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17

Isolde Malmberg, Thade Buchborn, Lauren Steinmetz (Eds.)

Future-making, Mobility and Networking in Europe

Impulses for Music Education in School, Teacher Education and Professional Development

TEACHER EDUCATION ACADEMY FOR MUSIC

Future-Making, Mobility and Networking in Europe

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Table of Contents

Ruth Jakobi & Simone Dudt
Foreword **7**

Isolde Malmberg, Thade Buchborn & Lauren Steinmetz
Addressing Music Education Futures in Europe
Through Research and Development: An Introduction **11**

I. MUSIC EDUCATION AND FUTURE-MAKING

Philip Stade, Thade Buchborn, Jonė Girdzijauskaitė-Pocienė,
Anna Houmann, Elissavet Perakaki, Branka Rotar Pance,
Michael Rumpeltes, Lina Van Dooren & Lena Widdermann
Music Education for Future-making:
Integrating Sustainability, Democracy and Digitalisation
through Participatory Design-Based Research **21**

II. MOBILITY FOR MUSIC EDUCATION STUDENTS

Angeliki Triantafyllaki & Jens Knigge
Section Introduction **53**

Jens Knigge, Thomas De Baets, Natassa Economidou Stavrou, Solveig Fretheim,
Rūta Girdzijauskienė, Runa Hestad Jenssen, Kirsti Nørstebø & Lorraine O'Connell
Redesigning Mobility in European Music Teacher Education:
From Barriers to Opportunities **61**

Lauren Steinmetz, Isolde Malmberg, Smaragda Chrysostomou,
Stefanie Kreuzwieser, Angeliki Triantafyllaki, Demosthenes Dimitrakoulakos,
Verena Bons & Wilfried Aigner
Design-Based Research in an International,
Multilingual and Interprofessional Setting:
Facilitating School Internships Abroad
in European Music Teacher Education **79**

Isolde Malmberg, Angeliki Triantafyllaki & Demosthenes Dimitrakoulakos
Mentoring in Collaboration:
Co-constructing Music Education Competencies
in School Internships Abroad **109**

Lauren Steinmetz & Smaragda Chrysostomou
Crossing Borders, Shaping Professional Selves:
Preservice Music Teachers in School Internships Abroad **129**

Runa Hestad Jenssen & Lauren Steinmetz
Designing for Leaks:
An Outro in Movement **151**

III. MUSIC EDUCATION IN EUROPE: MAPPING THE FIELD

Natassa Economidou Stavrou, Smaragda Chrysostomou, Angeliki Triantafyllaki, Elissavet Perakaki & Thekla Andreou
Mapping Music Teacher Education in Europe:
From Design to Implementation **161**

Rūta Girdzijauskienė, Lorraine O'Connell & Karla Stolle
Mapping the Present and Shaping the Future:
Insights on School Music Education in Europe **187**

IV. ADVOCATING FOR MUSIC EDUCATION IN EUROPE

Thomas De Baets, Ann-Sophie De Praitere, Marina Gall & Isolde Malmberg
The *TEAM* Learning Outcomes for Music Teacher Education
in Europe **209**

Isolde Malmberg, Marina Gall, Michaela Hahn & Finn Schumacker
Advocating for Music Education:
Strategies to Sustain Music in General Schools
and in the Wider Music Education Sector **227**

APPENDIX A–H

I. WORK PACKAGE 5
SCHOOL INTERNSHIPS ABROAD AND MENTORING

A: Design Principles for School Internships Abroad & Mentoring **247**

B: Introductory Conversation Guide **251**

C: Cultural Reflection Tree **255**

D: Voice Memo Prompts **257**

E: Photo Journal Prompts **259**

F: Debrief Conversation Guide **261**

G: Checklist for Language-Sensitive Music Teaching **263**

II. WORK PACKAGE 8
MAPPING MUSIC EDUCATION IN SCHOOLS

H: Music Lessons in European Schools **267**

The Editors **273**
The Authors **274**

Philip Stade, Thade Buchborn,
Jonė Girdzijauskaitė-Pocienė, Anna Houmann,
Elissavet Perakaki, Branka Rotar Pance, Michael Rumpeltes,
Lina Van Dooren & Lena Widdermann

Music Education for Future-making

Integrating Sustainability, Democracy and Digitalisation through Participatory Design-Based Research

Abstract

In current EU policy papers, the key issues of sustainability, democracy education and digitalisation are linked together to serve a coherent strategy. However, in competence frameworks for education, the close connection between these future-oriented topics gets lost. Therefore, educators are faced with the challenge of relating sustainability, democracy education and digitalisation to one another when developing learning opportunities for practical application. In this chapter, we describe the design process and results of *TEAM's Work Package 3 Music Education and Future-making*. In a participatory Design-Based Research process seven learning offers for school music education, music teacher education and continuous teacher education were designed and tested in music educational practices across Europe and published open access on the collaborative platform *Open Music Academy*. Key design principles were *integration*; *participation*; *flexibility*; *creativity and criticality* as well as *open access and collaboration*. Educators are invited to adapt, apply, implement and co-design the materials and concepts for their local music learning and teaching context.

Keywords: music education, sustainability, democracy education, digitalisation, design-based research

Introduction

In times of rapid and fundamental global change, music education must not only enable learners to adapt, but also empower them to actively shape emerging futures with a conscious and critical attitude. Integrating future-oriented topics into the music classroom and music teaching aligns music education with the broader social, ecological, and technological realities students face today (Buchborn et al., 2022). This chapter aims to demonstrate how music education can respond to global challenges by integrating three future-making dimensions – sustainability, democracy, and digitalisation – into teaching and learning.

To provide guidance, European policy papers such as the *European Education Area* emphasise these priorities. The European Commission (2020) set the goal of achieving the *European Education Area* by 2025, promoting quality education, inclusion, green and digital transitions, teacher support, and higher education cooperation.[1] To transfer these and other goals into educational practice, the European Council introduced several competence frameworks:

- *DigComp* (and its updates 2.0, 2.2, 3.0) defines digital competences for all citizens (Cosgrove & Cachia, 2025; Ferrari, 2013; Vuorikari et al., 2016, 2022).
- *DigCompEdu* focuses on educators' ability to integrate digital technologies into teaching (Redecker & Punie, 2017).
- *GreenComp* outlines environmental and sustainability competences (Bianchi et al., 2022).
- *Reference Framework of Competences for Democratic Culture* (*RFCDC*) emphasises civic, social, and democratic competences (Council of Europe, 2018a, 2018b, 2018c).

