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**A constructivist approach to music education with DAWS**


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# A CONSTRUCTIVIST APPROACH TO MUSIC EDUCATION WITH DAWS

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## Abstract

*Increased interest in music technology education in recent years has prompted music teachers, technology educators and theorists to reconsider both the human and technical processes rendered by creative work in digital sound media. Music technology learning environments range from more structured classroom learning to informal, autodidactic practices, where student identity and creative agency are paramount. However, there is a need to develop more specific teaching and learning strategies that move beyond basic instructional or blended learning environments for digitally literate students (Darlis & Sari, 2021). This chapter discusses common learning practices of Digital Audio Workstation (DAW) users, and the dangers of superimposing conventional music teaching strategies to music technology when the learning style, participatory culture and multimodal affordances are inherently different. This article draws on a recent study involving a constructivist approach with secondary school students in Aoteaora New Zealand via creatively navigating "blocks" in students' autodidactic processes. Some findings are reported before some initial ideas of how teachers can incorporate aspects of individual identity (e.g., cultural, social, and political contexts) into DAW learning are offered.*

## Keywords

Autodidacts; DAW; music; blended learning

## Introduction

The purpose of this article is to inform further development of the current educational framework for music technology in Aotearoa, in particular for learners who use Digital Audio Workstations (DAWs) as their primary mode of musical expression. The role of DAWs in the creative process for young digital composers is examined, as is how their multimodality can offer affordances for the expression of individual identity. Current models and definitions of blended learning in this space are explored and a new model which facilitates expression as a cornerstone for learning is suggested.

In theory, the outcomes of any music technology curriculum are straightforward and conventional teaching approaches can be applied. This may involve designing workable outcomes, learning technical and theoretical skills, and include notions of what makes music enjoyable. While the development of technical skills in music has traditionally been orientated towards mastery of musical instruments and singing, over the last few decades the musical attributes young people see as being applicable within the industry have changed significantly. The sheer number of options possible when it comes to achieving "success" has grown to fill needs across every aspect of music in our daily lives.

This change in emphasis reflects how we now interact with music; the advent of streaming services and home studios means that the demand for music has never been greater and access to potential listeners never easier. Roles (and rules) in the industry are constantly evolving as more conventions around how music is made and communicated are challenged, broken and replaced with something entirely new. This article takes a critical view of imposing traditional music curriculum values when designing learning and assessment for technology in music. It asks the question whether it can be more effective *not* to assume "what's best for them" regarding specific learning outcomes, but to prioritise creative decision-making as a means of promoting flexibility, communicating identity and critical thinking with technology.

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This article draws on a doctoral investigation into how DAW multimodality relates to identity-based pedagogical processes. In particular, it explores how music teachers might cater for the growing number of secondary school-aged learners who identify as digital musicians or producers but for whatever reason struggle with aspects of the current school music curriculum. The aim of the study was to gain insight into how such students perceive their own music education experience, how they learn to use DAWs outside the classroom and whether conventional music concepts (e.g., notation, polyrhythm, cadence etc.) can be studied within a DAW in a way that was more relevant to their own creative practice.

Of particular interest was whether autodidactic (self-teaching) habits of DAW users could be integrated into classroom learning in a way that was engaging and motivating using the lens of identity-based pedagogy.

## A critical perspective on music education technology

The need for newer pedagogical approaches to better accommodate technologically savvy students was raised as early as 2001, with Marc Prensky (2001) coining the now-ubiquitous term, "digital native". Prensky (2001), Tapscott (2008) and Howe and Strauss (2000) noted that a move from direct instruction to one of partnering between teacher and student was a necessary evolution in nurturing modern learners, who have freer access to information via technology.

Secondary and tertiary education have undergone many iterations and refinements since then, but in Aotearoa some core principles have become a mainstream, one of these being that teachers and classrooms are more open to the inclusion of newer technologies—a strategy in part due to the realisation that learners can be privy to technological breakthroughs in ways their teachers may not.

Despite technology playing a major role in how we teach, understanding *why* technology is important as a new means of expression is yet to be firmly embedded in our New Zealand achievement standards. Current music technology standards reflect a need for competence with DAW and notation software,[i] but the questions need to be asked: What do these students really need help with, and is this material really what they *need*? Young music students teach themselves much of the technical DAW processes through the usual online avenues, like YouTube (Walzer, 2020), but also prioritise learning technologies that allow them to be more expressive given their musical direction, often ignoring fundamentals if it means getting to the desired sound or effect sooner (enter plugin presets!). Another important issue to consider is whether our achievement standards serve this process, work alongside it, or perhaps against it, with the consequence that fewer DAW users see music as a worthwhile study pathway.

