.

4.2. Cultural and Aesthetic Biases Embedded in Algorithmic Standards

The criteria an AI dance system scores by are never value-free. They depend on the data fed in during development, and on the choreographic conventions taken for granted behind that data. Existing research has found that these systems perform very unevenly across traditions: a system trained mostly on ballet, contemporary dance, or commercially dominant forms tends to falter the moment it meets classical Indian dance, African traditional dance, or local folk practices—because the movement vocabularies, the orientation and weighting of the body, and the rhythmic structures are simply not the same thing (Ma, 2025; Adalarasu et al., 2025). It shows most plainly in improvisation and free movement: once the movement turns irregular, the system's reading starts to slip.

This limitation should not be read as a passing technical problem that more data will fix. It is structural to supervised learning: the ruler a system measures movement by grows out of its training corpus, and that corpus reflects an existing distribution of cultural prestige, institutional investment, and digital visibility—whoever gets recorded in volume and studied repeatedly is the one more likely to become "the standard." When such a system enters the dance classroom as assessor or feedback-giver, it can produce a kind of aesthetic convergence (Williamson, 2017): styles and bodies close to the dominant template get rewarded, those further from it get pushed to the edge.

The implications for the subjectification function of dance education are not small. For Biesta, subjectification is about the learner emerging as a singular person, able to take up a position of their own in the world. It needs room for each individual to grow a recognizable style, a voice, a way of moving that is genuinely theirs. But if the evaluative environment keeps rewarding closeness to one narrow aesthetic standard, the room needed for that self-formation narrows. The real risk, then, is not that AI necessarily blocks subjectification, but that for learners whose movement falls outside the algorithm's training distribution, it makes subjectification harder.

4.3. The Redistribution of Responsibility

A further consequence concerns the allocation of pedagogical responsibility. As AI systems increasingly participate in evaluative processes, it becomes less clear who should be held accountable for assessment decisions and their consequences. If an algorithmic feedback system encourages movement patterns that increase the risk of physical injury, or if it consistently devalues movement vocabularies rooted in particular cultural traditions, where does responsibility lie? Does it rest with the teacher who adopted the system, the developers who designed it, or the institution that authorized its use? Existing theoretical frameworks on AI in education provide no definitive answer to this question (Selwyn, 2016; Williamson, 2017).

From Biesta's perspective, this diffusion of responsibility is not merely a matter of governance or administration. It touches the ethical foundations of teaching itself. As Biesta (2017) argues, teaching entails an irreducible responsibility for the *educational encounter*. Once this responsibility is transferred to systems whose internal operations remain opaque—even to those who deploy them—the ethical structure of pedagogical practice is weakened. The issue is therefore not only whether AI can make assessment more efficient, but whether the redistribution of authority and responsibility alters what it means to teach and to be taught in the first place.

5. Pedagogical Orientations: Toward AI Integration that Supports Subjectification

The critique in the preceding sections is a conditional one. AI may well bring the risks described above, but it can also be put to use as a tool. What matters is that the main responsibility for the classroom stays with the teacher, while AI comes in as a supporting condition—the two working together toward the cultivation of the student's subjectification. Along these lines, this section sets out two directions. They are directions of thought, not finished instructional models; how they play out in practice, and how well, is for later research to test.

5.1. Co-Perceptive Feedback

Rather than letting AI be the evaluator that scores students and hands down judgments, it is better to put it back into a three-way structure as one source of perception among others. In

that structure, the data AI produces, the student's own reflection, and the teacher's reading are deliberately placed together in dialogue.

One point matters here. The standard an algorithm uses to read movement should not come only from a single, dominant aesthetic; it should also take in the aesthetic standards of one's own nation and culture as a basis for interpretation. Read this way, the algorithm's output is no longer a final verdict but material the group interprets together. The point is not to replace human perception with machine analysis, but to use AI to let teacher and student see more than they usually would. A student practicing with AI feedback might keep a reflective journal alongside it, writing down what the data says next to what the body actually felt; or a teacher might lead the group in going back over a stretch of AI data, discussing what it caught and what it missed. In the end, it comes down to meeting AI with an open mind—treating it as a source that lets people gain more information, not an authority that decides for them. On the technical side, the design has to match: AI outputs should be kept as description rather than instruction—telling you what the movement was like, not ordering you how to change it.

5.2. Culturally Grounded Narrative Practice

The second direction is to put dance learning back into the cultural narratives and traditions it belongs to. This can offset, at least in part, the aesthetic and cultural biases built into AI assessment.

