

The analysis of music composition learning of HL Music diploma program students in the international baccalaureate curriculum using Jean Piaget's theory of cognitive development



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ABSTRACT

This study uses a qualitative case study method with three HL music students in the International Baccalaureate (IB) Diploma Programme. It aims to analyze the creative process of students who selected HL music out of interest but lacked prior musical theory or skills. The focus is on the Contemporary Music Maker HL Only assessment, where students produce a music composition. The composition process is analyzed using Jean Piaget's cognitive theory, particularly the stages of assimilation (integrating prior knowledge), accommodation (adapting to new knowledge), and equilibrium (balancing the two). The findings show that Piaget's cognitive stages effectively guide students through the creative process. The quality of equilibrium each student achieves is reflected in their IB scores, demonstrating their ability to integrate and apply new knowledge. This study underscores the relevance of Piaget's cognitive theory as a foundation for developing creative skills in music education. It highlights the importance of understanding cognitive stages to support student learning in music composition. Further research is recommended to explore its application across different educational levels and cultural contexts.

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1. Introduction

Learning the arts, including music, is vital in comprehensive development. The International Baccalaureate (IB) curriculum is particularly significant internationally because it focuses on critical thinking, creativity, and a global perspective [1]. The IB curriculum includes stages such as the Primary Years Program (ages 3-12) and the Middle Years Program (ages 11-16). The Diploma Program, for high school students includes distinctive components like Theory of Knowledge (TOK), Extended Essay (EE), and Creativity, Activity, and Service (CAS). The final stage, the Career-related Program, allows students to choose subjects related to their future studies. According to data collected by the IB Organization, since 2017, many schools have registered to become IB institutions. While the Primary and Middle Years Programs have been growing year by year, the most popular program is the Diploma Program. The IB curriculum allows students to choose six subjects, three at the Higher Level (HL) and three at the Standard Level (SL). This study was conducted at Pradita Dirgantara High School in Central Java, Indonesia, a private school implementing the IB Diploma Program. This school is free to develop and administer its curriculum. The Diploma Program is undertaken by students aged 16-19 years [2]. In the 2022/2023 academic year, students enrolled in IB Music at Pradita Dirgantara High School chose the subject primarily out of personal interest, without knowing the specific content they would study, such as music theory. Music theory should also be a logical pursuit.

By "logical," we mean that theory clarifies, explains, and enhances the understanding of music without involving anything mysterious [3].

Further notes that music theory examines key components of a musical work, including notation, key signatures, time signatures, and chord progressions. In addition, HL music students do not come from the Primary and Middle Years Programs in the IB curriculum [4]. Based on this background, the process students undergo in tackling the various music assessments in this curriculum becomes an intriguing research subject. The compositions produced by HL music students are shaped by their musical backgrounds, starting from their prior knowledge, which is then combined with new knowledge. Students process this knowledge to complete the music assessments outlined in the curriculum successfully. Given that the implementation of affective domain development in Indonesia remains underdeveloped [5], exploring and comparing the development of the affective domain within music education in the International Baccalaureate (IB) context provides valuable insights. The IB program, particularly in music composition, emphasizes reflective and creative processes, which align with the goals of fostering ethical values and personal growth. These insights could serve as a framework for enhancing affective domain development in Indonesia, especially in schools with diverse student populations representing various cultural backgrounds, such as those involved in my research.

The assessment criteria in the IB curriculum, especially in music, guide students to think and act like real musicians. Music composition, for example, starts with imitation, followed by experimentation, and culminates in performance. As a result, the adaptation process requires support from teachers to map out appropriate materials and exercises to prepare students for the IB music content [6]. According to Piaget (1951), the learning process occurs in stages: assimilation (prior knowledge), accommodation (new knowledge), and equilibration (balancing). Recognized as a pioneer in 20th-century psychology, Piaget's impact extends to education, notably influencing the International Baccalaureate (IB) curriculum, founded in Geneva in 1968. In 1920, Piaget joined Binet's laboratory in Paris, focusing on reasoning tests and realizing that children of different ages employ distinct thinking processes. This insight influenced his groundbreaking work on children's cognitive development stages. In 1921, he became the research director at the Jean-Jacques Rousseau Institute in Geneva, deepening his understanding of children's thinking through research on his children [7].