Together, these frameworks aim to support lifelong learning in a digital, sustainable, and democratic society (European Parliament & Council of the European Union, 2006). However, looking at the individual documents, this integrative and broad perspective is often narrowed, with digitalisation, sustainability and democratic education separated when it comes to concrete competences. In many respects, the objectives formulated in the different competence frameworks are compatible with each other. For example, both *GreenComp* and the *RFCDC* share several objectives with the *SDGs*, the *Sustainable Development Goals* (United Nations, 2015): *RFCDC* with regard to civic engagement, inclusion, and social responsibility; *GreenComp* with regard to responsibility. Both dimensions could be integrated in a coherent strategy aiming at social and ecological sustainability. However, the separation of the holistic strategy at the level of the competence models also leads to

[1] Further information on the *European Education Area* (*EEA*) can be found on the European Commission website: https://education.ec.europa.eu

tensions. A critical analysis of *DigComp*, *DigCompEdu* and *GreenComp* showed that those competence frameworks rarely connect with each other (Stade & Buchborn, 2025). For instance, digital practices often conflict with sustainability when energy-intensive technologies are involved. Furthermore, the focus on innovation and the goal of teaching skills in the use of the latest technologies in *DigComp* can lead to a throwaway mentality that runs counter to the responsible use of resources emphasised in *GreenComp*.

This creates significant challenges for music educators who seek to integrate digital, sustainable and democratic dimensions in a coherent way. Their task is to consciously and justifiably weigh these dimensions against one another and place them in perspective, acknowledging that in some situations they may even stand in tension.

To address these challenges, *Work Package 3* (*WP3*) of the project *Teacher Education Academy for Music: Future-Making, Mobility and Networking in Europe* (*TEAM*)[2] developed Open Educational Resources (OERs) that embed sustainable, democratic, and digital principles into music education. Using a Design-Based Research approach, these resources were developed for schools, teacher education, and professional development, and are accessible via the *Erasmus+ European School Education Platform*, *Open Music Academy* (*OMA*),[3] and the *TEAM* website.[4]

The chapter is structured to guide readers from context to practice. First, we provide an overview of current discourses on sustainability, democracy, and digitalisation in music education, with a focus on their connections and contradictions. Next, we introduce Design-Based Research (DBR) as a research approach that enables both the iterative and cyclical development of practical materials in close connection to researching educational practice. We will show how we designed learning offers for different music educational contexts that integrate sustainability, democracy, and digitalisation in a coherent way.

In the results section, the seven learning offers are introduced as well as the five design principles (Euler, 2017) we followed in our DBR process: *integration*; *participation*; *flexibility*; *creativity and criticality*; and *open access and collaboration*. Each learning offer illustrates how policy priorities and research insights can be translated into practical resources for music education. The chapter concludes with a discussion and outlook, reflecting on future-making pathways for music education in a European perspective.

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[2] *TEAM* is the *Teacher Education Academy for Music* https://teacher-academy-music.eu/. Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the *European Education and Culture Executive Agency* (*EACEA*). Neither the European Union nor *EACEA* can be held responsible for them.

[3] https://openmusic.academy/docs/jxCA1WSQjPB5QiLdAdPNws/team-music-learning-offers-on-sustainability-democracy-digital-music-making

[4] https://teacher-academy-music.eu

Connecting sustainability, democracy and digitalisation in music education

Music education today faces the challenge of responding to global transformations while maintaining its artistic and cultural integrity (e. g. Regelski & Gates, 2010). Three interconnected future-making themes – sustainability, democracy, and digitalisation – have become central to educational discourse and policy (e. g. Buchborn et al., 2022). This section explores how they shape music education, drawing on research that informs the design principles and learning offers presented later in the chapter.

Sustainability has become a driving force in music education (Barrett & Westerlund, 2023; Eusterbrock et al., 2024; König, 2024; Van Dooren et al., 2026), asking educators to rethink their roles and responsibilities in an era of global change. As Bates (2024) argues, "it would be untenable for music educators to stay on the sidelines, providing background music for the events happening on the field" (p. 54), urging the field to actively pursue "sustainable futures" (p. 55). Aligned with the United Nations' (2015) *SDGs*, sustainability is understood as a multidimensional concept that integrates ecological, social, and economic perspectives, along with values of inclusion and equity. This perspective connects to concepts like Shevock's (2018) *Eco-Literate Music Pedagogy* and Eusterbrock's (2022) *Climate-Conscious Popular Music Education*, which foreground ecological concerns while inviting broader reflection: How are social needs interrelated with ecological and economic priorities? And how can music education address these intersections creatively and critically?

The connection to inclusion and equity leads to discourses on participation and democracy, which have a long-standing tradition in music education research and practice. Many scholars draw on the works of Dewey (1916), Freire (2005), and Biesta (2023), emphasising that democratic education is not only about addressing political issues but also about creating participatory learning environments. Dewey's (1916) concept of education as a social process highlights the importance of collaborative inquiry and shared decision-making. This perspective is consistent with Freire's (2005) critical pedagogy, which understands participation as a means of self-empowerment that enables learners to question and actively change their reality. Recently, Biesta (2023) extended this discussion by arguing for education that promotes agency and responsibility through dialogic and co-constructive practices. Music education is consistently seen as holding significant potential for supporting democratic learning – whether through ensemble work that values every voice, classroom structures that encourage co-design, or activities that cultivate participation and agency (Bylica, 2024; Woodford, 2005; Allsup, 2007; Stade, Perakaki & Buchborn, in review).

Digitalisation has profoundly transformed the way we make and experience music, introducing new devices, software, and digital instruments that expand creative possibilities while reshaping musical cultures (Ruthmann & Mantie, 2017). In music education, digital tools and practices are often highlighted as ways to scaffold inclusion, accessibility

and participation (Gall, 2017; Gall & Backman Bister, 2024; Perakaki, 2025). At the same time, the interwoven dynamics of exclusion and hegemony of digital (music) practices are discussed critically (Selwyn et al., 2020; Treß, 2024). Further, the rapid spread of digital technologies often conflicts with principles of sustainability, raising questions about resource use, energy consumption, and long-term ecological impact (Stade & Buchborn, 2025). In this context, a post-digital understanding of music education becomes essential – one that critically engages with technology while situating it within social, cultural, and environmental frameworks (Buchborn & Treß, 2023; Treß et al., in press). The Swedish project *The Digital Student* exemplifies this approach, using Educational Design Research (EDR) to explore how Electronic Digital Instruments (EDIs) can function as instruments in their own right (Houmann et al., 2025). Findings highlight both technical challenges and creative opportunities, informing the development of the EDI Guidelines (Houmann et al., 2024) as resources for participatory and flexible digital musicking. Artificial Intelligence (AI) adds another layer of complexity, presenting both general educational challenges and specific implications for music education – from creative processes to ethical considerations – while also raising important questions about democracy and sustainability in how technologies are developed, accessed, and used (Bell et al., 2025). Addressing these developments requires innovative educational approaches that balance technological innovation, critical reflection, and sustainable practice (Selwyn, 2022, 2024).

