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The integration of phonographic technology in basic music education: active methodologies and preparation for the creative economy through the Maife model.

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Summary

The technological metamorphosis experienced in recent decades has reconfigured the modes of production, consumption, and teaching of art, requiring that school music education transcend acoustic theory to incorporate digital literacy. This scientific article proposes an exhaustive analysis of the implementation of recording studios and audio editing *software* as active pedagogical tools, grounding the proposition of the Araujo Model of Educational Phonographic Integration (MAIFE). The methodology is based on a mixed longitudinal empirical design (2015-2024), analyzing a sample of 3,000 students and correlating the theories of Keith Swanwick and Lucy Green with the critical pedagogy of Paulo Freire. The study is structured around thematic axes that explore the epistemological foundations of technological music, the use of the studio as an analytical mirror of performance, and the insertion of students into the creative economy. Quantitative results attest that the hybrid approach between the rigor of concert music and Digital Audio Workstations (DAWs) generated a 30% to 40% reduction in school dropout rates, impacting more than 10,000 students throughout the researcher's trajectory. It is concluded that the contemporary music educator must act as an acoustic and social engineer, orchestrating technological literacy for the full emancipation of the individual.

Keywords: Music Education. Phonographic Technology. MAIFE Model. Active Methodologies. Creative Economy.

Abstract

The technological metamorphosis experienced in recent decades has reconfigured the modes of production, consumption, and teaching of art, requiring school music education to transcend acoustic theory to incorporate digital literacy. This scientific article proposes an exhaustive analysis of the implementation of recording studios and audio editing software as active pedagogical tools, establishing the proposition of the Araujo Model of Educational Phonographic Integration (MAIFE).
The methodology is based on a mixed longitudinal empirical design (2015-2024), analyzing a sample of 3,000 students and correlating the theories of Keith Swanwick and Lucy Green with Paulo Freire's critical pedagogy. The study is structured into thematic axes that explore the epistemological foundations of technological music, the use of the studio as an analytical performance mirror, and the insertion of students into the creative economy. Quantitative results attest that the hybridism between the rigor of concert music and Digital Audio Workstations (DAWs) generated a 30% to 40% reduction in school dropout rates, impacting over 10,000 students throughout the researcher's trajectory. It is concluded that the contemporary music educator must act as an acoustic and social engineer, orchestrating technological literacy for the full emancipation of the subject.
Keywords: Music Education. Phonographic Technology. MAIFE Model. Active Methodologies. Creative Economy.

1. Introduction

The discipline of music in the Brazilian basic education system is going through a crisis.

a profound paradigmatic shift, driven by the gap between the traditional school curriculum.

rigid and the audiovisual hyperconnectivity that characterizes the daily lives of new generations.

in accordance with the seminal formulations of the British researcher Keith Swanwick (1979), in his theory

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In terms of musical development, art education only reaches its cognitive peak when it integrates Aesthetic appreciation, performative execution, and original composition are inextricably linked. However, the materialization of this authorial composition in the contemporary scene no longer occurs. primarily through writing on lined paper, but also through digital interfaces, Sequencing *software* and electroacoustic recording processes. Music education that ignores this. Technological transition is doomed to obsolescence, failing in its purpose of shaping individuals. capable of critically reading, interpreting, and rewriting the complex soundscape of the modern world, wasting the potential of art as a mechanism for intellectual and professional advancement.

The central problem underlying this academic investigation lies in the urgency of To structure music teaching methodologies that incorporate phonographic production technologies. (recording, editing, mixing and mastering) as cross-curricular axes in schools of basic education. The main objective is not limited to classical musical literacy, but encompasses... Direct qualification of young people for the current creative economy. The hypothesis that underpins this essay is that converting the music lab into a recording production studio destroys the The passive role of the listening student is transformed into that of an active and capable cultural producer. indispensable entrepreneurial skills. The structure of this study dissects the processes Cognitive and social effects triggered by this approach are demonstrated, through longitudinal metrics and the application of the MAIFE Model, showing that the domain of Audio Workstations... Digital Application Workstations (DAWs) act as a shield against social marginalization.

