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Guided exploration and musical application in a five-stage MELM : a mixed-methods case study of student engagement and learning achievement in music theory

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ABSTRACT

Music Theory instruction in higher education is still often delivered as the transmission of terms, symbols, and rules that are detached from musical experience, and Kolb's four-stage cycle does not specify how musical experience should be sequenced into theoretical concepts. To address this gap, this study modified the Musical Experiential Learning Model (MELM) into a five-stage instructional syntax Musical Experience, Musical Exploration, Musical Conceptualization, Musical Application, and Reflection and Musical Interpretation in which guided exploration and musical application are made explicit stages between experience and reflection. A convergent mixed-methods single-case study with an embedded non-equivalent control group pretest-posttest comparison was conducted with 50 Music Education students enrolled in a Music Theory course at a public university in Indonesia (two intact classes; MELM $n = 25$, control $n = 25$). Data were collected through expert validation, classroom observation, task assessment, practicality questionnaires, and pre- and post-tests, and were analysed with descriptive statistics, independent-samples t-tests, Cohen's d , and normalized gain (N-gain). Implementation of the five stages ranged from 92.50% to 96.25%, and student engagement/creativity ranged from 90.60% to 95.75%. Mean achievement in the MELM group rose from 64.92 to 90.72 (N-gain = 0.74), compared with 66.60 to 80.84 in the control group (N-gain = 0.43). The findings indicate that making exploration and application explicit stages helps students connect sound, concept, and practice, and shifts the lecturer's role from information provider to facilitator. Because the classes were not randomly assigned, group differences are interpreted as supporting evidence of association rather than definitive proof of causal effectiveness.



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Introduction

Music training on campus helps student artists develop the knowledge, skills, and professional attitudes, as well as creativity and aesthetic appreciation and reflectivity, necessary to become highly capable musicians. Music Theory instruction must not merely be considered as the memorization of terms, symbols, notation, and rules. Besides that capability, it is also essential for students to be able to synthesize theoretical knowledge with practical activities that include listening, singing, playing instrument, analysis, and creativity (Kokotsaki & Hallam, 2007; Perkins, 2013).

These characteristics show that a musical experience can form part of the learning process. The student-centred approaches, for example, give a place to the students' previous experience, musical activities, as well as the learners involved in knowledge-building (López-Íñiguez et al., 2022). Teachers' conceptions of learning also matter, because music education leaves room for such practices only when teachers regard experience-based learning as important (Bautista et al., 2010; López-Íñiguez & Pozo, 2014). Pedagogically, through the lens of experiential learning, we understand knowledge as emerging through the process of experience that is reflected upon and conceptualized (Kolb, 1984; Kolb & Kolb, 2005, 2017). The experiential learning cycle has been adapted, more or less, throughout the various disciplines in the higher educations (Healey & Jenkins, 2000; Yardley et al., 2012), and recent evidence shows that experiential learning increases students' motivation and classroom engagement (Kong, 2021). Experience-based learning in higher music education provides a platform for practical engagement to meet theoretical ones such as concepts, skills, reflections, analysis, and synthesis (Southcott, 2004). Also, studies on music agency have shown that music learning through one's lived experiential music life is the central way of understanding music education should take place (Georgii-Hemming & Westvall, 2010; Karlsen, 2011). Contemporary higher music education is likewise expected to prepare musicians who integrate disciplinary knowledge with creative practice in real contexts (Gaunt et al., 2021).

A pedagogical problem can occur if the teaching of Music Theory is predominantly based on conveying concepts and symbols without sufficient linkage to music experiences. In this case, students may consider theory to be a kind of detached knowledge with nothing to do with listening, playing, singing, creating, or analysing music. For example, Barbieri and Varvarigou (2025) stress on the necessity of relating learning theoretical ideas with composing, playing, singing, interacting, historical setting, and suitable repertoire. A similar issue has been addressed in the analyses of music theory instruction in universities (Attah et al., 2024) and in the design of course modules that combine writing music, performing, listening, and analysing (Davidson & Lupton, 2016). Huxtable (2022) further shows that music theory taught as an abstract, notation-centred code can operate as a barrier for students whose musical learning has been largely aural and practical, while recent attempts to restructure theory teaching through flipped and learner-centred designs remain mostly descriptive and rarely specify a stage-by-stage learning syntax (Barbieri & Varvarigou, 2025; Perakaki, 2025). Similarly to studies on aural skills and physically experienced musical know-how, there is a growing consensus that learning the theory of music will be more effective the better one is physically and mentally immersed in the sounds (Fournier et al., 2019; Juntunen & Hyvönen, 2004; van der Schyff et al., 2018). Hence, music-related experiences should not be considered just extra activities, but as important ways of understanding and applying music theories.