This example demonstrates the interconnectedness among the three areas of sustainability, democracy education and digitalisation. Many authors emphasise a systemic and participatory approach. Overarching, Barrett and Westerlund (2023) argue for a transformative ecopolitical professionalism in music education, in which educators recognise their responsibility not only to musical expertise but also to social, ecological, and political systems. Through musicking (Odendaal et al., 2014; Small, 1998) and place-conscious pedagogies (Shevock, 2024), educators can address justice, equity, and ecological awareness. Maker music education (Treß, 2024) offers further ways to strengthen connections and dependencies.

Through integrative approaches, music education moves beyond siloed competences toward a coherent framework in which sustainability, democratic engagement, and digital skills mutually inform each other, supporting both ethical reflection and practical action in future-making.

Despite tendencies toward fragmentation on the level of generic competence models, in music education we already observe suitable concepts for integrating digitalisation, sustainability, and democracy education. Drawing on these discourses, the *TEAM* project sought to implement and explore the integration of sustainability, democracy, and digitalisation in music education using Design-Based Research. The next section outlines this research approach and explains how iterative design cycles and participatory processes shaped the development of the learning offers presented in the results.

Designing future-making learning offers – Researching future-making practices

Design-Based Research (DBR) is an approach that explores learning within real educational environments by repeatedly designing and refining interventions (Brown, 1992; Bakker, 2018; McKenney & Reeves, 2019). It emphasises studying complex problems in context rather than in controlled 'lab' settings, allowing researchers to collaborate closely with practitioners to develop solutions rooted in authentic practice (Collins, 1992). This collaborative, context-rich process helps DBR generate both practical innovations and theoretical insights that reflect "challenges of context, design, and enactment" (The Design-Based Research Collective, 2003, p. 5). A key element of DBR is working in iterative cycles of design, implementation, and analysis that contribute to improving the intervention and developing the underlying theoretical assumptions (Edelson, 2002).

Following this approach, the central objective of *WP3* is to co-create, implement and evaluate future-oriented learning offers and disseminate OERs for music education that address the outlined issues of sustainability, democracy, and digitalisation in different practice contexts in music education. Across multiple cycles of design, implementation, analysis, and re-design, the development of learning offers is informed by theoretical, empirical, and practical insights (see Fig. 1). Grounding interventions in school and university realities and co-developing them highlights both the practice-oriented and interventionist character of our study.

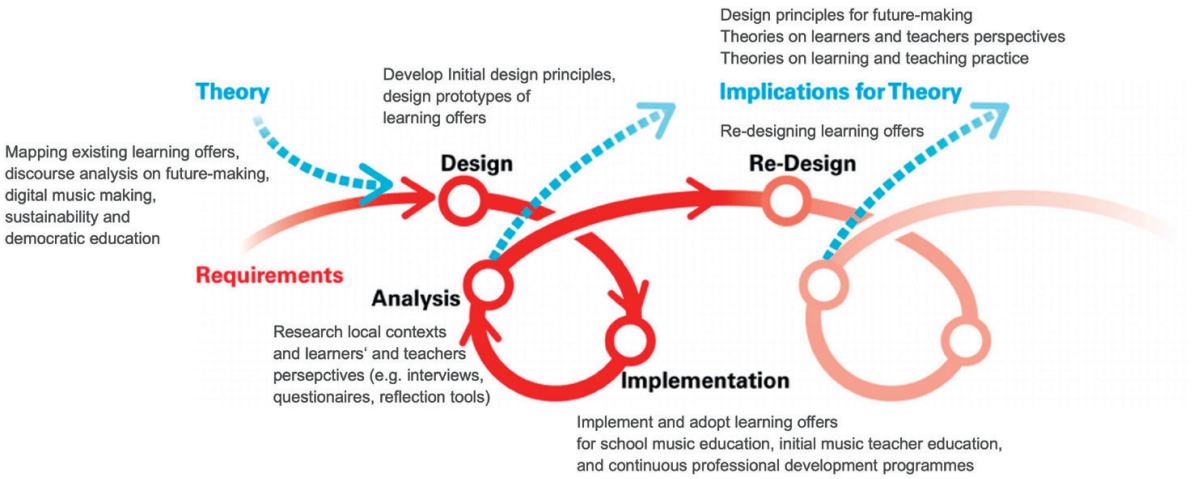

Fig. 1: Adapted version of Design-Based Research as an ongoing process of innovation (Fraefel, 2018, p. 9)

Our design and research efforts address multiple educational levels, target groups and stakeholders: In-service and pre-service teachers: as key mediators of change in music education. Music teacher educators: involved in professional development and music teacher education. Pupils and students: as active participants contributing their perspective to iterative refinement.

For development and testing we worked in schools, in university contexts and in ongoing teacher education institutes from the *TEAM* Consortium or the *TEAM* Associate Partner network. In this way, we were able to gain perspectives from Austria, Belgium, Germany, Greece, Ireland, Lithuania, Portugal, Slovenia, and Sweden. In addition, international workshops held as part of the conferences of the European Association for Music in Schools (*EAS*) enabled us to engage with music educators from further countries. The extent to which the learning offers can be used across different groups depends on their specific design and context. Because the materials are conceived as adaptable resources, the co-design approach enables educators and learners to modify and further develop them according to their local needs.

The co-design process combines two components: prospective planning based on theory and empirical insights, and reflective redesign informed by feedback. In line with DBR's aim to generate theory, our goal is not only to design learning interventions that advance educational practice but also to gain insights into classroom practices, the perspectives of teachers and learners and the implicit logics of approaching future-making issues in music education. Therefore, we used multiple strategies and data collection tools to capture both immediate feedback and deeper insights into practice. Across the design cycles, we employed:

- Participant feedback through short questionnaires and structured reflection tasks.
- Learning diaries, where participants documented their experiences, challenges, and reflections on the activities.
- Group discussions, enabling dialogic feedback and collaborative sense-making.
- Platform-based feedback on the EDI guidelines, where users could comment and suggest improvements directly on the resources.
- Observation during interventions, particularly in workshops and seminar settings, to analyse interaction and engagement as a basis for educational reflection.
- Iterative design reviews, where feedback was discussed collectively by the project team before implementing changes.

