

## Article

# Practicing the Concept of Ubiquitous Learning: Constructing an Online Music Course on an International Education Platform

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**Abstract:** We developed a one-year course run of String Music Appreciation as an international online course on the British open education platform to present music teaching videos. Three main features were presented including music lesson explanations, instrumental playing demonstrations, and live music performances. The course contained four major themes and a total of 97 steps. Using the testing data provided by the education platform, we analyzed the performance of learners to understand how well the course was taught using three test data in the statistics dashboard including course-run measures, total statistics, and statistics by week. We reviewed the course's star rating in a one-year run. The result of teaching the course needs to be evaluated and adjusted in a future study.

**Keywords:** Music online courses, MOOCs, Ubiquitous learning, String music, General music education

## 1. Introduction

Online music education is a new teaching method with a discipline (Blackburn and McGrath, 2014). The general promotion of online learning courses in recent years has allowed course developers and consumers to follow this online learning trend. The teaching method of online courses is not as direct as traditional teaching, and there is less possibility of direct face-to-face teaching and practice. In the content design of the course, more aspects are considered to construct complete content. General music education courses are not traditional training courses that require one-on-one instruction to improve students' technique. On the contrary, through online 24-hour teaching, students learn and study music anywhere and anytime.

This research was carried out to share the authors' experiences who are the designers of the *String Music Appreciation* course which is a four-week general music education course and evaluate how it operates on the Future Learn Education Platform. This course emphasized a different stringed instrument subject every week, including four topics of activities. The *String Music Appreciation* provided knowledge on the historical background of stringed instruments, instrument construction, performance methods, demonstration performances, related musicians, and their works. In addition, the content of the *String Music Appreciation* on the education platform was presented in four different types of activities: videos, articles, discussions, and quizzes. Each activity was provided in each step. Learners followed the courses in the sequence of steps and were given advice. They asked questions as they completed each step. Through the one-to-one dialogue, the interaction between learners, host, and lead educator became direct. Learning evaluation and results were reviewed every week so that learners could immediately feedback on their learning. The following items were discussed and studied in this study.

- (1) Development of the video steps and the course subjects generated by connecting different steps in a four-week online course
- (2) Learning effects through the learning statistics developed by the platform and the content of the course design
- (3) The number of times learners completed steps and posted comments in different weeks to compare the learning situation of learners in different weeks
- (4) Star ratings and qualitative comments of the learners who completed the course and summarizing the quality of this course and the direction of future improvement

## 2. Literature Review

Music educators use internet resources and technologies excitingly and innovatively. The Internet continues to be used as a tool for music education (Baur, 1999). As online courses gradually acquire knowledge, more students register on education platforms to realize learning anytime, anywhere, regardless of time and place. Crawley mentioned in her book ‘Supporting Online Students: A Guide to Planning, Implementing, and Evaluating Services’ (Crawley, 2012) that "Effective student support is the most important factor in maintaining a high-quality online learning program." In recent years, many educators have used various technological devices, including mobile phones, to conduct pedagogically sound practice of face-to-face and online courses (Barbosa et al., 2012). Many people are concerned about whether online courses can provide the same quality as face-to-face courses to learners. However, experiments confirmed that when educators designed online courses using pedagogically sound practices, such online courses provided learners with the same effective learning environment as face-to-face courses (Driscoll et al., 2012; Binkley & Hall, 2003). Therefore, perfect course content design and effective creation of an environment determine the success of an online course for learning.

The number of learners taking online courses has increased year by year since 2010. Many educational institutions and universities in the United States offer online courses (Allen & Seaman, 2010). Taking online courses to obtain certificates or degrees has become a new type of higher education. Online micro-credentials are one of the specialized courses offered by world-leading universities. In addition, Massive Open Online Courses (MOOCs) have become popular in recent years (Hamilton, 2023; Pomeroy et al., 2015). Even before the outbreak of the COVID-19 pandemic, MOOCs and other online teaching courses became new learning models in the development of technology (Katz, 2013; Vázquez-Cano, López-Meneses, & Sarasola, 2013). Online courses such as MOOCs have created an opportunity for universities or educational institutions to allow educators involved in research and development courses in their areas of expertise (Frau-Meigs, Osuna-Acedo, & Marta-Lazo, 2021). Online courses delivered through the Internet facilitate the acquisition of information and knowledge, as well as individual and collective participation and contribution (Bossu, 2021).