Ideally, Music Theory learning in higher education should begin from students' musical experience, move through guided discovery to formal concepts, and return to musical practice and reflection. In reality, as the studies above indicate, many Music Theory classes still start from definitions and symbols, so that students practise rules without first hearing, exploring, or applying them in music. Even though experiential learning is well backed by theories, it is not yet clear how musical experiences can be arranged in a systematic learning syntax for Music Theory in a way that makes the pedagogy fully articulated. Critiques of Kolb's model reveal that the four-stage cycle is not clearly specified as a guide for instructional sequencing and call for changes that reveal more clearly the relationships between experience and conceptualization (Bergsteiner et al., 2010; Morris, 2020; Seaman, 2008). This work is a follow-up to the first model of MELM which had four steps: Musical Experience, Musical Reflection, Musical Conceptualization, and Musical Experimentation. Later on, the model was changed so that it included five stages: Musical Experience, Musical Exploration, Musical Conceptualization, Musical Application, and Reflection and Musical Interpretation. The authors have added Musical Exploration and Musical Application mainly to help show learners the link among getting the experience, concept creation, application of a concept, and the reinterpretation of musical experience. The novelty of this study therefore lies not in experiential learning itself, but in a domain-specific instructional syntax for Music Theory that (a) separates guided exploration from conceptualization, (b) places musical application as an explicit test of understanding before reflection, (c) defines reflection as musical interpretation, and (d) states when learners should loop back to earlier stages. Empirically, the study reports implementation, engagement, task, practicality, and comparative achievement data that are needed to judge whether this syntax is workable in an actual course.

The study primarily focuses on modifying the pedagogical structure of MELM for Music Theory learning while recognizing that experiential learning in itself is not new. This modification highlights the processes of musical exploration and concept application that have to be completed explicitly before reflection and interpretation. On the conceptual level, the sequence of learning starts with students experiencing music, exploring various phenomena of music, conceptualizing their ideas, and then, applying the concepts in their musical activities. After this, they are led to reflection and interpretation. Such an educational model draws on evidence indicating active learning enhances students' performance (Freeman et al., 2014; Prince, 2004), even though students may underestimate how much they learn from active formats (Deslauriers et al., 2019), and it

is also aware of research pointing out that spontaneous discovery without guidance is not as effective as discoveries that come out of exploration combined with scaffolding and explicit instruction (Alfieri et al., 2011; de Jong et al., 2023; Hmelo-Silver et al., 2007; Kirschner et al., 2006; Mayer, 2004).

Accordingly, this study aims to (1) describe how the modified five-stage MELM was implemented in a Music Theory course; (2) measure the level of implementation, student engagement/creativity, and task performance across the five MELM stages; (3) determine the practicality of MELM from the students' perspective; (4) compare learning achievement gains between the MELM group and a control group that followed the course's regular instruction; and (5) derive pedagogical implications from these findings. The corresponding research questions are: (1) How is the modified five-stage MELM implemented in Music Theory learning? (2) What are the levels of implementation, student engagement/creativity, and task performance across the five stages? (3) How practical is MELM according to the students? (4) How do the learning achievement gains of the MELM group compare with those of the control group? and (5) What pedagogical implications follow from this implementation?

Method

This study used a convergent mixed-methods design (Creswell & Plano Clark, 2018) organised as a single-case study (Baxter & Jack, 2008; Yin, 2018) with an embedded non-equivalent control group pretest–posttest comparison. The case was the implementation of the modified five-stage MELM in one Music Theory course. The qualitative strand (classroom observation of how each stage was enacted) was used to answer how the model worked in a real class, which an experiment alone cannot show. The quantitative strand (implementation and engagement percentages, task scores, practicality ratings, and achievement tests) was added for two specific reasons: to check whether the observed processes were accompanied by measurable task performance and learning gains, and to compare those gains with a group that did not receive MELM. The two strands were collected in parallel and integrated at the interpretation stage by comparing observed stage-level processes with stage-level scores and group-level outcomes. Because the groups were intact classes rather than randomly assigned individuals, the comparison is treated as quasi-experimental supporting evidence, and causal claims are limited accordingly.