Critical pedagogy—a teaching approach embraced by the Brazilian philosopher Paulo Freire and theorised in his landmark publication *Pedagogy of the Oppressed* (Freire, 2007)—contends that students and teachers should think critically about education by questioning the ethical, social, community and cultural aspects around content and delivery. Specific strategies are embedded in such teaching, such as the identification of power imbalance in social and educational contexts. Critical pedagogy also demands that education should be transformative in that it should change a student's perception, while demonstrating how societal norms can be seemingly arbitrarily weighted to benefit or advance one social class more than the other (Shor, 2012).

With regard to music education, an aspect of the application of critical pedagogy is to "break down the barriers that exist between what students enjoy listening to outside the classroom and the music their teachers want them to learn" (Abrahams, 2005, p. 62). This way of learning, in theory, should illuminate the academic significance of the music they already know, and empower students to consider the musical experiences which occur outside the classroom as an opportunity to learn and develop musically.

With this in mind, another important goal of the research was to determine if, given the role of music in individual identity (Hargreaves et al., 2002), critical pedagogy might also empower students through the active study of their own identity—theoretically leading to a deeper understanding of their own aesthetic and ideals.

The impetus for discussing critical pedagogy here is twofold. Firstly, a music technology curriculum can run the risk of being disproportionately tailored to a type of music practice that follows traditions in nomenclature, sequential learning and teaching approaches. The second reason is that digital music-making and its autodidactic practice have played a part in determining a shift in educational demands from adolescent musicians and composers, which is not necessarily reflected in the way we teach. These potential issues are grounds for possible power imbalances in the teaching-learning process, and for the need for teachers to be more aware of issues of identity and modality as students learn with music technology.

The growing number of digital composers is a reflection of the state of the industry. Thanks to DAW accessibility, the younger musician who doesn't play an instrument but writes music with a computer is fast becoming a regular aspect of our music classrooms. These musicians may feel that the current curriculum is either unnecessary or irrelevant to their own artistic vision, and that focusing on technical fundamentals does little to develop the skills they value most: flexibility and musical versatility (Partti, 2014). In this context, critical pedagogy would inform a more equitable teaching design as well as provide a social and cultural context for students, while using individual expression to help situate their work.

Ten years on from the research of Prensky (2001) and others, Koutropoulos (2011) provided an important critical perspective on what it means to be a digital native and how effective subsequent teaching strategies were, pointing out that Prensky and others had made some ill-considered generalisations. The overarching theme of his critique was that digital natives are characteristically diverse and that there is a recurring assumption in Prensky (2001) and others that all digital natives have shared life experiences with regard to access to technology, non-sequential learning styles and had the ability to effectively multitask. If these reflections on defining the digital native group identity have told us anything, it is that redesigning any music technology teaching approach is fraught with difficulty, and therefore now more than ever the "one size fits all" approach is wearing thin.

Koutropoulos' critique is relevant today. While employing new technologies to better connect with digital natives has become a standard part of our teaching approach, "digital inequality" is still an unavoidable obstacle (Ignatow & Robinson, 2017) and factors such as adequate technical support, teacher/student digital competence, maintenance and training costs still characterise many classrooms (Rasheed et al., 2020).

## Equity of access in music education

Our own digitally-literate music students tend to begin and hone their craft through a combination of being self-taught via autodidactic practice and through enculturation (Green, 2008; Waldron, 2017). "Enculturation" denotes the process of a learner assimilating ideals and traditional content through situating themselves in specific environments. While this is well-established in the linear model of Western classical music education requiring a scaffolding of music fundamentals to access, we would argue that the culture of music-making with DAWs is different and therefore requires a unique approach. This chimes with David Elliott's praxial model of music education which seeks to address the social-contextual and practical impact of music:

> Music makers, listeners, and, therefore, musics have an enormous capacity to soak up, interact with, enfold, mould, modify, reconfigure, represent, communicate and heighten the effects of an unlimited range of non-sonic media, technologies, other musics and multiple art forms. Accordingly, music makers (amateur or professional, young or old and so forth) and their musical creations have the even broader and deeper potential to interpret cultural values and issues, including economic and political trends. (Elliott & Silverman, 2015, p. 86)

Modern styles and musical cultures are rich in these diverse contexts in ways that are perhaps more relevant to DAW users. This is especially pertinent in modern genres such as Hip Hop, where the music and its lyrical associations are generally thought of as a significant branch of mainstream Hip Hop culture. Due in part to its heavy emphasis on lived experience, Hip Hop has strong associations with specific political and social contexts and is a form of cultural capital for African-American youth (Clay,

2003; Powell, 1991; Rose, 1991). Some teachers already use the example of Hip Hop as a lens through which social identity can be discussed (Morrell & Duncan-Andrade, 2002). This kind of contextualisation can also be applied to DAW learning by examining the spaces of sharing, collaborating and promoting which DAW users frequent.