To deepen understanding beyond surface-level feedback, we integrated the *Documentary Method* (Bohnsack et al., 2010) in selected cases. This reconstructive approach goes beyond what participants explicitly state by analysing the implicit knowledge structures and orientations that guide their actions and interpretations. It delves into the underlying nuances, shedding light on the less visible dimensions. Through comparative analysis of verbal data we collected in the design implementations, the documentary method allowed us to uncover everyday theories and tacit assumptions – for example, how students perceive democratic participation in music education (Buchborn & Stade, 2025) or how music educators implement digital music practices in music teacher education.

By connecting DBR with the Documentary Method, we established what Buchborn (2022) terms documentary design research – an approach that combines iterative design and reconstructive analysis. This dual perspective ensures that learning offers are tested and refined in practice and simultaneously, theoretically grounded in the lived experiences and orientations of educators and learners.[5]

Rather than outlining every stage of the iterative redesign, we turn to two illustrative examples that show how feedback informed the design process:

- Example 1: *sustain_sound* – A five finger feedback system on what went well and what could be improved, revealed comments such as *'Good use of the ritual of Schafer's Sound Education'* (Schafer, 1992), *'Discuss more texts'*, and *'How can soundscapes be used in school?'* These insights led to adjustments across cycles: balancing input and practical tasks, reintroducing composer involvement, and expanding focus on school implementation. This demonstrates that design development is far from linear.
- Example 2: *Who sets the tone here?* – Following the steps of the Documentary Method we analysed group discussions of the participating students. The formulating interpretation revealed 'what' was said, while the reflective interpretation shows 'how' content was discussed and processed in the interaction. This analysis uncovered not only the everyday theories, norms and beliefs of the participants but also the implicit assumptions about participation and group dynamics (Buchborn & Stade, 2025). In response, the third cycle introduced reflective tasks based on transcribed discussions and expanded opportunities for co-design and shared decision-making.

This illustrates how a DBR framework enhanced by reconstructive approaches like the Documentary Method can contribute to both practical and theoretical development in music education. The project not only created context-sensitive OERs but also expanded understanding of how educators and learners understand themes such as sustainability, democracy, and digitalisation.

[5] Detailed information on the format, methodological foundations and research practice of Documentary Design Research is given in Buchborn & Völker (2025).

Results: Design principles and learning offers

The following section presents the results of our Design-Based Research. All learning offers are available on an open platform *OMA* (https://openmusic.academy) as OERs under the Creative Commons license and also from the *TEAM* website. The platform invites music educators to explore, publish, co-design and adapt learning and teaching material for schools, music schools, higher education and informal learning environments. In line with the *OMA*'s philosophy, we encourage educators and students to use and further develop the *TEAM* learning offers across diverse European and international contexts. It is important to note that these learning offers with their different scopes only provide small, focused contributions to the vast discourses surrounding sustainability, democracy, and digitalisation. They are intended to spark reflection and serve as starting points for lifelong engagement with these topics rather than as comprehensive solutions.

Before presenting the individual learning offers, we make explicit five principles that guided their development. These principles, which will be introduced below, emerged from three bodies of sources:

- Policy papers (Council of the European Union, 2021; European Commission, 2019, 2020; European Parliament & Council of the European Union, 2006) and competence frameworks *DigComp*, *GreenComp*, *RFCDC* (Bianchi et al., 2022; Council of Europe, 2018a, 2018b, 2018c; Ferrari, 2013; Redecker & Punie, 2017; Vuorikari et al., 2016, 2022), which emphasise digital competence, sustainability, and democratic participation but remain largely disconnected.
- Content-specific theory and concepts in music education on sustainability, democracy and digitalisation, including their interconnectedness and empirical findings (see literature review above).
- Insights from our *Documentary Design Research* approach, which highlighted the need for participatory, adaptable, and solutions that foster creativity.

The European policy papers emphasise digital literacy, sustainability, and democratic participation as essential for lifelong learning. However, as mentioned earlier, related competence frameworks remain largely disconnected from each other, creating challenges for educators who aim to integrate these dimensions coherently (Stade & Buchborn, 2025). Our principle of *integration* (DP 1) directly responds to this gap, ensuring that sustainable, democratic, and digital aspects are treated as interrelated components of music education. The *RFCDC* (Council of Europe, 2018a, 2018b, 2018c), which focuses on civic engagement, informed our principle of *participation* (DP 2), embedding co-design with teachers, students, pupils, and researchers into every stage of the development. Additionally, *flexibility* (DP 3) reflects the European Education Area's (Council of the European Union, 2021;

European Commission, 2020) call for adaptable learning environments that respect diverse national and local contexts. Moreover, *creativity and criticality* (DP 4) respond to the need for education that not only adopts technology but also interrogates its cultural, ecological, and ethical implications. Finally, *open Access and collaboration* (DP 5) align with the EU priorities for open educational resources and knowledge sharing across borders. These five design principles were further refined through DBR cycles. Feedback from educators, pupils and students underscored the importance of modular resources and activities that enable artistic exploration while encouraging critical reflection.

In their final version, the design principles form a coherent framework for designing learning offers that address future-making themes and embody the democratic and inclusive spirit envisioned by European education policy:

- DP 1 – *integration*: Each design seeks to connect sustainable, democratic, and digital dimensions in a meaningful and responsible way rather than treating them in isolation.
- DP 2 – *participation*: Teacher educators, teachers, students, pupils, and researchers act as co-designers, ensuring that learning offers are grounded in real educational contexts.
- DP 3 – *flexibility*: Resources are modular in design and can be adapted to different school types, national contexts, and learning needs.
- DP 4 – *creativity and criticality*: Activities encourage artistic exploration while fostering multi-sited reflection on sustainability, democracy and technology.
- DP 5 – *open access and collaboration*: All offers are published as interactive OERs to promote sharing and collaborative improvement.

The table below summarises the learning offers underpinning these principles as well as their target groups, aims, and methods:

Learning offer	Main target groups	Aims in relation to the three dimensions	Content and methods
Musical social hour (project-based learning activity)	Pupils	Link music to SDGs and community engagement	Project-based learning; Design thinking; collaborative projects
sustain_sound (workshop and modular seminar)	Pupils, students, teachers, teacher educators	Explore soundscapes and ecological sensitivity	Acoustic ecology; listening and composing
sound_stories (workshop)	Pupils, students, teachers, teacher educators	Address sustainability through music and storytelling	Narrative-based composition; concept mapping
Democracy in music education (workshop)	Students, teachers, teacher educators	Reflect on democratic practices in education	Group discussions; participatory warm-ups
Who sets the tone here? (seminar)	Students, teachers, teacher educators	Practise rotating leadership and co-design	Barcamp-inspired seminar; rotating leadership, collaborative decision-making
EDI Guidelines (modular resources)	Pupils, students, teachers, teacher educators	Integrate electronic digital instruments as creative instruments	Practice-based (EDI), participatory approach; 10 thematic sessions
Songwriting and AI (workshop and self-learning course)	Pupils, students, teachers, teacher educators	Explore AI in songwriting and critical reflection	Modular design; songwriting tasks; reflective discussion

Table 1: Overview of the future-making learning offers

The first column shows what we mean by the term learning offer. A learning offer can be a short workshop or a single seminar session, but also a longer seminar or a modular seminar concept in which individual sessions can also be used independently or in a different combination, a proposal for project-oriented work, a self-study or training course. Some learning offers are also available in several versions or can be used in different educational contexts. In the second column, we therefore indicate the target group for whom the offer is primarily intended: pupils in general education schools, music education students, or teachers who are already working in schools.