Participants were 50 undergraduate Music Education students enrolled in the Music Theory course at a public university in Indonesia. The course was offered in two intact parallel classes that had been formed by the study program before the study; therefore, total sampling of the enrolled students was used and individual random assignment was not possible. One class ($n = 25$) was taught with the modified five-stage Musical Experiential Learning Model (MELM), and the other class ($n = 25$) served as the control group and followed the course's regular instruction with the same course content and the same achievement test. Students were included if they were officially enrolled in the course and completed both the pre-test and the post-test; all 50 students met these criteria and were included in the analysis. The same 25 students in the MELM class provided the data for MELM tasks I–V, observation, and the practicality questionnaire. The sample size was fixed by course enrolment rather than by an a priori power analysis. A sensitivity analysis (two-tailed independent-samples t-test, $\alpha = .05$, power = .80) shows that with 25 students per group the comparison can reliably detect only large effects ($d \geq 0.81$); detecting a medium effect ($d = 0.50$) would require about 64 students per group. Students' names are not reported in order to protect their privacy.

Five instruments were used: (a) an observation sheet for the implementation of each MELM stage and for student engagement/creativity; (b) analytic rubrics for scoring student tasks in MELM I–V on a 0–100 scale; (c) a five-point Likert practicality questionnaire for students; (d) an individual practicality test score sheet; and (e) a Music Theory achievement test administered as pre-test and post-test to both groups. Content validity of the learning resources and instruments was judged by [number] expert validators using [validity index, e.g., Aiken's V], with values of [range]. Internal consistency of the practicality questionnaire was estimated with Cronbach's alpha ($\alpha = [\text{value}]$), and the reliability of the achievement test was estimated with [KR-20/Cronbach's alpha] (= [value]).

Data sources and collection techniques: 1) Observation of the implementation of the five MELM stages and of student engagement/creativity in MELM I–V; 2) Assessment of student tasks at each MELM stage; 3) Lecturer and student practicality questionnaires in the field trial, and; and 4) Pre-tests and post-tests in the control group and the MELM implementation group as supporting learning outcome data.

Data analysis techniques

Observation data were converted into implementation and engagement/creativity percentages for each stage (score obtained $\div$ maximum score $\times 100\%$). Task scores were summarised as stage means to describe developmental trends in students' performance across MELM I–V, and practicality questionnaire responses were

summarised as means and percentages. For learning outcomes, normality and homogeneity of variance were first checked with the Shapiro–Wilk and Levene tests. An independent-samples t-test was used to check the equivalence of the two groups at pre-test, and a second independent-samples t-test was used to compare gain scores (post-test minus pre-test) between groups; the Mann–Whitney U test was planned as the alternative if the assumptions were not met. Effect size was reported as Cohen's d, and class-average normalized gain was calculated as $N\text{-gain} = (\text{post-test} - \text{pre-test}) / (100 - \text{pre-test})$ (Hake, 1998). All tests used $\alpha = .05$ and were run in [software and version]. Because assignment to groups was not random, these statistics are interpreted as evidence of association rather than definitive causal effects.

Results and Discussions

The results are reported in the order of the research questions: first, the implemented structure of the five stages, based on classroom observation of the MELM class across five sessions (MELM I–V); then implementation and engagement data (Table 1), task scores (Table 2), practicality (Table 3), and the comparison of learning outcomes with the control group (Table 4). The discussion then positions the modified MELM against existing frameworks (Table 5).

Implementation structure of the modified five-stage MELM

The implementation of the five-stage revised Musical Experiential Learning Model (MELM) centers the musical experience of students as the learning initiation through which it is then gradually led into phases of exploration, conceptualization, application, reflection and interpretation. This learning framework was designed to bridge musical experience as an input to understanding concepts and to ability to apply in the context of music theory learning. As students are not only given to accept concepts in an abstract sense, rather they learn by the way of experience, observation, reflection on the same and application of the conceptual knowledge in musical activities.

The modified MELM has five phases: musical experience exploration conceptualization application reflection and interpretation. These five points together represent a learning cycle. Musical experience is not simply a starting point but is the main source of knowledge construction, i.e., the learners' own experiences become the foundation upon which the new knowledge is built. This constructed knowledge is then tested, reinterpreted, and re-experienced with the learners' musical experiences. This learning process is not passive.

This type of learning is only loosely a sequence of steps, and every step has some kind of relationship with the preceding and the subsequent one. So, the students can move backwards and forwards in the different stages according to their specific learning needs. Suppose a group of students find it very difficult at the application stage to bring music theory concepts to bear in the practical part. In that case, the learning process can revert back to the exploration stage where the students will be helped to find out which musical characteristics have not as yet been grasped, or the conceptualization stage, where students will go over how music experience and theoretical concepts are related. Similarly, what the students do after getting the results of their reflection and interpretation may inspire them to get into new activities or raise questions which will pave the way for them to start the following learning cycle. These return points are design rules of the model; the present data document implementation, engagement, and performance per stage (Tables 1 and 2), whereas the frequency of such returns was not recorded separately and is identified as a focus for future observation.