2. Method

This research is a qualitative study using a case study approach. Case study research involves a detailed investigation of phenomena within their specific context, often with data collected over time. The purpose is to analyze the context and processes to illuminate the theoretical issues being examined [8]. Case study methodology includes defining a single case or multiple similar cases, then exploring existing resources such as literature, media, and reports to understand the case and shape research questions. According to [9], a case study is a qualitative research approach that involves an in-depth exploration of a single case or multiple cases within a real-life context. This approach is used to understand complex phenomena by focusing on specific boundaries, such as individuals, groups, or programs. Data is typically qualitative, and analysis is conducted within individuals and across cases in multiple-case studies. Themes emerge from this analysis, leading to conclusions about the overall case, referred to as the quintain [10]. This study's initial steps include defining the case, reviewing the literature, and examining IB curriculum documents to formulate research questions. Qualitative data, such as classroom observations, portfolio analysis, and interviews, are used to understand the learning process of HL students.

3. Results and Discussion

All new students who enroll in the 10th grade at Pradita Dirgantara High School undergo an Orientation Period, similar to other schools. However, the duration is relatively long, lasting three months. This school applies a quarterly semester system, meaning students take semester exams every three months. During these three months, before students begin the IB curriculum, they focus on the national curriculum set by the Indonesian Ministry of Education. Everyone

studies all subjects mandated for high school students. Materials related to the "Merdeka Curriculum" are also implemented by all teachers at Pradita Dirgantara High School. This is mandatory and applied to generate report card grades under the national curriculum. All the prepared materials are designed as teaching modules and Learning Trajectory Plans, following the Merdeka Curriculum guidelines. For the music subject, which is categorized under arts and culture or arts and crafts, the materials taught primarily focus on traditional music during the 10th grade. However, the three-month period cannot cover all the content from grades 10 to 12. Students interested in exploring music can choose the IB curriculum's music subject at the higher (HL) or standard (SL) level. This article specifically focuses on students who take music at the higher level (HL), analyzing their learning processes, challenges, and achievements within the IB curriculum framework.

3.1. Results

The three students in this research come from diverse backgrounds, each with unique characteristics. However, one similarity is that none of the four students attended middle schools that used the IB curriculum. When they first took music in their initial semester, none understood what they would study. The students admitted that they had not researched the curriculum, particularly the music subject. HL Student A (the first HL student) expressed that IB music was an unpopular subject because it required music exploration—something they had never done before, especially in the arts and culture classes they had taken. Meanwhile, HL Student B (the second HL student) stated that IB music is a subject with a highly complex and diverse range of external assessments.

3.1.1. description of the case

Students in the HL music program at Pradita Dirgantara High School who come from schools that did not offer an international curriculum face significant challenges in adapting to the demands of the IB Music curriculum. Music theory is the universal language that underpins all forms of music, providing a system for understanding the relationship between pitch, harmony, rhythm, and melodic structure. This theory allows students to explore how these elements work together coherently in music composition [11]. Many of these students have only basic or limited prior knowledge of music theory, making it difficult to fully understand the complex concepts and expectations set by the IB curriculum. Music theory provides—a framework for analyzing and creating music [12]. As a result, they must put in extra effort to bridge the gap between their existing knowledge and the new material they are expected to learn. This lack of foundational knowledge means they must work closely with their teachers to understand both theoretical concepts and practical applications in music, especially in composition and performance. Moreover, the teachers themselves are also navigating unfamiliar territory. They are teaching IB Music for the first time, adding a layer of complexity to the learning process. They must familiarize themselves with the intricacies of the IB curriculum, including the specific assessment criteria, the Areas of Inquiry, and the unique approach to music education that the IB promotes. As a result, the learning environment becomes one of shared discovery, where both students and teachers are engaged in a collaborative process of learning and adaptation. This first-time experience for both students and teachers creates a dynamic where continuous dialogue and feedback are essential for overcoming challenges.