## Defining blended learning

The pedagogical concept of blended learning can also be reframed as an effective mode of DAW instruction. Despite the obstacles outlined by Koutropoulis (2011), remodelling to a blended approach could make for a more meaningful learning environment. Designing new teaching structures around digital natives has led to several key methods for learner success. Recent technologies offer ways to blend everyday digital experiences, such as online collaboration and video tutorials, with other classroom activities, such as class discussions, job allocation[ii] and group readings.[iii]

Blended learning has been established as the "new normal" in modern education (Dziuban et al., 2018). An early attempt at defining the term was made by Whitelock and Jelfs (2003), who described it as integrating traditional face-to-face learning with web-based approaches, such as self-paced instruction, virtual classrooms and streaming resources. Driscoll (2002) further suggested that blended learning can also include mixing or combining instructional technology with practical tasks "in order to create a harmonious effect of learning and working" (p. 1). He pointed out that blended learning means different things to different people, highlighting its potential as an evolving pedagogy.

Hrastinki (2019) acknowledges that there is still much ambiguity around the definition, noting that blended learning can currently be defined as "essentially all types of education that include some aspect of face-to-face learning and online learning" (p. 564). The lack of a universal definition means that there is potential for teachers to revert to a minimal set of guidelines—or "basic" blended learning—without exploring its full potential; a well-considered approach, however, can have real benefits in terms of relevance and longevity. Consequently, he stresses the need for any teacher who adopts the practice to have their own clear explanation of blended learning, and thus provide a good platform from which to begin to build their own approach to teaching with technology. To us, this advice gives the concept of blended learning real longevity; it encourages us to develop individual styles of blended learning while having the flexibility to try different approaches with new subjects—hence its application to this study.

## A snapshot of technology in the music classroom

Like other subjects, music education has undergone change as we move into the next era of ICT-based learning. The term "School 2.0" has been used to describe three main areas of consideration that contribute to this shift (Crawford, 2017; Gerstein 2013; Hargadon; 2015):

1. New technologies that allow an unprecedented level of collaboration and distance and online learning, along with increasing access to free and open-source software and other resources.
2. Changes in societal expectations along with what is considered valued knowledge and essential skills due to a transitioning economy.
3. An emerging culture that is more transparent, multidimensional and conducive to open discussion around all aspects of society and individual identity.

As a response, many music classrooms already utilise tools such as Musescore, Bandlab and Soundation. Some teachers go further by actively encouraging students to explore online databases or interactive applications (e.g., SoundExchange, learning music, aQWERTYon and MusicTheory.net, to name a few). As far as blended learning goes, this is real progress in that it affords real flexibility in the way we teach. Despite this, Crawford (2017) writes that there is still minimal uptake of pedagogical change in music education; and here, technology is being used "as a one-way information base, not an interactive information exchange for creative exploration and artistic expression" (p. 196).

Partti (2017) offered one way to incorporate new musical practices and technologies in our teaching. She first investigated two prevalent schools of thinking in music tech education before outlining a better-suited approach. The first, "pedagogical fundamentalism" (p. 258), values the consistency and dependability of formal textbooks and systems of learning while actively discouraging the use of certain technologies and modern contexts of music (e.g., videogame music), viewing them as a distraction and/or irrelevant. Conversely, what she calls pedagogical populism asserts the opposite, expanded on by Buckingham as "a kind of populist cyberlibertarianism, which claims that ordinary people will somehow be empowered by technology, and that digital media are inherently liberating and countercultural" (Buckingham, 2015, p. 291). While the latter is a more accurate portrayal of how technology is used outside of schools, this can be problematic in that it is not just highly dependent on teachers being digitally fluent, but also that they must maintain a constant awareness of current technological tools and methods.