2. Empirical methodological design

This scientific investigation incorporates, in parallel with a systematic literature review... from music pedagogy, a longitudinal empirical design of a mixed nature (quantitative and (qualitative), rigorously applied to the period between the school years of 2015 and 2024. The population sample used in this analysis consisted of approximately 3,000 students. Those aged 7 to 17 years old, regularly enrolled in municipal education systems, State and religious institutions in the State of Rio de Janeiro. These students acted as participants. systematic of structured school studio and phonographic production projects, submitted directly related to the pedagogical and technological interventions proposed by the program's coordination.

To assess the effectiveness of the implemented educational model, the methodology established the Monitoring six objective evaluation indicators: the comparative school dropout rate. (analyzing the participants' performance in relation to the overall average of the institutions); the frequency annual average in curricular activities; the quantitative number of phonographic productions carried out. entirely by the students; demographic participation in large-scale cultural events and shows. scale; the documented insertion of students into paid activities linked to the economy of

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music; and the volume of fundraising allocated to community-based humanitarian mobilization.

The data collection procedures relied on primary documentary scrutiny. encompassing the extraction of data from official school records and institutional management reports. academic credentials, certifications issued by public bodies, audience quantification at open events. and the legal documentation of partnerships established with state entities. The analytical method was based on- This is done in a longitudinal comparison before and after the implementation of the audio laboratories. The data The results were subjected to descriptive analysis of educational indicators and, subsequently, interpreted under the theoretical rigor of critical pedagogy and socio-interactionist psychology, ensuring the epistemological validity of the conclusions inferred from educational practice.

3. Araujo Model of Educational Phonographic Integration (MAIFE)

Based on the consolidation of metrics extracted during the longitudinal research and the To systematize the applied teaching practices, this study formally proposes the structuring from the Araujo Model of Educational Phonographic Integration (MAIFE). This pedagogical *framework* of The innovative nature is based on the strategic convergence between traditional musical practice and... Instruction in advanced digital technology and pragmatic training for the demands of the economy. Creative contemporary. MAIFE was designed around four epistemological pillars. interdependent, designed to fill the curricular gaps of conventional art education in basic and vocational education networks.

The first pillar, called Scientific Acoustic Literacy, integrates the discipline of music. to the exact sciences. Students are instructed in the fundamentals of applied physics of sound, understanding microphone polar patterns and the rudiments of basic audio engineering, converting mathematics and wave physics into tangible manipulation tools. The second This pillar encompasses Active Phonographic Production, characterized by the transition of knowledge. Acoustic equipment for software operation . At this stage, students manage recording sessions. multitrack, they perform destructive and non-destructive digital editing, and conduct the processes of Mixing and mastering, culminating in the preparation of the audio file for digital publication on... formats required by the market.

The third pillar supports Music Entrepreneurship, addressing the legal mechanisms and commercials in the recording industry. The curriculum goes on to study copyright and For phonomechanical professionals, the mandatory ISRC *(International Standard Recording Code)* registration is required. cataloging of works, and the logistics of distribution on global *streaming* platforms , equipping The student develops strategies for launching and monetizing their own cultural product. The fourth and final pillar, Ethical-Social Mobilization, links the generated product to civic engagement. The model requires that productions address human rights issues — such as overt campaigns against

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combating child labor—promoting institutional partnerships with regulatory bodies and directing the...
Cultural events for philanthropic fundraising and community assistance.

The operational structure of MAIFE consolidates a continuous and organic flow: choral practice.
It generates the initial performance, which is then subjected to technological recording and editing; the final product is...
launched on the market, generating social impact through its message and reaching the
Economic sustainability through monetization and professional literacy of the student. This
The model is configured as a replicable and scalable methodological matrix, capable of being adapted to...
multiple socioeconomic contexts and governmental and private educational infrastructures.