From these features, the modified five-stage MELM is basically an adaptive and flexible experience, understanding, application, reflection loop. The five-stage version allows students to acquire music theory knowledge in a hands-on way, through actual musical experience, while learning simultaneously to link theory with practice and meaning. The execution pattern of the modified five-stage MELM is diagrammed in Figure 1, and the actual classroom performance is in the Figure 2.

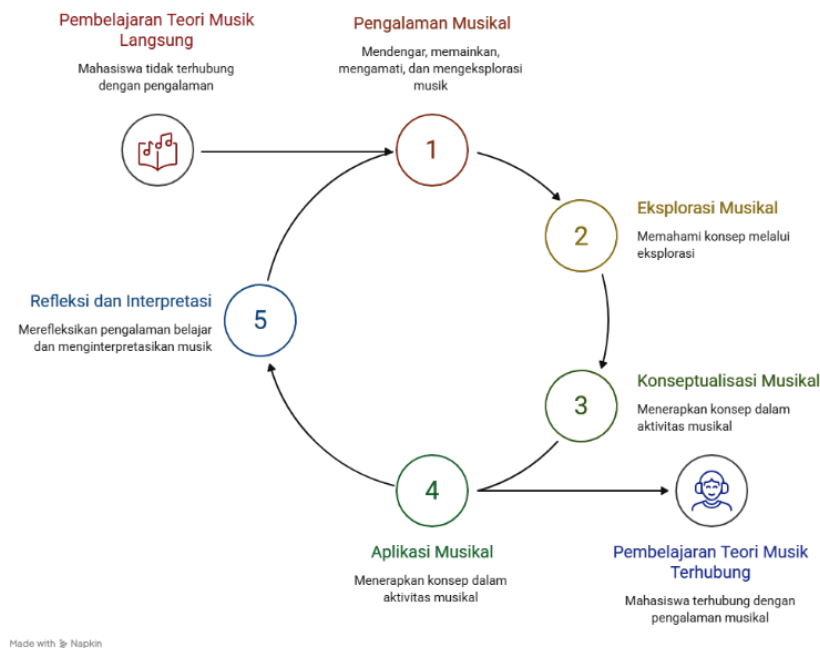


Figure 1. Learning flow of the modified five-stage Musical Experiential Learning Model (MELM)