Having outlined the guiding principles and having provided an overview of the learning offers, the following subsections illustrate how these principles were applied in practice and how the learning offers bring together sustainable, democratic, and digital dimensions.

Musical social hours

The idea for the learning offer *Musical social hours* originated from internship formats that are established at many schools in Europe. Pupils perform social services for the community in the context of their school during so-called social hours. They help people with disabilities, elderly people or families in stressful situations in everyday life, working in nursing homes, hospitals or other charitable institutions. *Musical social hours* developed this format further in a subject-specific manner. As part of a workshop based on design thinking approaches (Gekeler, 2019; Knapp et al., 2016), participants explore ways of doing social work through musical engagement. The *Sustainable Development Goals* (United Nations, 2015) serve as a starting point. Pupils familiarise themselves with the *SDG*s and their different dimensions and relate these goals to their local context. Further, they explore formats that connect musical activities with social and sustainable engagement and foster local collaboration. After designing individual formats, the students test them in the local community. The learning offer closes with reflection on the field-based experiences.

The learning offer integrates issues of sustainability with democracy education by focusing on participation and social engagement in local contexts (DP 1). Aspects of digitalisation could play a role, if students are addressing them in the development of their formats. However, they are not central to the concept. The open, project-based format invites educators and students to adapt it to different school types and national contexts (DP 2 & 3). Exploring the individual needs of learners and people in their local environment is a key element of the concept, as well as fostering creativity and connecting it to critical reflection of issues of sustainability (DP 4).

Students prepared sound installations that were presented at school for Earth Day. The first of them, called *Music to My Ears*, included playing classical music combined with their own recordings of the sounds of nature. With this project, students introduced the idea of attentive listening to nature, inviting others not only to reflect on its beauty but also on its problems. A second composition featured a musical performance using different materials considered waste – plastic bottles and bags, cans of sugary drinks, and others. By presenting these items as instruments worth listening to, students encouraged people to think more broadly about possibilities for reuse. In another notable project, students prepared a concert for a retirement home. The theme of the concert was framed as a question: *'What does it mean to be sustainable today?'* In this project, students rethought their musical pieces in light of different SDGs.

Testing the design in school contexts revealed students' need for guidance and references, especially in the phase of development in younger age groups. Structured scaffolding in the beginning, in turn leads to motivated and independent social engagement in the implementation of the individual projects and a high level of identification with one's own ideas in retrospect.

sustain_sound

sustain_sound is a modular seminar and workshop concept that explores the relationship between sound, sustainability, and futures-thinking in music education (Völker et al., 2025). The programme, rooted in acoustic ecology (Truax, 1978), offers a reflective and creative exploration of changing sound environments (DP 4). It begins by theorising listening as a mode of cultivating resonance with nature (Schafer, 1994). The concept addresses the gap between climate knowledge and climate action, drawing on Schneider's claim that rational information alone fails to mobilise societal engagement (Schneider, 2023, p. 132). Bridle (2023) explains the lack of emotional attachment to the non-human world as a key barrier to behavioural change. Finally, a sustainable and ecological music education perspective frames a disciplinary approach as human-nature relationships through artistic and sensory experiences (Eusterbrock et al., 2024; Shevock, 2018; König, 2024).

Building on this foundation, Schafer's listening practices (Schafer, 1992) and the soundscape movement are introduced, outlining Schafer's and Westerkamp's seminal contributions (Schafer, 1994; Westerkamp, 2002). Soundscape practices such as archiving environmental change through field recordings like the *World Soundscape Project* (Schafer, 1994), documenting ecological loss (Krause, 2013), and improving acoustic environments through acoustic ecology and acoustic design (Schafer, 1994; Moshona et al., 2024) are discussed. Practical assignments include drawing soundmaps and going for a soundwalk (DP 4).

Finally, *sustain_sound* merges the creation of soundscapes with futures thinking (Voros, 2001) to stimulate creative engagement with alternative ecological futures. The central assignment asks learners to select a personally meaningful place and compose soundscapes that explore how it might sound across different possible futures, considering disappearing, persisting, and emerging sounds, envisioning both dystopian and utopian sonic futures. In response to participants' feedback, school projects were incorporated into the seminar version of the learning offer, where students teach parts of the approach. The project concludes with a presentation and a reflection on the pedagogical value of artistic-aesthetic work for sustainable education.

Overall, *sustain_sound* can be regarded as a postdigital approach, linking field recordings with attentive and critical listening to the environment. By looking at sustainability from a musical and emotional perspective, it contributes to a democratic shaping of futures (DP 1). The fact that participants choose their own focus and create their own sonic futures makes the learning offer highly participatory (DP 2).

sound_stories

The workshop *sound_stories* introduces sustainability through music and storytelling, aligning with the aim of fostering future-making practices that integrate sustainability, democracy, and digitalisation. Its design is grounded in a transformative learning philosophy (Lange, 2023) and highlights the role of emotions (Grund et al., 2024; Ojala, 2013). The relationships between the sustainability dimensions form the basis for the storylines of one fictional and one research-based story (Lawrence, 2014). The participants use these stories as prompts to reflect on what sustainability means in their own context.

They collaboratively build a physical concept map using papers and yarn on the floor. Concept mapping is regarded as an active learning tool (Cañas et al., 2023), where the process matters more than the outcome. This collaborative mapping fosters deliberative communication, contributing to democratic goals in public education (Ojala, 2013). This pluralistic approach acknowledges sustainability's complexity, including uncertainty, dissensus and value conflicts (DP 2).

Moving from collaborative mapping to smaller groups, participants examine personal habits and norms and listen to others' perspectives. Based on these conversations, they create their own stories and compositions. These compositions connect musical elements to specific sustainability issues and incorporate real-world sounds (Alvim, 2021), either live, digital or recorded. The central issue here is therefore the creative and critical examination of sustainability (DP 4).