The other issue is that the necessity to keep up with industry trends means that the nature of the learning becomes reactive and can run the risk of delegitimizing formal music education in that—from their perspective—the focus would be better spent on more current alternative learning resources (e.g., YouTube tutorials, etc.). Expecting a teacher to regularly do the same is of course unrealistic; the disproportionate effort required would only add to their responsibilities in organising learning contexts that cater for each student (Partti, 2017).

## Study design

As newer technologies become embedded in the everyday lives of adolescents, they are becoming connected to the world in a way that gives them the potential for incredible agency. However, it is also apparent that newer vocational pathways with technology are forming and becoming obsolete more quickly than any curriculum can hope to keep up with. This being the case, teachers should not just aim to tell students what they should know, but also to enable them to identify means and modes of expression through an evolving set of tools, and to adequately assess whether something is relevant or not to their own beliefs and commitments around aspired-to modes of expression.

An aim of this action research study was then to explore a methodology for achieving this, in which I (Tom, as principal researcher) designed a new kind of constructivist environment where learners were able to identify and address limitations they were unable to adequately understand through autodidactic practice alone. These were referred to as "blocks" during the analysis of the particular sessions that occurred during the intervention (see below) and were mostly terms and techniques associated with DAW practice but not actively outlined in current assessment documentation. The learning involved unpackaging the function of these blocks and collaboratively devising ways of exploring the workings of each as means of expression.

Using this method and drawing on identity-based and critical pedagogy thinking, two assumptions were made: firstly, that the learners were intrinsically motivated to engage with the material (as they had actively sought it out on their own); and secondly, that they required a third party (or critical companion) whose role was to contextualise the use of each block in a way that was relevant to their own music-making. The latter is possibly the clearest justification for face-to-face teaching in the current environment, in contrast to the monodirectional means (e.g., YouTube, FAQs etc) that serve as the main avenues of self-teaching for digital music-makers.

The study thus set out to investigate how the self-directed learning habits of DAW users might be integrated into classroom learning underpinned by constructivist approaches. The research questions were as follows:

1. Does current secondary school pedagogy advantage or disadvantage DAW specialists?
2. Do current secondary school teaching methods adequately take DAW-specific learning practices into account?
3. Can musical identity be more deeply embedded into secondary school curriculum?
4. What might be the effect of placing more emphasis on individual expression in music technology curriculum?

This article is focused on the findings specifically related to questions 2 and 4.

The study took place online via video conferencing software in March and November 2020 and involved me designing and implementing sessions that incorporated a new mode of blended learning (the intervention). In the first phase (March), he recruited six participants from the Hawke's Bay area and in the second extended the study to a nationwide pool of four participants. All participants were senior music students, either currently sitting or having recently passed NCEA standards in composition or live performance. The Phase 1 group consisted of two females and four males, and Phase 2, three males and one female. Their proficiency with DAW software ranged from elementary to fairly advanced.

Prior to the intervention, all participants reported that their own music departments adopted some version of pedagogical populism in order to accommodate those learners who perform and compose using DAWs. Despite this, they reported that there was little offered in the way of specialist guidance, and there was an expectation that they were able to find whatever extra instruction required via their own online autodidactic channels.

Each research phase used the following sequence:

1. A semi-structured pre-interview with each participant where they discussed their own experiences with digital music-making in the classroom.
2. Three practical workshops were delivered that explored Digital Audio Workstation (DAW) processes. Each involved my explanation and demonstration of DAW-specific techniques, following which the participants completed a composition exercise using the same technique. These were conducted individually in Phase 1 but in groups for Phase 2, where each participant had the option to present their work to the group before we concluded with a focus-group-style set of discussion points.
3. A semi-structured post-interview with each participant where they were asked to comment on how relevant the sessions were to their musicmaking practice.

The practical session was created using a constructivist approach. Students were encouraged to discuss their creative process and how they learn new techniques, as well as areas they felt they needed to know more about (blocks) as a way of enhancing their capacity to express themselves. Using blocks as a focus, there was a wide spectrum of topics suggested by the participants, ranging from compression and equalisation to effect automation. As the principal researcher, I directed a conversation around how the blocks could function both independently and by extending the qualities of existing audio. Talking points were demonstrated in real-time using Ableton Live,[iv] following which the participants independently explored how it could be applied in their own songs.

For example, while exploring equalising, each student recorded their own voice, created duplicates and then used an equaliser to boost or attenuate specific frequencies in the sample and change its musical function. The students learned through experimentation that filtering some frequencies meant the formant was lost and the sample could then be manipulated into a melodic or chordal instrument via a sampler. Likewise, with compression, the group explored the applications of sidechain compression, e.g., how it can give movement to arrhythmic parts or add cohesion in a mix, thus bringing brand new elements into their own songs.