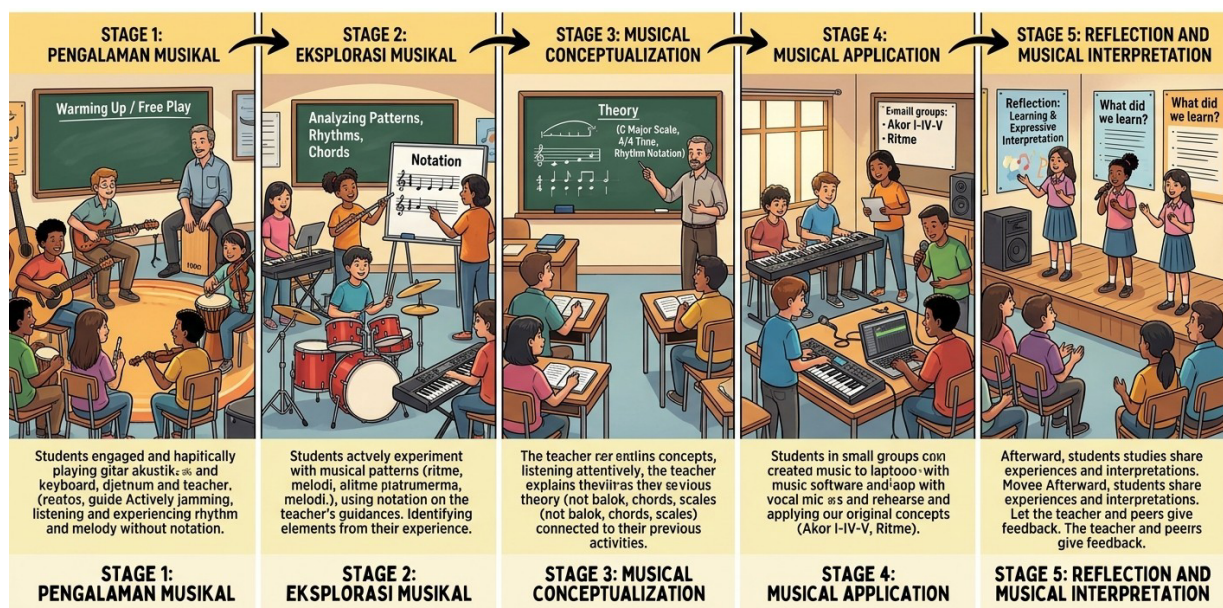


Figure 2. The modified five-stage MELM in practice

Stage 1: Musical Experience. Through activities such as listening, playing, singing or observing musical phenomena related to the content of the class, students acquire a tangible musical understanding. For instance, it might be the case when one starts getting familiar with the musical intervals through the experience of producing or perceiving two different pitches, while the concept of a chord can be revealed when someone listens to or plays multiple notes at the same time. In this phase, the student's ear perception and skills development are the foundations of knowledge prior to the exposure to theory or terminology, which will follow afterwards, as depicted in Figure 3.



Figure 3. Classroom activity in the Musical Experience stage

Stage 2: Musical Exploration. In this stage students discover music phenomena by trying, comparing, finding pattern, identifying, creating, and representing characteristics, variations, and findings through notation. In this role, the instructor merely asks guiding questions and gives stimuli that students follow up without being told the whole discovery process. This intermediate stage helps a learner gradually move from the experience with music to the understanding and forming of musical concepts (Figure 4).



Figure 4. Classroom activity in the Musical Exploration stage

Stage 3: Musical Conceptualization. The musical knowledge students acquired through the stage of experience and exploration is now linked with the language, symbols, principles, and rules of music theory. The teacher still provides support to the students' discoveries but mainly through clarification, explanation, and formalization. As such, students come to know the elements of music melody and harmony, chord progressions, and the arrangement of the whole composition via their relation to the experience they previously had (Figure 5).



Figure 5. Classroom activity in the Musical Conceptualization stage

Stage 4: Musical application. A stage where one is engaged in a real-life activity. Here the students take part in playing, singing, writing, analysing, composing, etc., and applying the learned concepts to musical examples. One of the functions of this activity is to test the understanding. Mistakes or challenges can be a catalyst for the students to go back to exploration or conceptualization, and thus learning is cyclic and adaptive (Figure 6).



Figure 6. Classroom activity in the Musical Application stage

Stage 5: Reflection and Musical Interpretation. In this stage, students think back upon their experiences, investigations, concepts and the ways they used what they learned in different situations. The activity of the reflection might include a discussion, answering the questions that help reflect, explaining orally, writing down the thoughts and giving a performance with a work. When it comes to the musical aspect of interpretation, reflection is not just a recalling of done things, but a capability of assigning a meaning to the music phenomenon that students can explain by the way they have been feeling and learning (Figure 7).



Figure 7. Classroom activity in the Reflection and Musical Interpretation stage

Implementation and student engagement

Table 1. Student engagement/creativity and implementation across the five MELM stages

Stage	Engagement/Creativity	Implementation
MELM I	90.60%	92.50%
MELM II	93.75%	92.50%
MELM III	91.60%	96.25%
MELM IV	93.75%	95.50%
MELM V	95.75%	96.25%
Mean	93.09%	94.60%

Source: Research observation data, 2026.

On average, across the five stages, students showed their engagement and creativity at 93.09% and the implementation of the model averaged at 94.60%. The data indicate quite a consistent level of implementation and students have remained almost invariably engaged throughout the various stages of teaching.

Development of MELM task scores

Table 2. Mean student task scores in MELM I–V

Stage	Mean task score
MELM I	83.00/100
MELM II	82.84/100
MELM III	85.72/100
MELM IV	86.20/100
MELM V	87.24/100

Source: Student task assessment data, 2026.

The mean task score has risen from 83.00 in the initial session MELM I to 87.24 in final session MELM V, with a slight dip in MELM II (82.84) followed by a steady increase in MELM III–V. Because MELM II corresponds to the Musical Exploration stage, the dip may indicate that working without ready-made definitions initially demanded adjustment from the students. These results present a trend which might indicate a descriptive improvement of the students work through their learning experience with the unit although an increase in scores only would not allow us to conclude a causal relationship without inferential analysis and the control for other possible factors.

Practicality of implementation

The field data indicate a student practicality rating average of 86.84% via questionnaire, together with a 5-point scale mean of 4.342. Students in class B had individual practicality ranges of 75 to 98 with an average of 86.72. These two pieces of data are kept separate because they are different kinds of evidence: a questionnaire about perception and usability test scores. The discrepancy in numbers is due to the fact that they come from different measuring instruments.