The language barrier further complicates the students' adaptation process, as much of the syllabus and resources are in English, which many of them are still in the process of mastering. Additionally, the structured daily schedule in the boarding school environment leaves them with limited time to fully engage with the material, further increasing the pressure on both students and teachers to make the most of their available time. Time management is crucial in boarding schools, as students often face a variety of academic and personal responsibilities. Effective time management has been shown to influence academic achievement positively. Studies indicate that students who plan their time well, manage their study hours, and engage in both short- and long-term planning are likelier to achieve higher grades. For instance, students with better time management skills can prioritize tasks, avoid procrastination, and maintain a healthy study-life balance, leading to better academic performance [13]. In conclusion, the situation at Pradita Dirgantara High School highlights the importance of collaboration, patience, and flexibility in overcoming the challenges faced by students and

teachers encountering the IB Music curriculum for the first time. The combination of limited prior knowledge, new terminology, a new teaching context, and the demands of the IB system requires both students and teachers to work together closely to navigate the complexities of the curriculum. Despite the difficulties, the shared experience of learning and adapting to the IB Music program offers a unique opportunity for growth and development for both students and educators.

3.1.2. Literature about the Music HL Diploma Program

The International Baccalaureate (IB) is the longest-standing, most recognized, and widely implemented international education program. Its most established and well-known curriculum is the Diploma Programme (DP) [14]. Introduced in 1968, the DP positions itself as the premier international pre-university curriculum." Music was introduced as a whole subject in 1979, and its popularity has continued to rise. Due to the IB's global reach and influence, the IBDP Music program represents a significant model of international music education[15]. The Diploma Program (DP) is a rigorous pre-university course designed for students aged 16 to 19, intending to develop knowledge, curiosity, compassion, and an appreciation for intercultural differences. It promotes open-mindedness and the ability to assess various perspectives critically. The DP curriculum spans six academic areas, encouraging students to explore multiple disciplines simultaneously. Typically, students study two modern languages (or one modern and one classical), social science, experimental sciences, mathematics, and creative art. This comprehensive approach effectively prepares students for higher education. The second aspect of the affective domain relates to the development of character and moral values [16]. This identified two key themes in music education. The first theme focuses on the influence of music education within the discipline itself, while the second explores its broader impact, particularly on shaping students' character. This dual focus is evident in the context of the International Baccalaureate (IB) music program[17]. The program cultivates technical and theoretical expertise and emphasizes personal growth, fostering ethical values and self-awareness through the creative and reflective processes inherent in music composition and performance [18].

Students select one subject from each area but can replace the arts subject with another option from a different field. They study three to four subjects at the Higher Level (HL) and the rest at the Standard Level (SL). HL subjects require 240 teaching hours and offer deeper content, while SL subjects require 140 teaching hours. Both levels focus on building critical thinking and analytical skills. At the end of the program, external assessments are conducted to evaluate students' competencies. Pradita Dirgantara High School officially became an IB World School offering the Diploma Program in 2022, following its status as a candidate school in 2021. Students who select Group 6 typically have a strong interest and passion for the arts. Among the subjects offered in this group is music, which is designed to (1) Explore diverse musical contexts and establish connections between various practices, conventions, and forms of musical expression; (2) Develop and experiment with musical skills through a variety of practices, conventions, and expressive forms, both individually and collaboratively; (3) Critically evaluate and refine perspectives on their own musical works and those of others. Students assume roles in the IB Music course as researchers, creators, and performers. The syllabus for IB Music is outlined in Fig. 1. In Fig. 1, there are three essential components: exploring music, experimenting with music, and presenting music. These three components must be implemented by students taking HL and SL. However, one additional mandatory component must be carried out by students taking HL: The Contemporary Music Maker (HL only).

- Exploring music: This component will encourage students to learn how to interact with various types of music, which will broaden their musical horizons and provide stimulation to expand their music-making. Students will demonstrate the diversity and breadth of their explorations by engaging with music from areas of inquiry in personal, local, and global contexts.
- Experimenting with music: While experimenting with music, students connect theoretical studies with practical work and gain a deeper understanding of the music they participate in. Through theoretical and practical work as researchers, composers, and performers,

students will learn to experiment with various musical materials and stimuli from areas of inquiry in local and global contexts.

- **Presenting music:** When presenting music, students learn to practice and prepare finished works to be performed or given to an audience. In pursuing a complete musical work, students expand their musical identity, demonstrate their musical ability, and learn to share and communicate their music as researchers, creators, and performers.