Participant feedback underlined the constructive role of emotions and the need for a safe, participatory learning environment. For instance, the concept mapping was added after the first trial. Together with the stories, it encouraged ongoing dialogues that highlighted various perspectives on sustainability. Acceptance of divergent understandings (Ojala, 2013) and acknowledgement of participants' emotions is important to create a learning environment that is "safe enough" (Grund et al., 2024, p. 319). In this sense, sustainability is not only to be regarded as topical knowledge, but as a pedagogical orientation that shapes and foregrounds democratic learning and teaching experiences.

In each cycle, the participants developed highly individual and original musical sketches, some of which told moving stories related to sustainability. This shows that the format offered participants the opportunity to bring up topics related to personal, and sometimes emotional experiences. Overall, by combining collaborative reflection, creative composition, and possible digital sound practices, *sound_stories* integrates sustainability, democracy, and digitalisation in music education (DP 1). At the time of writing, the learning offer is being adapted for younger learners (DP 3).

Democracy in music education

The workshop *Democracy in music education* foregrounds democratic participation in music education. Building on the aforementioned literature on democracy education, it is important to note that democracy and democracy education are complex concepts that encompass many different and even conflicting interpretations, such as formal versus social models, consensus-oriented versus conflict-oriented approaches, or republican versus liberal conceptions (Mouffe, 2000). Therefore, the workshop focuses on two key aspects: participatory warm-up activities and opportunities for individual and collective reflections on democracy and participation. In our view, it is essential to foster an open exchange about democracy and democratic education for music teachers and students, rather than imposing a shared and concrete definition.

As Buchborn and Stade (2025) highlight, music students perceive their daily university experience as not being particularly democratic. Addressing this problematic insight, the learning offer begins with participatory warm-up activities that encourage learners to enter into dialogue through musical activities. Through joint improvisation, shared pulse exercises, and collaborative sound exploration, participants directly experience principles of democratic participation – listening to one another, negotiating ideas, and shaping the collective outcome. Within this framework, a learning environment is established where each voice can contribute and be valued (DP 2).

Afterwards, participants engage in personal reflection, connecting to previous experiences of democracy and participation in school, university, and teaching, before entering into dialogue and collaborative group discussions or parallel sessions on different democratic approaches in music. In this learning offer, as well as that of *Who sets the tone here?*, group discussions provide opportunities for meaningful exchange. Feedback in the seminars so far indicates that such dialogic and reflective spaces are rare.

Following these reflections, we introduce and discuss key concepts of democracy and explore how democratic education can be implemented within music classrooms and music education settings. These impulses cover aspects such as different definitions of democracy or the ladder of participation as a tool to reflect on music education. The *RFCDC* (Council of Europe, 2018a, 2018b, 2018c) serves as another starting point for reflecting music education praxis (Stade, Perakaki & Buchborn, in review). Finally, concrete examples are presented and discussed to illustrate how democratic methods and topics can be implemented. This is complemented by an online idea pool.

Foremost, the learning offers show connections between democracy and sustainability. Democracy is a social construct and deeply connected to social dimensions of sustainability, inclusion and accessibility. Therefore, the workshop should reflect this intersection as well, illustrating how democratic education can become a lived experience within the future-making framework (DP 1).

Who sets the tone here?

The short workshop concept of *Democracy in music education* serves as a basis for reflecting on democracy and participation. The learning offer *Who sets the tone here?* takes the same approach, but delves much deeper into exploring and experiencing what democratic music education can or should look and sound like. Building on pre-existing seminar concepts by Theisohn (in press), this learning offer emphasises shared responsibility, participatory structures, and rotating leadership. It is designed for music students and can be implemented flexibly, ranging from short modules to a full seminar. Central aims include exploring democratic forms of music-making, enabling students to co-design seminar sessions, and promoting reflective engagement with participation and power dynamics. One principle is not to teach democracy but to build a democratic space – often in surrounding hierarchical power structures of music universities or schools (DP 2).

The learning offer begins with self-reflection tasks like in the previous learning offer. Afterwards, the following actions have been developed to make the offer as democratic as possible:

- Rituals such as participant-led warm-ups and the use of democratic hand signs establish a collaborative culture from the outset.
- Excerpts from transcripts of group discussions derived from the accompanying *WP3* research serve as ways to reflect on implicit knowledge that structures everyday life.
- A dedicated module on feedback uses deliberately incorrect feedback strategies to help students derive criteria for constructive, respectful, and recipient-centred feedback.
- Subsequent inputs introduce concepts such as the *veto-joker* (Plath, 2023), the ladder of participation (Hart, 1992), the *RFCDC* (Council of Europe, 2018a, 2018b, 2018c), and children's and human rights (UNICEF, 2019; United Nations, 1948, 1989).

The core of the seminar consists of student-driven sessions, in which participants choose topics, plan activities, and lead participatory musical practices among themselves but also at school (DP 2). Following their own interests, democracy in music and – vice versa – music in democracy are two emerging guidelines on how the participants can explore possible connections between music and democratic practices.[6] Democracy in music can mean democratic composition techniques like the 12-tone scale or creative low-barrier methods of musicking (DP 4). Music in democracy can focus on discrimination in the music business or music in political protest and political representation. Participants came up with very different ideas like leading an ensemble or a choir with and without a conductor, using

[6] See also "identities in music and music in identities" (MacDonald & Saarikallio, 2022)

dance to promote bodily experiences with music, or discussing music on social media as part of protest movements.

Another important part of the learning offer is contact with the world outside the learning group: Depending on the local possibilities, this can lead to visiting barcamps,[7] going to rehearsals of community music projects or inviting conductors or ensembles that embrace democratic participation and artistic citizenship (Elliott et al., 2016) in their artistic work (DP 3). The course concludes by coming back to the student's self-reflections from the start and reflecting on what has been changed since then. In a group discussion, the participants share their thoughts.

Looking into the connections between the future-making topics (DP 1), digital elements like etherpads, where every participant can write anonymously and simultaneously, and also transparent literature resources are additionally important in deepening participation in digital communication. In order to connect democracy education with sustainability, the learning offer follows the structure of doing, reflecting and critically discussing. Topics range from how students understand *Bildung* (education) as a top-down or bottom-up approach (Buchborn & Stade, 2025, p. 35) to challenge of sustaining democracy as a globally declining form of government in the face of rising autocratisation (Nord et al., 2025).