Table 3. Summary of MELM practicality

Data source	Mean score	Percent	Note
Field student questionnaire	4.342/5	86.84%	Perceived ease of use and usability
Class B practicality score	86.72/100	86.72%	Individual practicality test score

Source: Research practicality data, 2026.

Learning outcome data as supporting evidence

The learning outcome data reveal shifts in the means of both groups. The control group went up from 66.60 to 80.84 which was an increase of 14.24 points. The MELM implementation group rose from 64.92 to 90.72, which is a gain of 25.80 points. The difference of mean gain between the groups was 11.56 points. Initial equivalence was checked by comparing pre-test scores ($t(48) = [\text{value}]$, $p = [\text{value}]$), and the comparison of gain scores between groups yielded $t(48) = [\text{value}]$, $p = [\text{value}]$, Cohen's $d = [\text{value}]$. Expressed as class-average normalized gain, the MELM group reached N-gain = 0.74 (high category) and the control group N-gain = 0.43 (medium category) (Hake, 1998). Because the classes were intact and not randomly assigned, these results support, but do not prove, that MELM contributed to the larger gain; other factors such as class composition or lecturer effects cannot be fully excluded.

Table 4. Descriptive comparison of learning outcomes

Group	n	Pre-test	Post-test	Mean change
Control	25	66.60	80.84	+14.24
MELM implementation	25	64.92	90.72	+25.80
Difference in change				+11.56

Source: Research learning outcome data, 2026.

Musical experience as an entry point to theoretical knowledge

The actual implementation results indicate that the Musical Experience phase moves the beginning point of learning from definitions to experience. From an educational perspective, such change is significant as learners first meet soundphenomena or music-related activities followed by giving these things names and a conceptual understanding. As a result, theory is introduced to students not as independent symbols only, but as a picture of students' prior experience.

This result is in line with the experiential learning theory that places experience at the center of knowledge-building (Kolb, 1984). Music education, too, emphasizes an inseparable relation between experience, concepts, reflection, and even integrates all of these (Southcott, 2004). Research in embodied and informal approaches to music learning has equally revealed that a learner acquires musical elements more efficiently if first they are discovered via physical contact (movement, playing), and then hearing the music (Juntunen, 2020; Juntunen & Hyvönen, 2004; van der Schyff et al., 2018). The Music Theory field benefits significantly from MELM's ability to take such experiences and transform them into a set of clearly defined learning stages.

Musical exploration as a pedagogical bridge

The introduction of Musical Exploration is one of the major changes to the model. In the initial four-level model, it was possible to get through to reflection or conceptualization within a fairly short time. In the revised MELM, there is a separate phase of exploration where students can experiment, compare, and identify patterns before getting the conceptual definition. The data from observation indicate engagement/creativity at 90.60% in the introductory stage and at 95.75% in MELM V. Although the trend does not directly suggest an incremental boost due to the model, it indicates that giving opportunity to explore is compatible with high engagement level

among students. This result is consistent with the idea that (guided) discovery is more effective than unassisted discovery (Alfieri et al., 2011; Lazonder & Harmsen, 2016; Mayer, 2004), as well as with findings suggesting that exploration through interaction with peers helps promote autonomy in further education of music (Lebler, 2007, 2008). It is also consistent with evidence on productive failure, which shows that exploring a problem before receiving formal instruction can deepen conceptual understanding (Sinha & Kapur, 2021).

Musical conceptualization and theory–practice integration

In the conceptualization stage: The lecturer's role does not disappear here, rather it changes the main source of information to a person who leads and facilitates the process of formalization. The lecturer helps students bridge the gap between their experiences and exploration results with musical elements such as intervals, triads, inversions, transposition, progressions, and structure of a composition. This transformation is very similar to a research that studied the change music teaching from one-to-one and group teaching where it has shown that a teacher who changes from transmitting knowledge to facilitating knowledge opens much more space for student agency (Carey & Grant, 2015; Gaunt, 2008; Schiavio et al., 2019; Schiavio et al., 2020). From the point of view of the methods of teaching, the fact remains that for some, learning through guided instruction is the best way to achieve mastery of a subject, as argued and supported by their defenders (Kirschner et al., 2006; Sweller et al., 2019); however, this explanation is presented only after students have gone through the experiential phase where they could form the concrete representations that will eventually lead to understanding the abstract concepts. This sequencing is in line with recent arguments that inquiry and direct instruction are complementary rather than competing (de Jong et al., 2023).

