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# Develop a formative assessment protocol to examine the practice of Popping dance in students online learning

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The present article presents an innovative and versatile approach to formative assessment that allows educators to assess students' aptitude for online learning and their mastery of Popping dance. Popping dance, a form of breakdance, is increasingly being taught through distance learning programs. Despite the growing interest in Popping dance culture across different regions worldwide, few studies have focused on developing a comprehensive formative assessment model that combines Popping dance abilities and online learning. Therefore, we have developed a novel formative assessment framework for Popping dance students, which utilizes various online formats and offers a diversified assessment model. The article outlines five distinct assessment methods with practical examples that can enable students in heavily impacted areas to improve their Popping dance technique at home. These assessment methods cover software operation, theory testing, and technical testing, all of which are suitable for online use. While this model is still in its early stages, it provides a fundamental methodological framework for assessing the Popping dance proficiency of students.

## KEYWORDS

formative assessment, Popping dance, breakdance, Hip-hop dance, online learning

## Introduction

Breakdance is divided into two components: "breaking," the athletic floor-based movements often resembling acrobatics, and "popping," the mimetic/robotic component which in New Zealand is called "boppin" (Kopytko, 1986, p. 1).

Popping dance is a form of breakdance that originated in New York (Torp, 1986; LaBoskey, 2001; Walker, 2012; Tjukov et al., 2020). During in global COVID-19 pandemic, the offline class of Popping dance has been temporarily suspended, online Popping dance courses has emerged as the preferred method of instruction among Popping dance teachers. Various research studies have demonstrated that online teaching grants students more flexible learning opportunities and access to a wider range of learning materials (Lusa Krug et al., 2021; Prasetyo et al., 2021; Rucsanda et al., 2021; Travis et al., 2022). This form of teaching not only saves expenses but also maintains a regular teaching schedule and delivers learning content that is often comparable to real-world instruction (Hsia et al., 2016; Kier and Johnson, 2022). It is important to note that

though the research does confirm the growing popularity of online teaching, the available data is insufficient to draw definitive conclusions on its impact on students' learning efficiency. Online teaching does present certain drawbacks, such as significant academic delays for students and the inability of teachers to instantly correct mistakes made by students (Klingsieck et al., 2012; Qiu et al., 2022).

To address the potential environmental shortcomings in online teaching, it may be useful to think of formative assessment as a tool (Airasian, 1968; Li, 2020; Heyang and Martin, 2021). Effective use of formative assessment in this research is defined as an effective means of tracking student progress and identifying areas in need of improvement (Dean, 2007; Bennett, 2011; Antoniou and James, 2014; Andrade et al., 2015; Spector et al., 2016; Rasooli et al., 2018). Through real-time monitoring, teachers can provide targeted guidance and support to enhance overall learning outcomes (Schmid, 2012; Andersson, 2014; Li, 2020; Zhou, 2022). By implementing a formative assessment task focused on online Popping dance, instructors can quickly assess student proficiency and adjust their teaching methods accordingly. This article attempts to identify an appropriate assessment method to help the teacher of Popping dance online more intuitive and convenient to understand the students' learning progress, students can also use the Internet and computer software to learn dancing at home anytime and anywhere, reducing the time wasted commuting to class.

## Methods

In the development process of the formative assessment project, an exhaustive search was undertaken across various databases such as Web of Science, SAGE, and JSTOR to find articles pertinent to the formative assessment task related to students' online learning of Popping dance. Literature was screened using the keyword "Popping dance," albeit the term was not consistently explicit. Some authors opted for related phrases like "Electric Boogie" (LaBoskey, 2001) or "Hip-hop dance" (Borges et al., 2018). Importantly, only articles addressing both Popping dance and online dance assessments were included, with coverage spanning styles, classic characters, history, and online education.

Additional literature searches were conducted within the Dance domain to ensure a comprehensive exploration of relevant sources. It is essential to highlight that the selected articles had to encompass the process of Popping dance in relation to the design of the formative evaluation task. Inclusion criteria were as follows: (1) articles must be peer-reviewed and written in English, (2) they must specifically pertain to Popping dance, and (3) they must contain an item or criterion related to the assessment criteria, either within the article or as supplemental material. These literature search methods were chosen to review the availability of literature parallel to the research topic for the development of evaluation projects, thereby helping establish effective evaluation programs.