The methods were often combined as a way of illustrating how a DAW can extend a sound or sample. This was especially pertinent when the conversation turned to uniqueness of tone and instrumentation, and the students applied this approach in their existing compositions with recordings of their own voices. It was interesting to note how the students chose to present their work to the group; they were usually reluctant at first, but were more open to it as they saw their co-participants take the same risk.

While a significant aim of the practical sessions was to explore this approach, this comprised only two of the ten total contact days in each phase of the study. The remaining group sessions also included DAW-based workshops with the addition of group discussion and were more geared towards the aforementioned set of overarching research questions. They included:

- exploring concepts of uniqueness in composition including using the voice,
- extrapolating wider functions of audio through sampling and audio manipulation,
- exploring DAW multimodality in extending compositional process,
- conversations around creative agency, and whether or not we prioritise it in our working, and
- exploring ethical sampling, and how a sample's original intent and subtext can translate to either support or undermine our own creative voice.

## Musical identity and the use of DAWs in the blended classroom

Data gathered during the interviews, workshops and focus groups suggested that current secondary school classroom environments either don't support the development of DAW proficiency, or do so but not in relation to the student's own creative voice. Some of the participants discussed struggling to feel relevant in the classroom environment, while others found that the lack of support for their "instrument of choice" meant that they were often disengaged in class, leading them to question the value of institutional music education prior to our sessions. This finding was particularly interesting when considered in the light of the critical pedagogy issues outlined above and the need to be aware of the contexts around student identity and DAW modality.

Another key finding was that the participants responded well to learning and exploring DAW multimodality when in relation to their own work; they placed emphasis on the ability to communicate important aspects of their identity through their music. They were accordingly hesitant to play their creations for the group until they felt it more closely represented what they had intended. However, once they had been guided through some exploration, many remarked that they felt more confident in sharing their music. Confidence was key here; not only did they feel the music better represented their unique voice, but they spoke about being a more confident musician, finally able to articulate their process—and critique that of others—with the terminology they hadn't understood up to that point.

## Discussion

### *Rethinking blended learning with DAWs*

Published research involving the subject of autodidactism in music is scarce or absent (Ennis, 2019; Walzer, 2021; Zendel & Alexander, 2020). In respect of digital musicianship, the lack of studies can be explained in realising how commonplace self-directed and self-motivated learning processes are in this mode of creating. Speaking personally, every digital musician I know began their music-making journey either by learning about the tools online or being shown the basics by a friend. Rather than using curriculum design that incorporates this as a stage in assessment, I posit the view that this process should be integrated into the actual construction of the learning design.

An examination of the New Zealand NCEA curriculum indicates a heavy focus on technical ability over standards that require the articulation of compositional concepts. Furthermore, there are specific music technology standards that require students to demonstrate skills they would never normally use in their outside musical practice.[v] Some participants talked about having to complete this task without ever really understanding its relevance to their own modes of expression. The risk here is the danger of technology becoming tokenistic in its classroom application, with no real critical thought being put into which tools are worth investing in both in relation to class time and money.

Partti's (2017) solution to this issue of tokenism in approaches to music technology is what she calls a "radical pedagogy". In this scenario, the teacher's role changes to being that of a *critical companion* with the goal of recognising opportunities for musical growth in students and utilising cooperative

engagement in the classroom as a way of nurturing it. This type of pedagogy allows for a new type of constructivism, in which the students' own exploration into how they express their identity through music provides the framework through which the learning material can (and should) be contextualised. Partti (2017) refers to Dewey's philosophy of the classroom being a community where students' own aspirations and creativity are supported, as opposed to a standardised curriculum where musical ideas are always learned through examining others' work—a radical pedagogy would presumably allow this.

Blended learning can be flexible enough to be applied to all three of Partti's (2017) pedagogical approaches. However, I argue that focusing merely on blended learning-related technology can at times distract from what should be our main goal—designing an engaging curriculum that develops learners into skilled, critical, self-reflective and socially responsible musicians. This can come about when the teaching emphasis becomes *how* to use technology, rather than *why* we should use it.