Contemporary music: Music at the higher level (HL) builds on learning musical competencies and challenges students to engage with the musical process in a contemporary music-making environment. For the HL component, students plan and collaboratively create a project that draws on competencies, skills, and methods in all musical roles in the music course and is inspired by real-life music-making practices. Based on data at the Diploma Program level, researchers in this article tried to conduct joint interviews with three students taking the diploma program at Boyolali Regional School, who are currently in their second year. Each answer from the interviewee was analyzed using Jean Piaget's theory.

Syllabus component
Exploring music in context When exploring music in context, students will learn how to engage with a diverse range of music that will broaden their musical horizons and provide stimuli to expand their own music-making. Students will demonstrate diversity and breadth in their exploration by engaging with music from the areas of inquiry in personal, local and global contexts .
Experimenting with music When experimenting with music, students connect theoretical studies to practical work and gain a deeper understanding of the music they engage with. Through this theoretical and practical work as researchers, creators and performers , students will learn to experiment with a range of musical material and stimuli from the areas of inquiry across local and global contexts.
Presenting music When presenting music, students learn to practise and prepare finished pieces that will be performed or presented to an audience. In working towards completed musical works, students expand their musical identity, demonstrate their level of musicianship, and learn to share and communicate their music as researchers, creators and performers .
The contemporary music maker (HL only) Music at higher level (HL) builds on the learning of musical competencies and challenges students to engage with the musical processes in settings of contemporary music-making. For the HL component, students plan and collaboratively create a project that draws on the competencies, skills and processes in all of the musical roles of the music course, and is inspired by real-life practices of music-making.

Fig 1. Diploma Program Music Assessment

3.1.3. description of the music composition

In the Netherlands and France, the selection of songs for developing students' emotional abilities focused on pieces capable of evoking deep feelings, often composed in a minor key. For example, in France, the song *Sans Verser De Larmes* was utilized to engage students emotionally [19]. This approach highlights the role of emotional resonance in music education, particularly in fostering affective engagement. In analyzing music composition, such choices emphasize the importance of tonal and emotional elements in shaping a student's creative process [20]. By incorporating compositions that evoke specific emotional responses, music education—such as in the International Baccalaureate curriculum—can encourage students to reflect on the emotional impact of their works, deepening their understanding of the relationship between technical composition and affective expression [21]. In this study, the research focus is on the musical compositions created by the students. They have to work together with others, from art or other subjects. Informal groups contribute significantly to developing practical compositional skills as students learn to combine technical proficiency with creative exploration [22]. Group composing helps foster individual creativity, leadership, and teamwork, which is essential for composing music effectively [23]. It was concluded that conceptualizing the teaching of composition as problem-solving enables music educators to address the specific


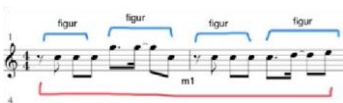

demands of the curriculum context in which they work while offering students a structured framework for cognitive development in composition [24]. Based on the students' backgrounds and references, each student produced unique results, as summarized in [Table 1](#).

Tabel 1. Music Composition Reference

Student	Music Composition	
	<i>The vision of music composition</i>	<i>Reference</i>
Student HL A	Music LOFI to make visual and musical elements work together	music LOFI
Student HL B	Performing a musical drama of the folk for adaptation "Si Pitung" by exploring the musical genre of tradition and composing the musical orchestration into piano.	DPR Musical SkinnyIndonesia24
Student HL C	Developing musicality in composing skills, especially in modern music, by collaborating with electronic music and guitar instrument	Mother Earth Wuauquikuna

After the students have completed their compositions, they will be summarized in [Table 2](#), which includes the following elements: (1) Song Form: sections of the song, such as verses or choruses; (2) Song Motif: melodies present in the musical phrase, elements that are repeated; (3) Rhythmic Pattern: duration of the melody from each musical phrase or the length of the notes.