EDI Guidelines

The *EDI* learning offer is grounded in the Swedish national project *The Digital Student* created by Anna Houmann, Joakim Barfalk, Per Berlin Englund and Erik Lundahl (Houmann et al., 2024; Houmann et al., 2025), a practice-based research initiative commissioned by the Swedish government (2017–2024) under the ULF (Utbildning, Lärande, Forskning) [Education, Learning, Research] agreement. This project aimed to strengthen collaboration between academia and schools by developing sustainable models for research-informed teaching (Houmann et al., in press). At its core, the project explored how Electronic Digital Instruments (EDIs) – composite systems of computers, user-configure software (such as Ableton Live or FL Studio), and digital controllers – can function as instruments in their own right within music education.

Through iterative cycles of Educational Design Research (McKenney & Reeves, 2019), researchers, teachers, pupils and students co-designed and tested interventions in instrumental and ensemble courses, capturing lived experiences of teachers, pupils and students. These interventions revealed both opportunities and challenges of integrating EDI into teaching – from technical troubleshooting to creative possibilities such as live remixing, finger drumming, and ensemble synchronisation. The findings informed the

[7] A barcamp is an open, participantdriven event where attendees collaboratively create the session schedule and actively share knowledge and ideas.

creation of the original *EDI Guidelines* (Houmann et al., 2024), which emphasise creativity and criticality (DP 4), flexibility (DP 3), and participatory approaches (DP 2) to digital musicking.

Adapted, translated, and expanded within the *TEAM* project, the *EDI* learning offer introduces educators and learners to EDIs as creative tools in music education. The resource consists of ten thematic sections that explore both the opportunities and challenges of integrating digital instruments into teaching and learning. Examples include activities such as "Play your DAW", where pupils use their digital audio workstation as a live instrument, and "Controller exploration" (Houmann et al., 2024), which encourages learners to experiment with different surfaces to create unique soundscapes. These tasks illustrate how EDI can be integrated into ensemble settings, improvisations, and composition, while fostering critical reflection on technology's role in music-making (DP 4). The guidelines encourage a practice-based, participatory approach (DP 2), where users experiment, adapt, and reshape digital tools according to their own educational contexts. Designed for pupils, music teacher students, and teachers, the learning offer promotes flexibility (DP 3), creativity (DP 4), and inclusivity, inspiring educators to view technology not as an add-on but as an instrument in its own right – expanding the expressive and pedagogical possibilities of music education.

The *EDI* learning offer exemplifies the *TEAM* project's commitment to future-oriented, research-informed design. At its core, it integrates digital tools with reflective practices and sustainable concerns (DP 1), encouraging educators to consider resource use and ethical implications alongside technological innovation. Developed through participation in iterative co-design workshops and classroom interventions (DP 2), the offer reflects the lived experiences of teachers and students and ensures practical relevance.

Songwriting and AI

Songwriting and AI learning offer was initially developed as part of the project *KuMuS-ProNeD*[8] and is aimed at school music teachers as well as students in music teacher education and school music education. In *TEAM*, the learning offer was adapted, translated, implemented and tested in further European contexts of music teacher education and continuous music teacher education.

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[8] *KuMuS-ProNeD* (01JA23K05D, https://kumus-proned.de) is funded by the *European Union – NextGenerationEU* and supported by the German Federal Ministry for Education, Family Affairs, Senior Citizens, Women and Youth. The views and opinions expressed are solely those of the author and do not necessarily reflect the views of the European Union, European Commission or the Federal Ministry of Education, Family Affairs, Senior Citizens, Women and Youth. Neither the European Union, the European Commission nor the Federal Ministry of Education, Family Affairs, Senior Citizens, Women and Youth can be held responsible for them.

The design connects songwriting and digital music production with critical reflections on the implications of AI use in different contexts of the creative processes. The aim of the learning offer is to teach competences that enable learners to use digital tools and artificial intelligence in a self-determined and critical manner (Buchborn & Treß, 2023). The approach is in line with the UNESCO (2024) *AI competency framework for teachers* that was developed in the context of the *Global Education 2030 Agenda* (United Nations, 2016). The framework emphasises the importance of a "human-centred mindset" that "defines the values and critical attitudes teachers need to develop towards human–AI interactions" and calls for a "deeper understanding of fundamental ethics of AI (Wieczorek et al., 2025), skills to make safe and responsible use of AI, and comprehensive competencies to participate in the adaptation of ethical rules" (UNESCO, 2024, p. 23).

Connecting these aims with the competence frameworks *DigComp* (Vuorikari et al., 2022) and *DigCompEdu* (Redecker, 2017) leads to the following goals of the respective learning offer (Buchborn et al., in press):

- Teachers and/or students explore AI tools and use them in postdigital songwriting processes (*DigComp*, 5.3).
- Teachers and/or students critically reflect on creative postdigital processes with regard to legal, ethical, moral implications, questions of originality, ownership and creativity (*DigComp*, 3.3, 4.2).
- Teachers develop learning and teaching scenarios for songwriting with AI and support and accompany students' independent, artistic and creative processes (*DigCompEdu*, 3.1).
- In a professional community of practice, teachers and students in music teacher education reflect on their classroom practice (*DigCompEdu*, 1.3).

The different versions and the modular concept of the learning offer give educators flexibility and invite them to adapt to a variety of music education contexts, and learner needs (DP 3). Participants in different stages of music teacher education collaborate with pre-service and in-service teachers in co-creating learning offers for students in schools and test them in real educational contexts (DP 2). Moreover, students and educators are invited to explore GenAI tools and practices in creative processes of songwriting, while continuously reflecting on possible impacts critically. Putting critical reflection in the centre of the learning offer also leads to critical engagement and reflection of issues related to sustainability and democratic music education – e. g. by revealing questions of GenAI – related hegemonies and reproduction of stereotypes (DP 1 & 4).

Discussion and Outlook

There is a critical gap: While European competence frameworks provide guidance on sustainability, democracy, and digitalisation, they remain largely disconnected (Stade & Buchborn, 2025). Addressing this gap has been central to our work. Building on existing work by music education researchers who actually do link the topics, the *TEAM* project sought to bridge these gaps through Design-Based Research and participatory approaches, resulting in learning offers that embody five guiding principles: *integration*; *participation*; *flexibility*; *creativity and criticality*; and *open access and collaboration*. The approach thus demonstrates a path from abstract political goals to concrete teraching practices.