To guarantee an unbiased review of the literature, we applied Messick's six aspects of effectiveness theory to authenticate the formative assessment of Popping dance ability level (Messick, 1995). These six facets include content relevance, substantive literature references, assessment structure, generalization, external task relevance, and potential outcomes. Due to space constraints, our

literature review primarily centered on online Popping dance ability assessment, compiling a summary of relevant literature including the author, year, research subject, article type, and reason for inclusion. For further details on the review methodology, please refer to the provided sources (Walker, 2012; Mabingo, 2015; Hsia et al., 2016; Parrish, 2016; Li, 2020; Delabary et al., 2022).

## Results

Upon reviewing the 100 selected publications, it was determined that only a limited number of publications exist regarding the assessment of the competency level of Popping dance online. Out of the articles studied, only 15 related articles met the predetermined requirements, from which we selected one representative literature.

In reviewing the literature, we discovered that while relevant literature does not delve specifically into the assessment of Popping dance ability, it does offer valuable insights for our investigation. Popping dance as a dance style can benefit from incorporating assessment methods from other dance fields into our study. Our research concentrates on outlining criteria for assessing online ability levels, identifying scoring options, and preparing students for their Popping dance assessment. We will refrain from discussing content related to off-topic assessments. Interested readers can refer to the following works for more information (Bradley and Dubois, 2017; Li and Vexler, 2019; Geffen, 2020; Yang et al., 2022).

### Review assessment tasks related to Popping dance

This section concentrates on the items, criteria, and preparations for online Popping dance, employing a method analogous to Wei et al. (2022). Wei et al.'s (2022) assessment task adheres to Messick's six validity aspects, offering a low-risk, formative assessment approach.

The assessment results are intended to gauge the ability of breakdancing students, thereby contributing to the quality of learning in breakdancing instruction. The points include:

- (1) Student performance is connected to the assessment content.
- (2) There is no evidence suggesting students have undergone training prior to assessment.
- (3) The task exclusively evaluates the theoretical learning ability of breakdance students, excluding other types such as Popping dance.
- (4) Although specific breakdance theories are outlined, there are no set standards for breakdance techniques.
- (5) Evidence is obtained by collecting students' online responses. Despite the provision of correct answers, there is no systematic guidance to help students find the right answers.
- (6) Two scoring points are set in the short answer section, with scores accorded primarily based on consistency with the correct response.
- (7) The assessment items closely align with the scoring criteria.
- (8) Assessment tasks allow students to gauge their understanding of the learning content, simultaneously encouraging proactive knowledge acquisition.

## Assessment task design

This section will design a formal, low-risk formative assessment task related to Popping dance, inspired by the work of [Cagasan et al. \(2020\)](#). As [Tinanoff et al. \(2019\)](#) suggest, a “low-risk” assessment implies the absence of disease risk factors and the presence of protective factors. This assessment aims to provide students aged 8–13 who are learning Popping dance with a simple and user-friendly guide to assess their ability to execute basic Popping dance movements. The reason that we choose Popping dance as the research content. There are several reasons for this: (a) The movements of Popping dance are more detailed and intuitive than other dances, the range of movement is relatively small, and it is easier to assess online. (b) The assessment model designed by us is suitable for modification and replication in other dance types and can be applied in a variety of dance teaching fields. (c) Researchers are more familiar with the technical system of Popping dance. Therefore, Popping dance is more suitable as an example of dance for online dance assessment. By providing level maps and corresponding assessment criteria, the assessment will clearly interpret the results as the student’s ability improves.

Assessment results serve two primary purposes: characterizing students’ ability levels and supporting teachers in their tasks.