Tabel 2. Analysis of music composition

Composition	Analysis of music composition	
	<i>Result</i>	<i>Evidence</i>
Song Form	Student HL A: Two-part song form Student HL B: One-part song form Student HL C: Two-part song form Student SL A: Two-part song form All works are the same in terms of repetition.	Examples of figures/rhythmic patterns that are commonly found throughout the compositions of HL/SL music students Example work: HL student B on presentation : 
		The same rhythmic Pattern is shown in the figure (blue markings) and altogether forms motif 1/m1 (red line).
Song motif		Differentiation between 2 motif motif 1/m1 
	All motifs in the students' compositions show incomplete motifs, with imbalanced motifs that still tend to be abstract.	motif2/m2  There is a clear imbalance, as shown by the number of measures: motif 1 consists of 2 measures, while motif 2 consists of only one measure, which

Composition	Analysis of music composition	
	Result	Evidence
Rhythmic Pattern	The rhythmic Pattern uses time signatures of 4/4 and 3/4. In the 4/4 time signature, there are four notes with a value of L in each measure, while in the 3/4 time signature, there are three notes with a value of L in each measure.	results in an incomplete musical phrase.
		Example of the composition: "A Flat Day" uses a 4/4 time signature.
		Example of the composition: "Saga of the Witch," which uses a 3/4 time signature.

The HL music students conducted external and internal assessments on July 5, 2024. The external assessment for SL and HL students was the presenting music course, while the contemporary music maker project served as the internal assessment exclusively for HL students. These assessments were submitted to the examiner, and the students received scores based on their performance. The highest score in this curriculum is 7, and the HL external assessment accounts for 30% of the final grade. Based on the results, HL Student B received the highest score with a moderate mark of 19, earning a Grade 4. This was followed by HL Student A, who received a moderated mark of 15 for a Grade 3, and HL Student C, who received a moderated mark of 12, also resulting in a Grade 3, see Fig 2.

International Baccalaureate				
Component results				
Session	MAY 2024			
School	062035 SMA Pradita Dirgantara			
MUSIC HL PRESENTING MUSIC in ENGLISH		Grade boundaries based on moderated mark		
		Grade	Minimum	Maximum
		1	0	5
		2	6	10
		3	11	16
		4	17	21
		5	22	27
		6	28	32
		7	33	38
		Raw mark	Moderated mark	Grade
062035 0068 (lcm147)	Siswa HLB		19	4
062035 0075 (lcm134)	Siswa HLA		15	3
062035 0064 (lcm143)	Siswa HLC		12	3

Fig 2. Scoring for presenting music from the HL IB music students in 2024

3.1.4. Description of the cognitive Jean Piaget's Theory

The Piaget Conferences explore their understanding of developmental changes across various areas and functions, summarizing current cognitive development theories [25]. Piaget emphasized that cognitive development is an active process where children construct knowledge through interactions with the environment rather than passively receiving information [26]. In the evolution of intellectual thought, Piaget highlighted three key elements: structure, content, and function [27]. (1) Structure, Piaget observed the functional interrelationships between children's physical actions, mental actions, and logical progress. Actions lead to operations, and operations give rise to the development of structures; (2) Content includes typical child behavior patterns that are reflected in responses to various problems or situations faced; (3) Function refers to how the organism achieves intellectual progress. For Piaget, intellectual development relies on two functions: organization, which

provides the organism's ability to arrange or organize physical or psychological processes into structured and interrelated systems, and adaptation, which is the adjustment to the environment through simulation and accommodation methods[28]. In this primer data, Jean Piaget divided children's cognitive abilities into four stages, namely [29]:

- Sensorimotor (0 – 2 years): In this first stage, children use their five senses to learn new things; apart from that, this stage will also be dominant in movement. Children will start to have reflex movements and high sensitivity, and they will not want an item replaced by another item that is not the same; they will be active with their thumbs and have very high mobility as they start to crawl and walk.
- Pre-operational (2 – 7 years): Children pay more attention to symbolic things in this stage. They will have actions to imitate someone with a high level of curiosity.
- Concrete Operation (7 – 11 years): After going through the two processes above, children will start to think using logic about activities they encounter every day.
- Operations Format (12 years – adult): This stage states that children think abstractly and always have deductive reasoning. Apart from that, as children become adults, their abstract thinking continues to develop, and they become scientific thinkers, starting to create an identity and character and continuing to develop morals to keep up with the times—stages of human intellectual development and skills. Fig. 3 is the stage of human intellectual development and skills.