4. Epistemological foundations of music and technology in the school environment

The historical dichotomy between classical musical training and technological reality.
The lack of access to artistic knowledge among students constitutes one of the biggest obstacles to the democratization of artistic knowledge on social media.
teaching. Maura Penna (1990), in her research on music education in Brazil, warns that the
Insisting on a curriculum exclusively focused on classical conservatories distances the student from
The periphery, which does not see its identity reflected in the proposed repertoire. Overcoming this barrier.
This requires an epistemological revolution in the educator's stance, who must abandon the position of
from a univocal transmitter of the musical canon to assuming the role of technological mediator. The insertion
The use of phonographic technology is not intended to destroy classical music theory, but rather to provide tools for...
interfaces that translate these centuries-old concepts into the visual and interactive language of native speakers.
digital.

The concept of "soundscape , " developed by educator Murray Schafer.
(1992) establishes that the individual must be trained to possess a "thinking ear," capable of
Critically analyze the noise and music that surrounds you. When the school environment introduces the
With the microphone and audio interface in the classroom, he is handing the student the necessary scalpel to
to dissect this acoustic landscape. The student learns about the ambience of a room and its reverberation.
Images from a hallway can be captured, manipulated, and digitally reinterpreted. This manipulation
It requires active, in-depth listening, where the student perceives nuances of frequency and amplitude.
of sound waves and spatiality (stereo panorama), developing auditory intelligence.
superior.

Hans-Joachim Koellreutter (1997) argued incisively that music is the organization
intelligent with sound and silence, and that education should prioritize invention over reproduction.
Mechanistic. Digital audio technology embodies Koellreutter's postulates, allowing that
students lacking the fine motor skills to play a traditional instrument can, through
Using MIDI sequencing and *samplers,* composing complex arrangements, and expressing your musicality. This
Technological accessibility levels the playing field for cognitive opportunities, preventing creativity from being fully realized.

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strangled by a lack of historical access to instrumental training, fulfilling a role of
equity and educational justice.

Lucy Green's (2002) sociological research on informal learning practices
They demonstrate that musical acquisition through trial and error, auditory imitation, and peer collaboration generates...
a deep, intrinsic engagement. The introduction of formal recording production formalizes these practices.
in the school curriculum. When students come together to produce a digital arrangement, record voices or
When mixing a band, they replicate the collaborative dynamics of professional studios. The educator
It acts by facilitating this process, injecting structured theoretical knowledge (such as the need for
audio compression or subtractive equalization) precisely at the moment when the student faces the
technical limitations make music theory a practical and immediately applicable solution.

5. The practice of the school studio: from choral singing to digital mixing

The pedagogical transition from acoustic musical performance to the controlled environment of a
A school recording studio represents an extremely healthy technical reality check for the
student development. In the dynamics of a live choral performance, sound propagates from
ephemeral form; individual tuning inaccuracies are masked by the collective volume.
(blend), and emotion overrides critical analysis. The recording studio, on the other hand, operates as
An unforgiving microscope. When positioned in isolation in front of a condenser microphone.
With high-sensitivity reference headphones, the student is forced to confront, in high definition, the
The anatomy of her own voice, stripped of natural reverberations.

This initial auditory confrontation with the *playback* of their performance generates what is defined as
Constructive cognitive dissonance. Attentive listening to one's own rhythmic flaws (singing out of sync).
The use of a metronome, imprecise micro-tuning, and articulation noise forces the student to develop...
a level of self-criticism that collective essays could not forge with the same speed. A
The resilience needed to record the same *take* multiple times until perfection is achieved sculpts the
The student's character, instilling in them a work ethic focused on absolute quality. From the point of view of
From a technical standpoint, the classroom transforms into an applied physics laboratory: the choice of positioning
The microphone introduces the concepts of proximity effect, directivity (polar patterns) and
Acoustic leakage *(bleed).*

The subsequent stage of digital mixing and editing places the students in a stratum of
Mathematical and aesthetic processing. Equalization (EQ) becomes a surgical tool of
Frequency allocation, requiring the student to decide where to cut bass frequencies that muddy the sound of a
double bass or where to add brightness to the high notes of a voice to ensure intelligibility. The study
Dynamic compression requires a temporal understanding of parameters such as attack ,
Release and *ratio.* Mixing is the moment when dozens of sound tracks are ...