## 3. Research Methods

### 3.1. Materials

The video-based course was established step by step with three main features in the teaching video, namely Music Lesson Explanations, Instrumental Playing Demonstrations, and Live Music Performances. Steps in the course were added with the teaching video for discussions, quizzes, and articles. Fig. 1 shows the conceptual image of the online course *String Music Appreciation*. Its teaching video was composed of three features to develop other steps related to the theme. Table 1 presents a four-week online course and sixteen topics, containing the subject of the weekly course progress and the number of course steps. Learners interacted and asked questions in every step and obtained a certificate after completing 97 steps of a four-week course.

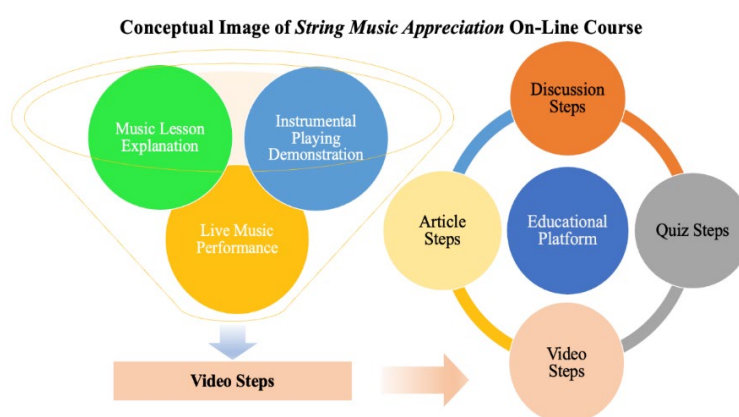


Fig. 1. Conceptual image of string music appreciation online course.

**Table 1.** Four-week online course and sixteen topics course planning.


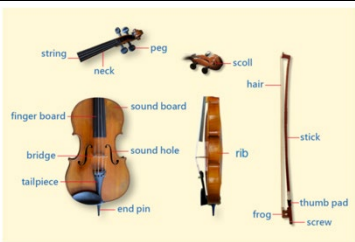

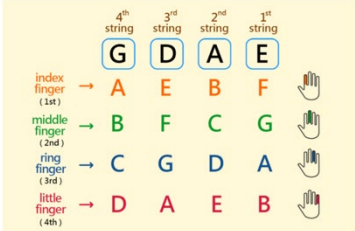
Week	Topics	Steps/Activities	Highlight
			<p><b>Greetings from Shan-Ken</b></p> <p>37 comments</p> <p>Hello, my names is <b>Professor Shan-Ken Chien</b>, and I am a violinist.</p> <p>Currently, I am an associate professor and executive director in the master program for industry music at Chung Yuan Christian University in Taiwan. It's very nice to meet everyone. I hope you will broaden your knowledge of string music in this course.</p> <p>Learners are welcome to comment or post questions in each step. Educators will present on the course to respond to learners' questions via replying comments. Due to international time difference, please expect the possibility of delays from educators' reply.</p> <p>You may introduce yourself shortly, and express what instruments you play, or you could fill in the blanks underneath. Thanks!</p> <p>My name is __ I am from __. I am a __ at __ (school/industry name). I learned to play_ (instruments) since __ (year/years old).</p>
	Welcome to String Music Appreciation	2	 <p><a href="#">View transcript</a></p>
	The History of Violin	5	<p><b>Earliest String Instruments</b></p> <p>6 comments</p> <p>In this video Professor Shan-Ken Chien states that the earliest string instrument originated in central Asia, but it was not until 1530s that there was proof that luthiers, who are makers of string instruments, start creating instruments that represent the early models of the modern violin. In addition, the professor talks about two ancestors of the violin, the rebec and rebab.</p>
Subject 1: History and Construction of the Violin	The Construction of Violin	5	 <p>A breakdown for names of elements of a violin</p> <p><b>The four main parts that make a violin</b></p>
	The Violin's Bow	6	 <p><a href="#">View transcript</a></p> <p><b>Violin Bow Parts</b></p> <p>4 comments</p> <p>In this video we talk about different violin bow parts, their functions and what material is used. When referring to the bow, we typically name the upper half of the bow "tip", the middle of the bow "middle part", and the lower half of the bow "frog". Bow parts including the bow mortise and bow grip are also mentioned in the video.</p>
	Violin's Technique	6	 <p><b>Use your four left hand fingers to create different notes on the violin</b></p>

Table 1. Cont.