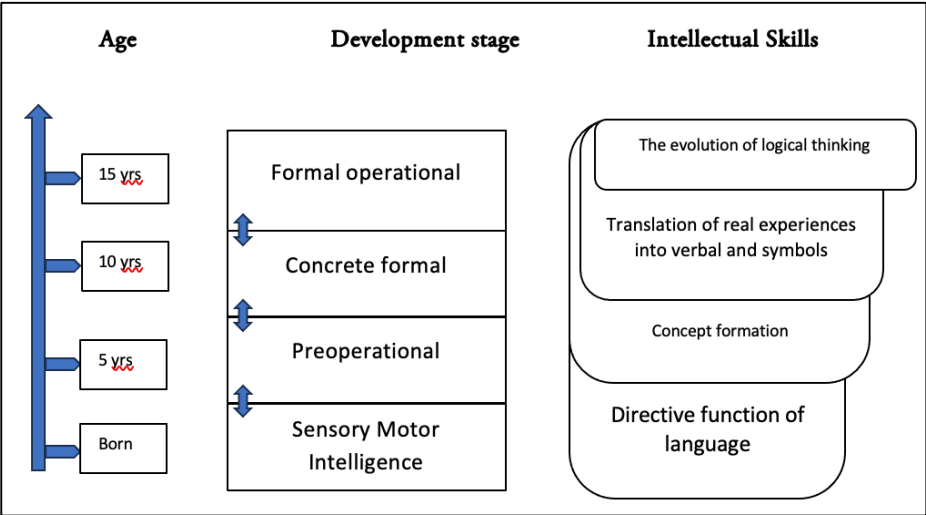


Fig 3. Piaget’s theory of cognitive development

The cognitive theory opinion expressed by Jean Piaget emphasizes a person's process or effort to optimize rational abilities (reason). This theory differs from behavioristic theory, which emphasizes aspects of individual behavior [30]. According to cognitive theorists, this means that humans have intellectual and rational abilities. Based on this research, here is the summary of the analysis that has been compiled in the following Table 3. :

Tabel 3. Jean Piaget Analysis

Jean Piaget Analysis		
Criteria	Jean Piaget's cognitive development	Description
A	Cognitive skills	The samples are in their formal operational phase (12 years old to adult). They begin to develop abstract thought, base their compositions on deductive reasoning (general to specific), develop scientific thinking, create identities and characters that influence their musical compositions, and start moral development.

Criteria	Jean Piaget Analysis	
	Jean Piaget's cognitive development	Description
Song motif	Adaptation	Findings:
		Passive adaptation (autoplastic): confirming the norms and values of society.
		Active adaptation (alloplastic): changing their environment based on their desires.

In Jean Piaget's cognitive process, students begin with assimilation (prior knowledge) [31]. During the assessment process in music composition, they adapt through accommodation, making various adjustments to reach their goals. Students endure challenges to achieve their own sense of equilibrium. However, this cannot be called a complete equilibrium because each student reaches their unique balance, which is reflected in the results they obtain from the IB assessment.

Tabel 4. Data Analyzing of Cognitive Process by Interviewee

Cognitive process	Data Analyzing	
	Jean Piaget's Cognitive Theory Operations Stage (12 – adult)	Interviewee Answer
Assimilation	The assimilation process, namely the process of integrating new information into cognitive structures that already exist in a child's mind [29]	- 16th years old (HL Student A): student came to know more about music and became familiar with software for making music
	Assimilation is a form of integration that assumes the existence of a mechanism or tool enabling data to be incorporated into the subject's cognitive structures [32].	- 16th year old (HL Student B), with new knowledge of music theory and collaboration skills. - 17th-year-old (HL Student C): As someone who enjoys composing songs, the depth, and execution of the songs she creates become more advanced after taking the music subject course. Especially in the playing of chords, modulation, and the beauty of the song's flow
Accommodation	Accommodation process, namely adjusting the structure to a new situation [29]	- 16th years old (HL Student A): students must know how deeply they need to understand the basics of music to take music lessons; they must also know the responsibilities that will be their responsibility in the future
	There is a duality where the subject integrates the object into their existing schemes while simultaneously adjusting those schemes to align with the unique characteristics of the object. Within this dual process, a balance between assimilation and accommodation is already present [32]	- 16th-year-old (HL Student B)): basic knowledge of music theory is really needed in this subject so that you don't experience difficulties in carrying out assessments, especially regarding exploring music assessment. - 17th years old (HL Student C) How to learn music is not just "I like singing." Seriousness, perseverance, and basic skills in playing music and theory are needed to survive in this subject. Specifically, Exploring music and