Regarding the former, these assessments help identify:

- (1) Students’ proficiency with online learning, particularly through the Wukong App.
- (2) The students’ understanding of operating the Wukong App, which involves three steps: exploring various functionalities (such as discovery, training, teaching, testing, and personal settings), selecting the “Small Video” from the “Discover” section, and then choosing a specific video to learn from the “Popping” option.
- (3) The comprehension level of students related to Popping dance movement terms.
- (4) The proficiency level of students in executing the Popping dance movements.
- (5) The ability of students to synchronize with the rhythm of the music using Popping dance movements.
- (6) The skill level of students in choreographing their own Popping dance routines.

In terms of aiding teachers, these assessments:

- (1) Evaluate the overall suitability of the Wukong App for students of varying ages to search for Popping dance videos.
- (2) Provide insights to Popping dance teachers to adjust their teaching strategies.
- (3) Help identify the proficiency levels of Popping dance students, enabling personalized feedback.
- (4) Facilitate the organization of subject-specific meetings to share and discuss results.

## Pre-assessment preparation

To ensure the accuracy of the assessment, it’s crucial to conduct some preparatory work. This preparation will help familiarize both teachers

and students with the Wukong App, reducing the risk of operational errors that could produce variables unrelated to the assessment structure.

Wukong App’s assessment method comprises three components: equipment, student participation, and teacher operation. For the assessment, students need a mobile phone (for operating the Wukong App) and a camera (for recording the test video). Wukong App is a renowned street dance education tool in China, offering courses in Jazz, Locking, Popping, Breaking, and Hip-hop. To maintain impartiality, the invigilator should not be the teacher of the students being assessed. Ideally, another teacher should administer the exam to prevent any potential bias.

For testing theoretical knowledge, online texts are used, with graded items offering a variety of question formats such as multiple choice, fill in the blanks, true/false, and short answer questions. After students have submitted their responses, teachers collect the test papers for grading. Technical examinations require students to record their performances, which are then sent to the teachers for assessment. The teacher will evaluate each video according to the criteria outlined in [Table 1](#). The array of projects for the formative assessment of Popping dance, based on online formats, is broad, mitigating the risk of under-representation to some extent ([Messick, 1995](#)).

## Scoring process

The scoring process can be influenced by students’ varied performances, potentially leading to unfair or inaccurate scores. To mitigate such issues, it’s important to consider the following aspects during the post-assessment scoring stage:

- (1) Social Moderation: To prevent bias, it’s preferable to have a teacher who is familiar with the student’s typical performance yet not directly involved in their education score the assessment ([Childs and Umezawa, 2009](#)). For instance, two graders could alternate marking duties, while teachers who have been directly involved in the teaching process avoid grading. This can help mitigate the risk of bias that might arise from teachers assessing their own students, which could affect the accuracy of the scoring and the reliability of the data.
- (2) Shared Understanding of Criteria: Teachers and assessors should establish a common understanding of the assessment criteria. They should align their perspectives on the abilities that students can demonstrate to minimize errors and ensure fair grading.
- (3) Data Recording: As suggested by [Griffin \(2017\)](#), teachers should link each item to a specific skill in an Excel spreadsheet. This allows for easy referencing during explanations. It’s recommended to save the recorded data as electronic documents or charts for easy accessibility and reduced chances of loss.
- (4) Data Storage: Protecting data security and privacy is crucial when storing assessment data. It’s important to use secure and reliable storage methods to safeguard student information.

## Item description

According to [Wolf and Stevens \(2007\)](#), we checked the assessment criteria. The first iteration is the establishment of

TABLE 1 Student capability progress level map.