A dance should not be drilled as a set of technical movements alone; behind it lie origins, community meaning, and ritual weight. Students can make something narrative around the dance they perform—a dance vlog, a recorded oral history, a small ethnographic film—documenting and telling the cultural meaning carried inside the movement. Immersive technology has a place here too: not dropping the learner into a training environment emptied of context, but setting the dance back into the cultural scene it grew out of. None of this is about adding "a bit of cultural flavoring" to technical training. In the end, aesthetic sense is something cultivated through real observation and bodily experience—digital tools can neither measure it nor pass it on in full. What this direction tries to protect is dance as a culturally rooted form of self-formation: so that the way a student comes to move stays connected to a larger history, identity, and community, rather than hanging in the air.

6. Conclusion and Contribution

The argument of this article is this: once AI enters dance education, qualification and socialization are reinforced, while subjectification is somewhat suppressed—and a subtle tension takes shape among the three.

Around this point, the article has pursued two main lines. First, the entry of AI reshapes the relationships in the dance classroom—the social bonds, the affective ties, and the ethical sense that runs through them. Second, it redistributes pedagogical authority within the classroom. In response to this twofold tension, the article puts forward two pedagogical directions: co-perceptive feedback, and culturally grounded narrative practice.

The contribution of this article lies in taking Biesta's framework of educational purpose as a lens for examining the purposes dance education itself pursues: what becomes of those purposes once AI enters the classroom, what effects may follow, and what, in educational terms, truly matters. Put differently, what this article seeks to clarify is the question of which educational purposes we should measure these classroom AI applications against.

References

[1] Adalarasu, K., Chetty, R. K., Begum, K. G., Harini, S., & Janardanan, M. (2025). An explainable machine learning (XAI) framework for classifying complex dance postures of Indian

Bharatanatyam dancers. *Applied Soft Computing*, 171, 112817. https://doi.org/10.1016/ j.asoc. 2025. 112817.

[2] Biesta, G. (2009). Good education in an age of measurement: On the need to reconnect with the question of purpose in education. *Educational Assessment, Evaluation and Accountability*, 21(1), 33–46. https://doi.org/10.1007/s11092-008-9064-9.

[3] Biesta, G. (2017). *The rediscovery of teaching*. Routledge.

[4] Biesta, G. (2020). Risking ourselves in education: Qualification, socialization, and subjectification revisited. *Educational Theory*, 70(1), 89–104. https://doi.org/10.1111/edth.12411.

[5] Ecclestone, K., & Hayes, D. (2008). *The dangerous rise of therapeutic education*. Routledge.

[6] Foucault, M. (1977). *Discipline and punish: The birth of the prison* (A. Sheridan, Trans.). Pantheon.

[7] Hendry, D., Chai, K., Campbell, A., Hopper, L., O'Sullivan, P., & Straker, L. (2020). Development of a human activity recognition system for ballet tasks. *Sports Medicine – Open*, 6(1), 10. https:// doi. org/10.1186/s40798-020-0237-5.

[8] Iqbal, J., & Sidhu, M. S. (2022). Acceptance of dance training system based on augmented reality and technology acceptance model (TAM). *Virtual Reality*, 26(1), 33–54. https://doi.org/ 10.1007/ s10055-021-00299-9.

[9] Jaakkola, E. (2020). Designing conceptual articles: Four approaches. *AMS Review*, 10(1–2), 18–26.

[10] Kang, J., Kang, C., Yoon, J., Ji, H., Li, T., Moon, H., Ko, M., & Han, J. (2023). Dancing on the inside: A qualitative study on online dance learning with teacher-AI cooperation. *Education and Information Technologies*, 28(9), 12111–12141. https://doi.org/10.1007/s10639-023-11649-0.

[11] Ma, Q. (2025). Harnessing generative neural networks to fuse traditional Tujia Baishou dance with contemporary choreography. *Acta Psychologica*, 257, 104826. https://doi.org/ 10.1016/j. actpsy. 2025. 104826.

[12] Risner, D. (2010). Dance education matters: Rebuilding postsecondary dance education for twenty-first century relevance and resonance. *Journal of Dance Education*, 10(4), 95–110.

[13] Smith-Autard, J. M. (2002). *The art of dance in education* (2nd ed.). Routledge.

[14] Selwyn, N. (2016). *Education and technology: Key issues and debates* (2nd ed.). Bloomsbury.

[15] Sun, R., Liu, Y., Li, H., & Ren, J. (2026). A study on the factors influencing user experience of AI pose recognition feedback systems in ballet-class contexts. *Applied Sciences*, 16(7), 3431. https:// doi. org/ 10.3390/app16073431.

[16] Wang, Z. (2024). Artificial intelligence in dance education: Using immersive technologies for teaching dance skills. *Technology in Society*, 77, 102579. https://doi.org/ 10.1016/ j. techsoc. 2024. 102579.

[17] Williamson, B. (2017). *Big data in education: The digital future of learning, policy and practice*. SAGE.

[18] Xu, L., et al. (2025). Effects of AI-assisted dance skills teaching evaluation and visual feedback on dance students' learning performance, motivation and self-efficacy. *International Journal of Human-Computer Studies*.