Integration was not only a theoretical aspiration but a practical necessity. While some learning offers, such as *Musical social hours*, focus primarily on sustainability and democracy, digitalisation plays a more optional role. This is intentional since the design prioritises local, social engagement and participatory practices, where digital tools may not always be necessary or contextually relevant. However, the overall set of learning offers collectively addresses all three dimensions – digitalisation is central in offers like *EDI Guidelines* and *Songwriting and AI*, while sustainability and democracy are foregrounded in others. Together, these resources form a balanced portfolio that operationalises integration across diverse educational contexts, ensuring that no single dimension dominates but that all are represented within *WP3's* future-making vision. For example, the *EDI* learning offer goes beyond teaching skills by embedding sustainability concerns – such as discussions on energy use and resource implications – into activities like "Play Your DAW" and "Controller Exploration" (Houmann et al., 2024). Similarly, *sustain_sound* combines acoustic ecology with futures thinking, prompting learners to create soundscapes that reflect ecological transformations while engaging in democratic decision-making during group work. These examples illustrate how integration transforms abstract policy goals into classroom practices.

Participation emerged as a cornerstone of both design and enactment. Drawing on Dewey's (1916) concept of education as a social process and Freire's (2015) emphasis on dialogic pedagogy, our learning offers positioned teachers, pupils, students, and researchers as co-designers. In the learning offer *Who sets the tone here?*, rotating leadership and barcamp-inspired formats challenged hierarchical norms, promoting agency and shared responsibility. Feedback from students confirmed the value of these approaches, while also revealing the rarity of such participatory spaces in higher music education (Buchborn & Stade, 2025).

Flexibility was essential given the diversity of European classrooms in terms of resources, curricula, and cultural expectations. Modular designs allowed adaptation to local contexts. For instance, the *Songwriting in AI* offer provides flexible modules for professional development or single lessons, while *sound_stories* enables educators to tailor

narrative-based composition tasks to sustainability issues. This adaptability aligns with the European Education Area's call for context-sensitive learning environments (Council of the European Union, 2021; European Commission, 2020).

Creativity and criticality were not add-ons but integral to every design. Activities such as remixing folk songs with EDIs (Houmann et al., 2024, 2025) or composing sonic narratives of melting glaciers in *sound_stories* exemplify how artistic exploration can coexist with critical reflection on technology, ecology, and ethics. These approaches resonate with Bates' (2024) call for music educators to move from the sidelines to active engagement in shaping sustainable futures.

Publishing all resources as *Open Access* on a *collaborative* platform like the *OMA* reflects EU priorities for knowledge sharing and positions OER as catalysts for Open Educational Practices, where educators continuously adapt and improve resources through collaborative networks. The OERs are also supplemented by publications that provide insights into the accompanying research and evaluations carried out as part of *WP3*. Our document analysis provides detailed insights into the alignment of policy papers and competence frameworks and refers to the compatibility issues cited at the outset (Stade & Buchborn, 2025). A reconstructive study focusing on a first cycle of testing *Who sets the tone here?* at a music university in Germany revealed, for instance, how students perceive democratic participation in music education (Buchborn & Stade, 2025). We reconstructed a discrepancy between the normative ideas of democracy held by the students interviewed and how democracy is actually practised in the university context. Opportunities for participation in everyday university life appear to be limited and seem to be better utilised by high-achieving students. In addition, diverging concepts of good education come to light in the context of participation, and the logic underlying group work processes becomes clear. We are currently comparing these insights with the data we collected in Belgium, Greece, Slovenia and Sweden. This gives us a nuanced picture and provides insights into local and institutional trends in different parts of Europe.

Further, we examine how digital music practices are implemented in higher education. Analysing a first set of data from German higher education reveals how hegemonies connected to conservatory traditions are framing such a process of change in teacher education: Our interpretations show, how processes of designing entrance exams and curricula aiming to offer music teacher education for musicians socialised in postdigital practices are conflicting with implicit knowledge guiding everyday practice in the conservatories. Orientations towards traditional concepts of music theory and piano performing, and the prioritisation of live, embodied performance over asynchronous studio production, mean that the new courses are perceived as alien in the institution. Insights like this not only informed iterative redesign of our learning offers but also validated the five guiding principles as practical and theoretically grounded approaches for future-making in music education.

However, scaling these practices across Europe requires a culture of openness – educators and institutions must share materials, insights, and approaches. If this spirit of exchange grows, platforms like *OMA* can become key enablers for participatory, inclusive, and forward-looking music education.

Our experiences highlight four implications:

- Balance global and local: Music education can connect global challenges with local contexts, engaging students creatively and reflectively through sound, movement, and dialogue.
- Balance sustainability, democracy and digitalisation: Constant reflection on missing, existing, or contradictory connections between future-making topics remains a key challenge.
- Democracy as lived practice: Participatory learning must move beyond ideals to become tangible experiences through shared leadership, co-creation, and critical inquiry.
- Dialogic innovation: Iterative design, feedback cycles, and cross-national exchange help redefine what democracy, sustainability, and digital literacy means in diverse contexts.

Taken together, our findings show how policy frameworks, participatory design, and iterative research can converge to create actionable strategies for music education. The results demonstrate that integrating digitalisation, sustainability, and democracy is not only possible but pedagogically enriching when guided by coherent principles and participatory processes. Each learning offer, whether focused on EDIs, soundscapes, storytelling, or democratic leadership, serves as a microcosm of the broader aim articulated in the introduction: to prepare learners to actively and critically shape cultural and educational futures in time of global change. Music education can move beyond adaptation to actively co-create the futures it envisions.

At the same time, the project revealed new questions. Co-design processes can themselves reproduce gaps or imbalances – for example when technological enthusiasm overshadows ecological concerns, or when participatory formats remain superficial. Addressing these challenges requires continuous reflection on how responsibly the three dimensions are connected and how educators can support learners in making informed decisions about their actions.

Working across national boundaries revealed both the richness and complexity. Interpretations of sustainability, digitalisation, and democracy vary widely, requiring sensitivity and adaptability. Technical barriers and differing levels of digital competence remain challenges. Convincing participants to actively use the materials, provide feedback, and develop them further directly on the *OMA* is time-consuming and challenging. However,

these obstacles also underscore the importance of flexible, participatory, and open resources that can evolve through collective effort.

Looking ahead, integrating digital, sustainable, and democratic dimensions will remain central to reimagining music education. According to the results of *WP3* we see three key priorities:

(1) Deepen integration of the three themes, moving beyond silos toward holistic learning experiences.
(2) Investigate long-term impact and advance knowledge on music education for future-making.
(3) Expand cross-national comparative studies to understand trends and local adaptations.

Further methodological development is also needed. Criteria for participatory quality can strengthen collaborative processes and research-practice partnerships. Sustained collaboration between universities and schools will be important for scaling and embedding these approaches. Ultimately, music education holds the potential not only to respond to global change but also to shape it by enabling learners and educators to co-create futures through participatory and creative practices. In doing so, music education could fulfil its transformational potential – empowering learners and educators to shape cultural and educational futures in times of global change.

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