Cognitive process	Data Analyzing	
	Jean Piaget's Cognitive Theory Operations Stage (12 – adult)	Interviewee Answer
Equilibrium	The equilibrium process is a continuous adjustment between assimilation and accommodation. If the stage is successful, a balance of thought will be achieved. [29]	Presenting music is known in a complex way before choosing.
		- 16th years old (HL Student A): So far, the student is still looking for ways to adapt to the existing obstacles - 16th year old (HL Student B)): The student read a lot and looked for journals regarding music analysis and examples of assessments from previous years. Watch videos about orchestral music analysis and project examples from IB students from music schools. - 17th-year-old (HL Student C): Student remembers that she seriously wants to learn music and doesn't want to lose her love for music. Remember that people who deepen and study things they like or make a hobby often get bored and abandon it.

3.2. Discussion

3.2.1. Jean Piaget’s Cognitive Process

In the findings of this research, the description and result are based on data obtained from interviews. Jean Piaget’s cognitive process (see Fig. 4) is divided into three stages: assimilation, accommodation, and equilibration [33]. These three stages are applied by HL/SL music students, who eventually find their equilibrium or balance. The students' prior knowledge (assimilation) stems from their diverse musical backgrounds. This influences the accommodation process, where they acquire new knowledge, which varies among the students. Some HL music students had never studied certain concepts before, while others had. For example, not all HL music students had the same foundation in music theory. Based on the data findings, students must adapt to their environment to achieve cognitive abilities. Some students follow the existing rules/norms and values in their surroundings, while others cannot adhere to these rules/norms/values and instead create their own rules, shaping the environment according to their desires, or in other words, doing as they please. All of this is done solely to achieve each student’s goals in their cognitive development. In other words, students persist in continuing their cognitive development.

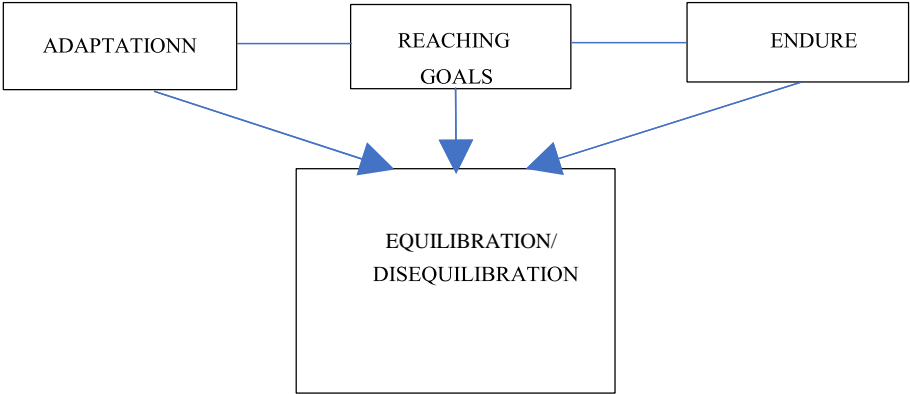


Fig 4. Jean Piaget’s cognitive development scheme

3.2.2. Final Music Composition Music HL

In the IB music curriculum context, assessment is a critical component that encourages both technical proficiency and creative development. IB music curriculum assesses students through various methods encompassing composition, performance, and listening skills [34]. All compositions have the essential elements of a composition, but there are still some works where the structure is not yet properly arranged. For example, some students choose to make their work consist of only one section, whereas there is still potential for it to be developed further. Not all compositions have balanced musical motifs; some have a different number of measures or use different pitches between motif one and motif two. All compositions have considered time signatures/measure indicators, with some using 4/4 or 3/4 time, although the variety is still limited. Below is the description of contemporary music maker composition by students :