## Participatory culture and DAW

As teachers we typically prioritise developing cooperation, commitment and proficiency in our curriculum. However, justifying a course of study in music can also be problematic as these values occur readily in informal (outside-of-school) settings through the use of new technologies (Green, 2008). Online learners are able to circulate, appropriate, produce, archive and explore multiple avenues of expression in a way that is "unprecedented in both character and scale" (Gauntlett, 2011, p. 1). This is reflected in the rate at which the tools and nomenclature of digital music-making change. Therefore, music technology curriculum design should not be a sequential journey that is heavily reliant on technical proficiency, but rather a collaborative enquiry that focuses on recognising expressive potential in new tools and developing independent learning skills (Partti, 2017).

It is important to note that there are significant differences among students regarding the utilisation, rates of learning and access to technology that make a rigid curriculum problematic. One example of this is how learners interact with DAW programmes—particularly with regard to cost, popularity and how certain DAWs have become synonymous with the production of certain genres. The good news is that DAWs are becoming more alike to the point that soon the only real difference will be the appearance and workflow. Therefore, much of what can be investigated using a constructivist approach can be fairly easily translated to whichever DAW is the most accessible for one's students.

There is also the argument that technology should be viewed as a means of expressing identity, and therefore assessment should be based on this rather than technology being an end in itself (Pignato, 2017). While it is an attractive option to assess on technical ability alone, I would argue that assessing a learner's ability to *rationalise* using the tools can (and should) be the primary goal of curriculum design from the earliest stages of music education.

This study highlighted some key areas of consideration in secondary school music technology education in Aotearoa, particularly for students with some experience in DAW use and who strongly identify as digital composers. In particular, I believe that classroom learning would be more equitable if music teachers have (at least) a basic understanding of common digital composition concepts. Many participants in this study reported that the blocks they encountered were commonplace terms in their online circles (e.g., automation, compression, etc.), but that they had difficulty in contextualising them within their own music making. Despite this being a significant area requiring guidance, they felt that their music classroom wasn't the place to discuss it; they felt it was either too obscure or too far removed from the syllabus. For this reason, assessment needs to be flexible to accommodate these blocks. In addition, we need to recognise that in this regard there is a place for face-to-face teaching to complement autodidactic practice(s).

As discussed earlier, a heavy emphasis on technical skills does little to allow for the benefits of face-to-face teaching compared with autodidactic practice. This study highlighted the issue of terminology becoming out-of-date as newer techniques and technologies become relevant for students. This gives weight to the notion that assessment should focus on how students apply newer technologies to their own learning and creative output. Music Technology standards should place an emphasis on expression via technology and not just technical skills.

## Concluding thoughts

Teaching with this style of blended learning specifically applies Partti's (2017) critical companion principle, where a teacher guides the learner in critically reflecting on whether rapidly evolving music technologies apply to them and their creative processes. Framing DAWs' multimodal applicability in the context of expression rather than technical skills allows teachers to incorporate their own compositional ideals without losing sight of the student voice. It also negates the need for teachers to be consistently up with the play with specific techniques (many of which may become replaced in a few months' time) while allowing the student to suggest the tools, thus contributing to the constructivist environment.

The students in this study for the most part enjoyed learning music at school. They generally relished the freedom of being left alone to "do their music", particularly when it offered a respite from other study pressures. They were sympathetic to the technological demands for music teachers and the financial limitations around purchasing DAWs. Their issue, however, was engagement. When they expressed the wish to use software their teacher was unused to, the classes were described as defaulting to the aforementioned version of "basic" blended learning, where students' autodidactic practices were leaned on disproportionately.

For most participants in this study, the current curriculum was either not as relevant as they would have liked or was simply too easy in that it was assessing techniques basic in DAW use, such as sequencing or recording basic audio. This could be mitigated by assessment design that requires students to gauge their own level of ability and then understand how blocks can be used in a creative context. Assessment and learning design should be flexible enough to allow for changes in common terminology and encourage a critical view on how new tools can expand creative agency—not doing so runs the risk of alienating exactly the kind of student that the curriculum is hoping to support, that is learners who don't have ready access to instruments or tuition but love listening, talking and thinking music. Though they lack instruments, they have computers, and so are often drawn to DAWs by virtue of easy access and an open, engaging online community. These learners undeniably and unapologetically *identify as musicians*, and failure to recognise their needs does a disservice not only to them, but also to the future of music education.

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[i] See unit standards 32304: Operate a music sequencing application, and 32305: Operate a music notation application.

[ii] See the cloud-based project management tools Trello and Miro.

[iii] See Perusall.

[iv] Ableton Live is a popular Digital Audio Workstation.

[v] E.g., creating notated leadsheets.