		Mapping of items and judgement-based rubric criteria to construct levels					
		Objective item numbers		Criteria numbers			
Level 5	Students at this level can summarize or summarize Boogaloo and Popping dance movement, term definition. They can demonstrate the movement: Based on Ticking Wave, Neck-o-flex, Twist-o-flex, Master-o-flex and Ticking dance in 30 s. Using dance movements to incorporate the melody, the app Popping dance follows the same style of music with different rhythms. In the prescribed limited time, on the basis of generating new dance movements, personal emotion into the dance movements to create a new dance work.	Technical demonstration skill/knowledge/attitude assessed: choreography and creation of dance moves		2.4	3.4	4.4	5.4
Level 4	Students at this level can incorporate the Popping dance and movements involved in the Wukong App into the choreography process, and show the movement of wave, Neck-o-flex, Twist-o-flex, and Master-o-flex in different directions or speeds within 60 s. Based on integrating the Popping dance movement into the rhythm, the Popping dance movement is combined with the melody. Create new dance moves independently based on the original moves within the limited time allotted.	Technical demonstration skill/knowledge/attitude assessed: follow the music tempo using Popping dance movements		1.4	3.3	4.3	5.3
Level 3	Students at this level can summarize the advantages and disadvantages of Wukong App and other online learning software and use Wukong App to search the Popping dance history and movements. Based on the definitions of the terms pop and wave, distinguish the differences in how the two actions are performed. Based on the demonstration of pop and Fresno, wave, Neck-o-flex, Twist-o-flex and Master-o-flex movements were arranged and blended into the rhythm of music.	Technical demonstration skill/knowledge/attitude assessed: show the Popping dance movement.		1.3	2.3	3.2	4.2
Level 2	Students at this level can compare the advantages and disadvantages of the retrieval function of the Wukong App with other online learning software, and describing clear definitions of key terms such as pop's major muscle use, wave motion, and joint utilization of the limbs.	Multiple-choice item, cloze item, true-or-false, short answer skill/knowledge/attitude assessed: summarize Popping dance, classic characters and dance.		1.2	2.2		
Level 1	Students at this level can describe the category retrieval function of the Wukong App and describe the definitions of the terms pop muscle use and wave joint use.	Field operation skill/knowledge/attitude assessed: online learning was performed using Wukong App. The term of Popping dance was described		1.1	2.1		

assessment criteria, classified into five primary areas: mastery of the Wukong App for tutorial purposes, comprehension of Popping dance terminology, proficiency in executing basic Popping dance movements, ability to dance in rhythm, and competency in merging choreography with music. The second iteration sets the assessment level, comprised of five levels indicative of progressive growth. Students evaluate their test performance based on these levels and receive feedback to improve their skills. In the third iteration, assessment descriptions are crafted for each scoring item corresponding to the evaluation form. To ensure teachers can accurately score students, each

standard is characterized by identifiable attributes. These iterative formative assessment tasks are designed to provide a straightforward and instinctive learning and assessment experience via the network. Furthermore, we have intentionally developed a variety of item types (see Table 2).

In an effort to ensure the reliability of our assessment results and mitigate the effects of any irrelevant structural variations, our team has instituted several measures. Initially, we have rigorously gathered articles from eminent scholars across diverse fields. This collection forms a comprehensive understanding of the origins of Popping dance, deliberately omitting any

TABLE 2 Assessment item.

Serial number	Question types	Example	Option	Right answers	Scoring guide
1	Single choice item	Who created the Boogaloo style?	A. DJ Kool Herc B. Run D.M.C C. Afrika Bambaataa D. Boogaloo Sam	D	
2	Multiple-choice item	Which of the following are Boogaloo style movement?	A. Neck-o-flex B. Twist-o-flex C. Master-o-flex D. Kingtuts	ABC	
3	True-false	Jazz is a style of breakdance	True/False	FALSE	Jazz is not a breakdance style
4	Cloze item	Popping dance has a variety of styles, including_____, which mimics the movements of a robot; The Wave style, for example, is mostly dance by _____. _____ is the main music used by Popping dancers, often referred to as_____. _____is a style of breakdancing that was popularized worldwide by the movie "Breakin I"(1984)		Robot /knuckles/ Funk music/Popper/ Popping	Words can also be considered correct if they are spelled close enough to the correct answer for the tester to recognize the word.
5	Short answer	What are the three main styles of breakdance?		Popping, Locking, B-Boy	1 point for acknowledging that Popping dance and Locking dance are breakdance styles/1 point for acknowledging that B-boy is breakdance styles

ambiguous interpretations. For example, certain scholars regard Popping dance as an independent dance style (Ramsey 1995), while others associate it with breakdance or Boogaloo (Walker, 2012). We have crafted the question content in such a way that neither perspective contradicts the other. Additionally, we have standardized the lengths of the options to deter students from deducing the correct answer based purely on length. Lastly, the criteria for evaluating proficiency are delineated in Figure 1. These assessment criteria pertain to students' Popping dance abilities, providing a guide for teachers during the scoring process.