Week	Topics	Steps/Activities	Highlight
	The Viola	5	<p><b>Quiz on the Viola</b></p> <p>Which one of the following comparisons between violin and viola is incorrect?</p> <ul style="list-style-type: none"> <li><input type="radio"/> The size of a violin is bigger than a viola.</li> <li><input type="radio"/> Compared to the violin, the viola's bow has more bow hairs.</li> <li><input type="radio"/> Violins come in several sizes, while the viola has no standard size.</li> <li><input type="radio"/> The viola has thicker strings than the violin.</li> </ul>
	The Cello	8	 <p><b>Bringing a Cello with you on a plane</b></p> <p><a href="#">7 comments</a></p> <p>Lets say a cellist is scheduled to perform in a different country, if the cellist plans on bringing their instrument with them on the plane, they will have to buy a ticket for their instrument.</p> <p>Would you suggest that the owner should buy a seat/ticket for the cello or trust it in the cargo hold?</p> <p>Feel free to share your opinions down below.</p>
Subject 2: Bowed String Instruments	Violin Family and Viol Family	6	 <p><b>Viol Family but not Violin Family</b></p> <p><a href="#">2 comments</a></p> <p><b>Violin family v.s. Viol family</b></p> <p>It is likely you can name most or all of the members of the violin family (Viola, Cello and Double Bass), however many people have not heard of instruments in the similar viol family, as it is not as popular as the violin</p> <p>The full name for the viol is Viola da gamba. The instruments have different sizes like violin family. There are treble, alto, tenor, bass and more. The big difference between these two instrument families is the number of strings. Violin family has standard of 4 strings and viol family has more than 4 strings. Viol family instruments have 5, 6, or 7 strings.</p>
	The Double Bass	7	 <p><a href="#">View transcript</a></p> <p><b>The Double Bass—Introduction</b></p> <p><a href="#">2 comments</a></p> <p>This activity we are going to talk about the double bass. Professor Shan-Ken Chien invited bassist Travers Huang to give us an introduction of the instrument, comparing it with our modern violin. Furthermore we explain two types of the double bass bow.</p>

Table 1. Cont.






Week	Topics	Steps/Activities	Highlight
	Butterfly Lovers' Violin Concerto- Introduction	7	<p><b>Western music instruments playing Eastern music</b></p> <p>2 comments</p> <p>Can you imagine Western music instruments playing Eastern music? Is it possible that Western music instruments mimic the sounds of Eastern music instruments? Will it sound absurd or play out perfectly?</p> <p>We will find out in this activity about the famous violin concerto: Liang Zhu, which is a fusion of eastern and western music.</p> <p>Before we dive into this music piece, leave a comment on your thoughts about Western music instruments playing Eastern music.</p>
	Butterfly Lovers' Violin Concerto- I. Falling in Love	7	<p><b>Guess what Eastern instrument the violin is mimicking!</b></p> <p>3 comments</p> <p>One of the main characteristics of Liang Zhu is that it uses western music instruments to mimic the sound of Eastern instruments, which is showed in the second theme of this concerto.</p> <p>Before we get into the second theme of Liang Zhu, the following are two short music excerpts of the violin mimicking two particular Chinese instruments, can you guess what the two Chinese instruments are?</p> <p>Don't worry if you don't know yet, or aren't sure. We'll look more closely at these Eastern instruments later in the week.</p> <p>▶ <a href="#">audio 01</a></p> <p>▶ <a href="#">audio 02</a></p>
Subject 3: Special Topic: The Butterfly Lovers' Violin Concerto	Butterfly Lovers' Violin Concerto- II. Refusing to Marry	5	<p><b>Pentatonic scales v.s. major or minor scales</b></p> <p>2 comments</p> <p><b>Pentatonic scale</b></p> <p>In music theory, a scale is any set of musical notes ordered by pitch. Scale forms music and represents the color of the sound. The most common modern Western scales have seven pitches/notes per octave and include major and minors.</p> <p>A Pentatonic scale developed independently in several countries and has quite unique musical styles. In the West, we find the pentatonic scale in some impressionist composers' works such as Maurice Ravel's <i>Ma mère l'Oye</i> or Claude Debussy's <i>Voiles</i>.</p> <p>In the East, Chinese music is based on a pentatonic scale. There are five pitches/notes per octave. When the first note begins with one of the five, it would be the mode of that note. Chinese pentatonic scale follows by Gong(宫), Shang(商), Jue(角), Zhi(徵), Yu(羽) modes.</p>
	Butterfly Lovers' Violin Concerto- III. Transformation to Butterfly	4	 <p><b>Traditional Chinese Opera</b></p> <p>2 comments</p> <p><b>Chinese opera</b></p> <p>There are hundred branches of Chinese traditional opera in China. They all share similar stories in theater but are delivered in different dialects. The content of the operas comes from historical events or legendary stories. The most popular style of Chinese opera is Peking opera. Similar to western opera, Chinese traditional opera is an artistic performance. Characters have to sing, dance, chant, and act. They appear in elaborate costumes, and make-up is an important part of the complete art.</p>

Table 1. Cont.