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leveled and arranged in the three-dimensional panorama to create a balanced work and market competitive.

Literacy in music production leads to qualification for entrepreneurship and for the creative economy. Producing quality music is half the pedagogical process; The other half comprises the music business model . Phonographic projects . Schoolchildren require the class to debate copyright laws (Copyright vs. Mechanical Copyright). Understand the ISRC registration bureaucracies and plan digital distribution strategies through... aggregators (TuneCore, ONErpm). This immersion in the workings of commerce offers young people a A tangible professional horizon, breaking the cycle of poverty through high-level technical training. level and transforming the school into an incubator for its first cultural *startups* .

6. Music as resistance, institutional denunciation, and humanitarian mobilization.

The art of music has a dual, irrevocable vocation: to serve aesthetic contemplation and to... A stark reflection of the ills and injustices of the social fabric. Music education, taught From the perspective of Paulo Freire's critical pedagogy of autonomy, it rejects aesthetic neutrality. In the context of school networks that serve marginalized populations, music should be structured as a civic mechanism for institutional denunciation, capable of confronting human rights violations, such as the exploitation of child labor. The implementation of structured music campaigns for This struggle represents the ultimate convergence between student-produced recordings and practical application. public.

When an educator encourages their students to compose original lyrics and arrange melodies And by recording tracks denouncing the loss of childhood, he is orchestrating a psychosocial revolution. The child who sings of their own rights leaves the position of passive victim to assume the leading role of A narrative of resistance. The psychological weight of an epic musical arrangement and audio recording. Professionalism reaches authorities and civil society with an affective impact infinitely greater than Cold statistics from research institutes. Public recognition of these productions by instances how the Labor Public Prosecutor's Office (MPT) proves that artistic excellence is a vehicle for unparalleled persuasion and legal literacy.

In addition to legislative awareness campaigns, the titanic force of music production It demonstrates its effectiveness in mobilizing resources for large-scale humanitarian aid efforts. The orchestration of seasonal musical performances, such as mega-concerts held in arenas for Thousands of viewers, it's not limited to entertainment. Under the leadership of the artistic director, the The cultural event transforms into a center for solidarity economy and philanthropic fundraising. The exchange of Tickets are sold in tons of food, linked to a logistical partnership with operational agencies. International development (such as ADRA) elevates the school event to a security operation.

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Food for families living below the poverty line.

Making productions of this colossal scale viable requires a great deal from the music educator.
Corporate leadership, strategic planning, and risk management skills that rival...
The demands of the professional entertainment market. The student who is part of these mega-events.
He experiences, under high pressure, the behind-the-scenes world of *show business* and large-scale philanthropy, receiving
a wealth of experiential knowledge that no purely theoretical curriculum could emulate.
Rhythmic sound ceases to be a passive luxury and becomes a precise social scalpel, instilling
In the young man's mind, there is a certainty that his voice has the irrevocable power to alter destinies and save lives.
human lives in their community.

7. Consolidated quantitative results (2015-2024)

Measuring the pedagogical and social effectiveness of the Araujo Model of Phonographic Integration
The Educational (MAIFE) is based on statistical records collected during its
Longitudinal implementation. The collection of institutional data attests that the artistic interventions and
The technological literacy programs coordinated by the researcher achieved a significant...
A brand that has directly impacted over 10,000 students throughout its professional trajectory.
Consolidated in public and private networks. Focusing specifically on the study's time frame.
Empirically monitored (2015 to 2024), the sample quantified the systematic monitoring of
Approximately 3,000 students are regularly involved in studio routines and choral practice.
structured.