## Conclusion

This article presents a diversified assessment model for the future evolution of Popping dance, informed by existing literature. It aims to furnish teachers with the tools necessary to guide students in performing App search videos, developing a knowledge system, demonstrating technical movements, and integrating dance choreography. The proposed assessment model comprises five methods and includes examples, making it suitable for online use. It enables students, especially those in severely affected areas, to overcome the constraints of time and space by studying from home. The assessment model emphasizes software operation, theory testing, technical testing, among others, yet it acknowledges its

limitations. These limitations may originate from environmental, human, and subjective factors, with the latter being the most challenging to control. While it is impractical to eliminate all irrelevant variances, assessors are urged to establish communication with participants beforehand, secure their trust, and foster a conducive test environment. Primarily, this paper concentrates on designing a formative assessment task for Popping dance in an online format. It is hoped that this article will aid teachers of Popping dance grappling with the challenges of in-person teaching and facilitate a more convenient assessment of students' Popping dance learning via online means. While this task is preliminary, it paves the way for future research on the assessment of online dance learning outcomes.

## Author contributions

All authors listed have made a substantial, direct, and intellectual contribution to the work and approved it for publication.

## Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

1. Ability level characteristics of online learning using Wukong App (Indicative behavior criteria):
  - 1.1 Describe the classification retrieval function of Wukong App
  - 1.2 Compare the advantages and disadvantages of the retrieval function between Wukong App and other online learning software.
  - 1.3 Based on summarizing the advantages and disadvantages of Wukong App and other online learning software to use the Wukong App to retrieve the Popping dance history and movements.
  - 1.4 Incorporate the Popping dance style and movements described in Wukong App into the choreography process.
2. Identify the ability level characteristics of Popping dance movements terms (Indicative behavior criteria):
  - 2.1 Describe the definitions of muscular use of the terms Pop and articular use of Wave.
  - 2.2 Explain the definition of the use of the major muscle group of the term Pop and the use of the trunk, limbs and joints of term Wave.
  - 2.3 On the basis of the definitions of the terms Pop and Wave, distinguish the differences in the way the two movements are executed.
  - 2.4 Summarize or summarize the movement, execution mode and term definition of Electric Boogaloo and Popping style.
3. Demonstrate the ability level characteristics of the Popping dance movement (Indicative behavior criteria):
  - 3.1 Show the basic movements of Popping dance: Fresno, Pop.
  - 3.2 Show Wave, Neck-o-flex, Twist-o-flex and Master-o-flex actions on the basis of Pop and Fresno.
  - 3.3 Show different directions or speed changes of Wave, Neck-o-flex, Twist-o-flex, and Master-o-flex movements in 60 seconds.
  - 3.4 Ticking dance based on Ticking Wave, Neck-o-flex, Twist-o-flex, Master-o-flex, and Ticking Action in 30 seconds.
4. Characteristic of the level of ability to follow the rhythm of the music using Popping dance movement (Indicative behavior criteria):
  - 4.1 Use Pop to follow the rhythm of music.
  - 4.2 Incorporate multiple Popping dance movements into music rhythm.
  - 4.3 Combining Popping dance movement with melody based on integrating Popping dance into rhythm.
  - 4.4 Based on incorporating dance movements into the melody, use Popping dance movement follow the same style of music with different rhythms.
5. The characteristics of the ability level of choreographing Popping dance routine (Indicative behavior criteria):
  - 5.1 Be able to imitate Popping dance movements in the video.
  - 5.2 According to the online teaching content of Wukong App, one or more Popping dance movements are demonstrated
  - 5.3 Within a limited time, a new Popping dance routine is created independently based on the original Popping dance movement.
  - 5.4 Within the limited time, new Popping dance choreography are created by integrating personal emotion into dance movements.

FIGURE 1  
Judgement-based assessment rubric.

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