Week	Topics	Steps/Activities	Highlight
Subject 4: Plucked String Instruments	The Classical Guitar	6	 <p><a href="#">View transcript</a></p> <p><b>Basic Classical Guitar Techniques</b></p> <p><a href="#">2 comments</a></p> <p>In this video professor Shan-Ken Chien breaks down left hand and right hand techniques when playing the classical guitar, followed by classical guitarist Alfredo Huang's demonstration of each technique. Afterwards guitarist Alfredo Huang also gives us a live performance of a famous music piece called Greensleeves.</p>
	The Electric Guitar	6	 <p><b>Guitar fever</b></p> <p><a href="#">4 comments</a></p> <p>Do you enjoy songs that are played by the electric guitar? Who is your favorite guitarist/ guitar band? What's your favorite electric guitar song?</p> <p>Exchange your thoughts with other learners using the comment section down below.</p>
	The Electric Bass	6	 <p><a href="#">View transcript</a></p> <p><b>History of the Electric Bass</b></p> <p><a href="#">0 comments</a></p> <p>The first electric bass: Model 736 Bass Fiddle was invented by Paul Tutmarc. Compared to our modern electric bass, the first model is different in its shape, wood of choice, and also the amount of strings, frets, and volume knobs.</p>
	Other Plucked String Instruments- Lute Family	6	 <p><a href="#">View transcript</a></p> <p><b>Common Bluegrass Instruments: Mandolin and Banjo</b></p> <p><a href="#">1 comment</a></p> <p>It is quite common to see Mandolin and Banjo in bluegrass music, an genre of American roots music. In this video we'll mention the shape, sound, tuning and the amount of strings on each instrument.</p>

**Total 97 steps of the entire course**

*Note:* The source of the highlight images for each topic is the *String Music Appreciation* course on the Future Learn Education Platform.

### 3.2. Methods

We analyzed the data from the statistical dashboard recorded by the Future Learn Education platform to understand the situation of the students taking the course and the operation status of the course. Various data were monitored in the one-year run from January 31, 2022, to March 13, 2023, to understand the number of people taking courses, course completion rate, step completion rate, and the number of posted comments. The statistical dashboard contained three items: course run measures, total statistics, and statistics by weeks. These three items of data were the direct access to the progress of the course.

### 3.3. Measuring Outcomes of Learning Progress

*String Music Appreciation* had 504 enrollments from 114 countries on the Future Learn education platform. There were 97 steps in the four-week online course. Learners commented on each step and evaluated the course upon completion. The Future Learn education platform provided measures of learners' progress on the statistics dashboard including course run measures, total statistics, and statistics by week. In the course, the measures of learners' participation were collected for the year run, including the number of participants and the proportion of total participants. There were a few measured data that required an explanation. Social Learners posted at least one comment on any step. The Course Retention Index was a measure of how the number of learners changed in the entire course. 47% of activated learners completed 47% of the course (Table 2). The total statistics were collected including the number and average of learners' visits to steps, completion of steps, and posting comments. Here we have obtained three aspects of data, namely the average number of visits, steps completed, and comments left by general, active, and social learners. Table 3 presents the total statistics of detailed data.

**Table 2.** Course run measures on the statistics dashboard.

Content	Number of Members	Ratio to Total Participants
Joiners	504	-
Leavers	34	6.7%
Learners	411	81.5%
Active Learners	278	67.6%
Returning Learners	162	39.4%
Social Learners	96	23.4%
Learners with $\geq 50\%$ step completion	138	33.6%
Learners with $\geq 90\%$ step completion	127	30.9%
Run Retention Index	0.47	47%
Fully Participating Learners	138	33.6%

*Note:* The data source is the *String Music Appreciation* course on the Future Learn Education Platform.

**Table 3.** Total statistics on the Statistics Dashboard.

	Total	Average
Steps Visited	51,721	40 (average against 411 learners)
Steps Completed	46,986	53 (average against 278 active learners)
Comments Posted	3946	12 (average against 96 social learners)

*Note:* The data source of this Table 3 comes from the *String Music Appreciation* course on the Future Learn Education Platform.

Statistics by week were collected as multi-faceted data on weekly learners. Knowing the average number of times each learner visits steps, completes steps, and posts comments from the courses of different weeks, the degree of attraction of different weeks of learners was estimated. Table 4 shows the data content of statistics by week.