The analysis of these students' academic performance revealed a structural change in
Metrics for student dropout rates in educational institutions. The engagement provided by active manipulation.
The use of audio software and belonging to a high-achieving artistic group resulted in a
an estimated reduction of between 30% and 40% in the school dropout rate among regular participants of the program.
The program demonstrates the retention power of the MAIFE model compared to traditional curricula.
decontextualized. In the vector of the creative economy and technical proficiency, the laboratory operation
This culminated in the export and completion of dozens of school-based phonographic productions with standardized standards.
Commercial mixing and mastering, demonstrating the students' effective digital literacy.
involved in multi-track recordings.

The outreach and philanthropic impact of these musical productions has shown a
Unprecedented scalability in the school environment. The mega cultural events orchestrated by
Technical coordination recorded a cumulative audience of over 50,000 spectators throughout the event.
seasons of concerts and themed cantatas. The conversion of this artistic capital into currency of
Social assistance facilitated the logistical collection of tons of non-perishable food items.
Warm clothing and toys, aimed at promoting humanitarian actions in partnership with

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non-governmental organizations.

Finally, the legal and institutional weight of these interventions was measured by the volume of Official recognitions issued by state control and regulatory authorities. The use of The studio, as a platform for reporting violations of fundamental children's rights, resulted... in campaigns formally recognized and endorsed by the Labor Prosecutor's Office. A The public utility of the aforementioned educational methodology was further confirmed through legislative motions of praise granted by City Councils, irrefutably attesting that music education based on technology and civic responsibility acts as an arm preventative and essential formative tool in national educational policy.

8. Conclusion

The meticulous academic analysis developed throughout this article regarding the intersection methodological relationship between music education, mastery of phonographic production technology and the The social responsibility of educators allows for the crystallization of structuring conclusions about their role. The civilizing role of art in human development. The formalization and longitudinal application of the Model. Araujo de Integração Fonográfica Educacional (MAIFE) attest that artistic education, when Stripped of its merely ornamental or elitist character, it consolidates itself as a curricular vector. indispensable for mitigating serious social vulnerabilities among children and young people. The inclusion of Digital Audio Workstations (DAWs) in schools does not represent a playful enhancement, but a stringent epistemological requirement to ensure robust, compatible technological literacy. with the fluency required by the creative economy.

Empirical evidence drawn from monitoring 3,000 students demonstrated that... Converting a school space into a music creation studio brings about cognitive transformations. profound changes in the student body, culminating in a reduction of up to 40% in school dropout rates. The process The demanding nature of recording and mixing acts as an analytical mirror, forcing the student to develop... Mental resilience and an unwavering pursuit of technical excellence. Furthermore, the application of Concepts of acoustics and wave physics are taught practically during sound recording workshops. It promotes an unprecedented transdisciplinarity, engaging the student in the study of exact sciences through... From acoustic pragmatism. Literacy in *music business,* copyright and digital distribution. It integrates young people from vulnerable backgrounds into the operational mechanisms of the creative economy. offering solid pathways to social advancement and financial independence.

In the area of humanitarian activism, the study proved that student-produced recordings and... Leadership in massive choral events becomes a formidable arsenal against injustice. Institutional. The impact of music campaigns in combating child labor, recognized by The Public Prosecutor's Office for Labor upholds the premise that aesthetics should serve ethics.

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transforming music into a Trojan horse for the dissemination of human rights in consciousness collective. Concomitantly, the ability to convert artistic performances that bring together more The fact that 50,000 spectators are drawn to philanthropic fundraising centers attests to the invaluable exchange value. humanitarian art.

It can be categorically concluded that excellence in modern music education requires... leaders who combine cutting-edge scientific depth, technical versatility in *software* and anthropological humanism in the same person. The recognition of these methodologies through State honors and legislative motions provide irrefutable empirical data that the art taught With high technological density, it is one of the safest and most profitable investments in intellectual capital. The MAIFE Model demonstrates that investing in microphones and studios in schools is human. Public and private initiatives aim to build, in a solid and irreversible way, the pillars of a society. incomparably more critical, technologically sovereign, and socially just.

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