- HL Student A wanted to create music that makes studying feel fun instead of stressful. Using GarageBand, the student-produced lo-fi music to go with a time-lapse study video, aiming to match the visual and audio for a relaxing experience. While building the composition, the student initially overlooked requesting the lo-fi music references that the collaborator frequently listened to. During the reflection phase, the student felt the project was successful. However, there are still areas for improvement, particularly in communication and teamwork between the composer and the collaborator, as they overlooked the reference to lo-fi music. The timeline starts on the 2nd week of December 2023 to March 2024. Fig. 5 is the QR code for the outcome of soft music studying.



Fig 5. QR code is the outcome of soft music for studying.

- HL Student B aimed to introduce Indonesia's traditional culture to high school students through a musical adaptation of the Si Pitung folktale, focusing on piano compositions and traditional elements. After completing the original dialogue composition, the student rehearsed the musical roles with the theatre team. In the reflection phase, the students noted that their musical successfully conveyed the message to preserve and raise awareness of traditional folktales, particularly among senior high students as the primary target audience. The timeline starts in December 2023 and goes on to February 2024. Fig. 6 is the QR code for the outcome of the original song for the dialogue and musical live performance for parts 1 and 2.

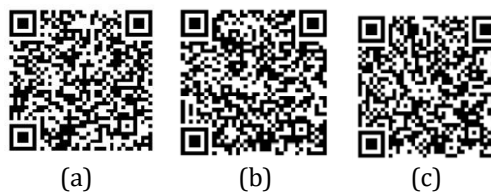


Fig 6. (a) QR code the outcome of the original song for the dialogue; (b) QR code musical live performance; (c) QR code musical live performance-part 2

- HL Student C aimed to use music as a medium to raise awareness about nature conservation. Their musical goal was also to develop composition skills, particularly in modern music, by incorporating electronic and guitar instruments. This composition is played in the C major scale with a C-G-Am-F chord progression. After creating the chord progression using plug-in keys, the student added a layer of strings. The student did not go through this process, and no evaluation or reflection was conducted with the teacher or collaborators on this work. The timeline starts on the 3rd week of December to March 2024. Fig. 7 is the QR code for the composition result by HL Student C.



Fig 7. Code the composition result from HL Student C

3.2.3. Achieving each student's equilibrium

Based on the IB scores obtained by students, this can be one of the determinants of whether the student has reached equilibrium. During the two-year process, each student achieved their equilibrium, as evidenced by the score they received. The highest moderated mark of Contemporary music maker HL only assessment was completed by HL Student B, while the lowest was obtained by HL Student C, see Table 5.

Tabel 5. Contemporary HL only score result

Contemporary music maker HL Only	Contemporary HL only result	
	Moderated mark	Grade
HL Student A	19	5
HL Student B	22	5
HL Student C	8	3

4. Conclusion

Based on the analysis of the creative process conducted by HL music students, it can be concluded that Jean Piaget's cognitive theory provides valuable guidance for students as they navigate the processes of assimilation (integrating prior knowledge), accommodation (adapting to new knowledge), and achieving equilibrium (balancing the two). The quality of the students' equilibrium is reflected in their IB scores. This study further reinforces the relevance of Piaget's cognitive theory in general education and as a significant framework in music education. The experiences of HL music students during the stages of assimilation, accommodation, and equilibrium in the composition process demonstrate that Piaget's cognitive theory serves as a theoretical foundation for developing creative skills in music. Additionally, integrating cognitive aspects into the creative process aligns with Piaget's stages of cognitive development, indicating that music education can be enhanced by focusing on students' cognitive development stages. For future research, it is recommended to expand the scope of the study to include students from various educational levels—such as elementary, middle school, and higher education—or from diverse cultural backgrounds. This would help determine whether Piaget's cognitive theory remains relevant in the creative process of music across different educational and cultural contexts. Another suggestion for future research is to explore specific aspects of the music creative process, such as the relationship between musical elements (melody, rhythm, harmony) and cognitive development during the assimilation and accommodation stages. This could provide deeper insights into how each musical element enhances students' creative thinking abilities.

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