**Table 4.** Statistics on the Statistics Dashboard by week.

<b>Week</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
Learners Visiting Steps	<b>408</b>	172	153	148
Active Learners	<b>276</b>	160	141	134
Social Learners	<b>91</b>	32	29	33
Visited Steps	<b>5123</b>	4339	3283	3215
Average Visited Steps Per User	12.56	<b>25.23</b>	21.46	21.72
Completed Steps	<b>4391</b>	3992	2985	2923
Average Completed Steps Per User	15.91	<b>24.95</b>	21.17	21.81
Comments	<b>546</b>	361	195	284
Average Comments Per User	6	<b>11</b>	6	8

*Note:* The data source is the *String Music Appreciation* course on the Future Learn Education Platform. Numbers in bold represent the item's highest number in four weeks.

### 3.4. Data Analysis

According to the course run measures of Table 2, 504 learners joined in the one-year course run, and 278 were active learners, accounting for 67.6%. In addition, 162 learners left and then returned to the course accounting for 39.4%. Such results showed that these students returned to the course after taking other courses for comparison. Social Learners were those who have posted at least one comment on any step. The data showed that 96 people were social learners, accounting for 23.4%. Not every learner was willing to post comments on the steps of the course. Learners with  $\geq 50\%$  step completion and fully participating learners numbered 138, 33.6% of the total number of learners. Several learners skipped several steps due to skipping steps. 33.6% of the fully participated learners rated the course as 4.7 on average after the course completion. However, shortening the total length of the course might improve the ratio of the fully participated learners.

411 learners completed an average of 40 steps, less than half of the 97 steps. Shortening the course content may increase the number of steps visited. 278 active learners completed an average of 53 steps, more than half of the 97 steps. These active learners seemed to be interested in the content of the course and completed more than half of the steps. 96 social learners posted an average of 12 comments. Posting comments revealed that learners actively participated in the course and responded actively to the content of each topic. Statistics by week on the Statistics Dashboard showed that most learners engaged in the course in the first week but the number in the next three weeks kept decreasing. From the three aspects of average data per user, in the second week, the average visited steps, completed steps, and comments increased compared to the other three weeks. The reason was that course topics in the second week were more attractive to the learners, or the learning between each step in the second week was not easy to choose.

## 4. Results

The learners evaluated the course with a star rating. 34 learners rated in total. 25, 8, and 1 learners rated it 5, 4, and 3 stars respectively. The average star rating for this course was 4.7 (Table 5). In addition, the learners left positive comments on the qualitative description of the Learner Reviews. One learner gave three stars commenting that the course was informative and enjoyable and expected more detailed knowledge about the electric guitar.

**Table 5.** Outcome of verified learners' evaluation.

<b>Star Rating</b>	<b>Number of Learner Reviews</b>
5	25
4	8
3	1
2	0
1	0
Total: 34 Reviews	
<b>Average score: 4.7</b>	

*Note:* The Learner Review source is the *String Music Appreciation* course on the Future Learn Education Platform.



As shown in Table 2, 70% of the active learners completed the course. 40% of the learners came back to finish the course again. Therefore, the variety of course content and the composition of each step met learners' expectations. In addition, we could discover in Table 3 that 278 active learners completed an average of 53 steps, which accounted for 54% of all 97 steps. Therefore, such average completion was half of the four-week course content. Such results showed the demand for shortening the course to two weeks in the next run. Table 4 shows that learning statistics in the first two weeks were better than those in the last two weeks. The number of personal average visits and completion of steps in the latter two weeks were close to the values in the second week and higher than those in the first week. The course content in the last two weeks was attractive for learners to learn. Therefore, it is necessary to consider splitting the courses in the first two weeks and the next two weeks into *String Music Appreciation I* and II.

## 5. Conclusions and Future Works

We explored the learner's behavior during the *String Music Appreciation* course in the one-year run on the *Future Learn Educational Platform* and whether the content design meets the learners' expectations. The learning data was analyzed to obtain course run measurement, total statistics, and weekly statistics. In this course run, most learners participated actively. The active learners accounted for 70% of the total number of learners. 40% dropped the course but decided to return to finish the course. The Learner Reviews showed that the learners rated 4.7 stars which was encouraging. One of the reasons for such a high rate was that the educator and host responded to the learners' comments promptly within 24 hours. With comments by the lead educator, many sources were supplemented for the subject of the course, which helped the learners learn effectively in each step. In the course, *String Music Appreciation*, directions can be considered for better adjustments in the future. First, shortening the course content to two weeks can attract more learners as they can complete more steps. Secondly, subjects need to be presented more diversely in four different ways, including videos, discussions, articles, and quizzes. Several steps can be considered being removed. Finally, a course needs to maintain excellent quality depending on the operation management. In addition to the continuous refinement and improvement of the course content, the feedback and support given by learners is crucial to maintaining the satisfaction of the course.

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