Musical application as a test of understanding

The task assessment scores reveal an average of 83.00 in MELM I, an increase to 87.24 in MELM V. This trend may indicate that students were able to demonstrate higher and higher achievement levels in their completed tasks throughout the learning activities. From a teaching point of view, this stage lets the theory and understanding of music to be seen through music products or performances and not only through written responses. In this way, matching the learning activities and the assessment tasks embodies the idea of constructive alignment (Biggs, 1996) and the feedback during application is part of assessment for learning that helps to further guide learning (Black & Wiliam, 1998; Hattie & Timperley, 2007; Wisniewski et al., 2020).

Reflection and musical interpretation as the integration of meaning

Reflection is the stage that puts together experience, knowledge, and application again. Interpretation is the aspect that broadens the role of reflection. Students are not only required to report, they are expected, at the same time, to justify their decisions, give reasons for their choices, and associate meaning to their actions, which is one of musical meanings. This stage is of great importance to music theory learning since the theoretical ideas can be seen and used as something from which to describe the music and its elements instead of a set of notes, names, and formulas to be learned mechanically (memorized). In addition, structured reflection has been shown to promote the development of self-directed learning among music students (Carey et al., 2017, 2018), by doing so, they not only understand the learning process more but also control it. Making a reflection a visible, integral part of the critical reflection phase deals with some criticisms that suggest reflection is sometimes left just implicit in learning-cycle models (Seaman, 2008).

Positioning the modified MELM among existing frameworks

To clarify whether the modified MELM is a theoretical innovation or an instructional-design adaptation, it was compared with fifteen frameworks relevant to experiential, music-specific, and guided-discovery learning (Table 5). The comparison shows that MELM does not propose a new theory of learning; its theoretical base remains experiential learning theory (Kolb, 1984; Kolb & Kolb, 2017). Its contribution lies at the level of instructional syntax. Compared with Kolb's cycle and its revision (Morris, 2020), MELM specifies music-specific activities and explicit return points. Compared with Gordon's (2012) Music Learning Theory, which shares the sound-before-symbol principle, MELM is designed for tertiary Music Theory courses and adds explicit application and interpretive reflection stages. Compared with the generic 5E model (Bybee, 2014), MELM defines exploration and reflection in terms of listening, playing, singing, composing, and musical meaning-making.

Table 5. Comparison of the modified five-stage MELM with existing frameworks

Framework	Core sequence or principle	Experience–theory link	Position of the modified MELM
Experiential learning cycle (Kolb, 1984; Kolb & Kolb, 2017)	Concrete experience – reflective observation – abstract conceptualization – active experimentation	Experience precedes concepts; instructional sequencing not specified	Keeps experience as the entry point; adds guided exploration and explicit application

Framework	Core sequence or principle	Experience–theory link	Position of the modified MELM
Revised experiential learning model (Morris, 2020)	Contextualized experience – critical reflection – contextual conceptualization – pragmatic experimentation	Emphasizes context; generic across disciplines	Translates context into music-specific activities and return rules
Critiques of learning cycles (Bergsteiner et al., 2010; Seaman, 2008)	Reflection as continuous; stage models seen as underspecified	Questions linear stage models	Makes reflection a visible stage while allowing non-linear returns
Four-stage MELM (earlier version)	Musical experience – reflection – conceptualization – experimentation	Moves from experience to concepts quickly	Separates exploration and application as distinct stages
Music Learning Theory (Gordon, 2012)	Discrimination learning (aural/oral to symbolic association), then inference learning	Sound before symbol through audiation	Shares sound-before-symbol; targets tertiary theory and adds interpretive reflection
C(L)A(S)P model (Swanwick, 1979)	Composition, literature, audition, skills, performance	Balances musical activities; not a sequence	Places these activities within an ordered syntax
Dalcroze-inspired embodied learning (Juntunen, 2020; Juntunen & Hyvönen, 2004)	Movement and listening lead to musical understanding	Embodied experience grounds concepts	Uses embodied experience in Stage 1; adds formal conceptualization and application
Informal music learning (Folkestad, 2006; Green, 2006)	Learner-directed listening, copying, and playing with peers	Rich experience, minimal formal guidance	Keeps learner exploration but adds lecturer scaffolding
Praxial music education (Elliott & Silverman, 2015)	Music as action (musicing) in context	Understanding emerges from practice	Operationalizes praxis as application and interpretation stages
Peer learning in popular music (Lebler, 2007, 2008)	Self- and peer-assessment within music production	Reflection through peer feedback	Uses peer discussion in exploration and reflection
Guided discovery (Alfieri et al., 2011; Lazonder & Harmsen, 2016; Mayer, 2004)	Discovery supported by guidance	Unguided discovery is less effective	Exploration is explicitly guided by questions and stimuli
Productive failure (Sinha & Kapur, 2021)	Problem solving first, instruction afterwards	Initial struggle prepares conceptual learning	Exploration precedes conceptualization in a similar way
Combined inquiry and direct instruction (de Jong et al., 2023; Hmelo-Silver et al., 2007)	Inquiry phases integrated with explicit instruction	Inquiry and instruction are complementary	Conceptualization formalizes discoveries after inquiry
5E instructional model (Bybee, 2014)	Engage – explore – explain – elaborate – evaluate	Generic science sequence	Closest analogue; MELM is music-specific and ends with interpretive reflection
Flipped and learner-centred music theory designs (Barbieri & Varvarigou, 2025; Perakaki, 2025)	Pre-class content and in-class practice; learner-centred resources	Links practice and theory with little explicit syntax	Provides a stage-by-stage syntax that can be combined with such designs

Source: Authors' synthesis of the cited literature.

Pedagogical implications of the modified five-stage MELM

The pedagogical implications of the modified five-stage MELM suggest that music instruction should begin by exposing students to concrete musical stimuli or experiences before proceeding to symbolic formulations and theoretical concepts. Lecturers should provide open-ended learning opportunities through questions and activities that encourage students to compare, experiment, and discover musical patterns independently. Although theoretical explanations remain necessary, they should function as a means of helping students conceptualize and formalize their musical experiences rather than being regarded as the sole means of acquiring knowledge. Furthermore, assessment should integrate conceptual understanding with practical activities, allowing students to apply theoretical knowledge directly to musical practice. Reflection should also be incorporated as an important form of learning assessment through activities such as keeping diaries or reflective journals, participating in discussions, giving presentations, and orally defending their musical reasoning. In its implementation, the learning syntax should be treated flexibly, so that difficulties encountered during the application stage can provide opportunities for students to return to the exploration or conceptualization stages to strengthen their understanding. In addition, a three-book system consisting of a Student's Book, Lecturer's Book, and Teacher's Book can serve as a useful framework for maintaining alignment among learning objectives, instructional syntax, learning activities, and assessment. Overall, the modified five-stage MELM emphasizes the interconnected roles of musical experience, exploration, conceptualization, application, and reflection in developing students' meaningful understanding of music theory.

Limitations of the study

As to the article limitations, first, the comparison between the MELM and control groups used intact classes without random assignment, so selection effects, class composition, and lecturer effects cannot be ruled out, and the gain difference should not be read as definitive causal evidence.

Second, the sample was small and drawn from a single course at one institution, which limits statistical power (only large effects were detectable) and generalizability. Third, different product validities were performed using varying numbers of validators for specific criteria, so the validity results should be read together with the reported number of validators and calculation procedure. Fourth, the student-experience dimension of the case study relied mainly on observation scores; interviews, student diaries, or field notes would allow student experience to be described in more depth, and the frequency of returns to earlier stages was not recorded.

Conclusions

The modified five-stage Musical Experiential Learning Model (MELM) is best understood as an instructional-design adaptation of experiential learning theory rather than a new learning theory: it structures Music Theory learning into Musical Experience, Musical Exploration, Musical Conceptualization, Musical Application, and Reflection and Musical Interpretation, with explicit rules for returning to earlier stages. In a convergent mixed-methods case study with an embedded non-equivalent control group, the learning resources were rated valid by expert validators, implementation of the stages ranged from 92.50% to 96.25%, student engagement/creativity ranged from 90.60% to 95.75%, the mean task score increased from 83.00 in MELM I to 87.24 in MELM V, and student-rated practicality was 86.84%. The MELM group's achievement rose from 64.92 to 90.72 (N-gain = 0.74), compared with 66.60 to 80.84 (N-gain = 0.43) in the control group. These results indicate that MELM is workable and practical in an actual Music Theory course and is associated with higher achievement gains; however, because the classes were not randomly assigned and the sample was small, they do not establish causal effectiveness, and MELM should not yet be regarded as a model whose effectiveness has been validated. The main pedagogical implications are to begin with musical experience, provide guided exploration, formalize discoveries through conceptualization, test understanding through musical application, and close the cycle with reflection and interpretation. Future research should use larger, randomized or multi-site designs, record how often learners return to earlier stages, and combine inferential analysis with interviews and reflective journals to examine the pedagogical value of the model in more depth.

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