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THE USE OF DIGITAL PEDAGOGICAL ASSESSMENT IN THE TEACHING OF DANCE NOTATION

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Abstract
The purpose of this study is to explore the relationship between digital technology and folk dance, highlighting the teaching methodology of the subject of Dance Notation. We first provide a brief insight into the history of teaching dance notation, followed by presenting its current educational practice. Related to this, we discuss the relationship between digital tools and dance education in a separate chapter. Pedagogical assessment plays a key role in our study, as we want to show how regular digital formative assessment makes the teaching of dance notation more effective and motivating. We outline further directions at the end of the article that could be introduced or at least researched as a pilot project in dance education.

Keywords: dance notation, kinetography, digital tools, teaching methodology, assessment

1. INTRODUCTION

In the last 20 years, people's lives have been radically permeated by the use of digital devices. No age group is an exception. We use digital devices in our homes, workplaces, and during our free time activities and during learning as well, so why not use them in such special areas as arts education.

Although the relationship between digital technology and dance education is still immature, innovations in dance education such as the use of *motion capture*,[1] the integration of virtual reality, the movement analysis by collecting data through digital devices, the changed online educational situations brought by Covid19, created a number of opportunities that could redefine the culture of dance education of the future. Traditional frontal education no longer holds its place as a dominant

[1] *Motion capture* is the process of recording the movement of (e.g. dancing) people using a high speed digital technology. The data thus obtained is reflected in a 3-dimensional model, so that the virtual character displayed on the computer performs the same movements as a living person.

form of teaching at any level of education. Students should be involved in the current educational process in order to be as active a part of it as possible, and not only when they are actually dancing in practical classes but also when they are at theoretical courses in the art of dance. Using digital tools in a didactically grounded way promotes the involvement and activation of students, somewhat catalysing the joyful, successful, and effective participation in the teaching-learning process.

In this study, we present how we integrated a measurement and evaluation tool, called *Kahoot!*, in one of the dance training courses, namely in the subject of Dance Notation. Before explaining this, we provide an insight into the history of the dance notation systems, and also into the history of dance notation teaching methodology in Hungary based on the work of Mária Szentpál and János Fügedi. Later we enumerate the digital technology tools that can be used in pedagogical assessment, providing an overview of those digital tools that could be incorporated into the teaching of dance notation. The Dance Notation course, the education of the Laban kinetography, is an effective combination of theory and practice. Once students have mastered the theoretical foundations of dance notation, they can also perform the notated movements. The integration of digital tools into this combined course is a successful good practice, the presentation of which aims at contributing to the insertion of digital technology into dance education.

2. THE HISTORY OF DANCE NOTATION SYSTEMS

The Laban kinetography used today to analyse and record dance movements dates back nearly a hundred years. We briefly present the historical path of dance notation in this chapter.

According to János Fügedi, the concept of a dance notation system can be defined as follows: "Dance notation is the two-dimensional recording of a dancer's human movement, usually on paper." (Fügedi, 1993a, p. 48).

Not all of the nearly a hundred dance notation systems known today have proven to be equally effective. In the beginning, from the 15th century, dance steps in Europe were lettered, or the most characteristic movements were drawn. For example, the steps of the *Basse Danse* were marked with the following letters: "(...) r - révérence (the bow to start dancing), s - simple or passo (a step forward), d - double (three steps forward and close), b - branle or continenza (swaying step), r - reprise (moving backwards)." (Fügedi, 1993a, p. 48) Raoul Feuillet released a widespread dance notation system in 1700, based on the initiations of Pierre Beauchamp, which was in use for more than a hundred years in the Baroque era and could indicate the musical synchrony of dance (Fügedi 1993b). Around the 19th century, drawings were simplified to stick figures. The first notation system based on stylised stick figures was created by the French Arthur Saint-Léon, who published his system in 1852 under the title *Stenochoreographie*. *Figure 1* shows a short series of exercises from Saint-Léon's book. The dance notation systems that were developed in the 19th century did not become more widespread in general (Fügedi, 1993b).

In the 20th century, unlike before, various systems emerged, grouped around an artistic or scientific paradigm shift. Today, two systems have emerged, the *Benesh dance notation* system and the *Laban kinetography*. Joan and Rudolf Benesh's system was designed primarily for ballet practitioners. In its staff, not the whole figure

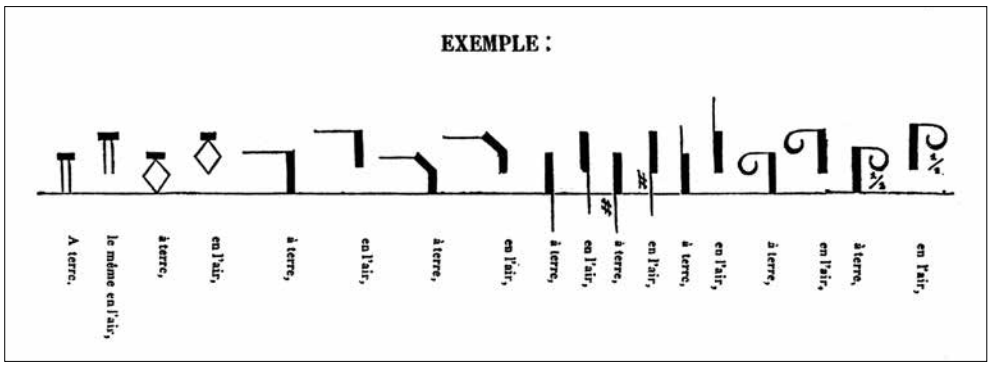

Figure 1. A short series of exercises from Arthur Saint-Léon 's book (Saint-Léon, 1852; Fügedi, 1993b, p. 50)

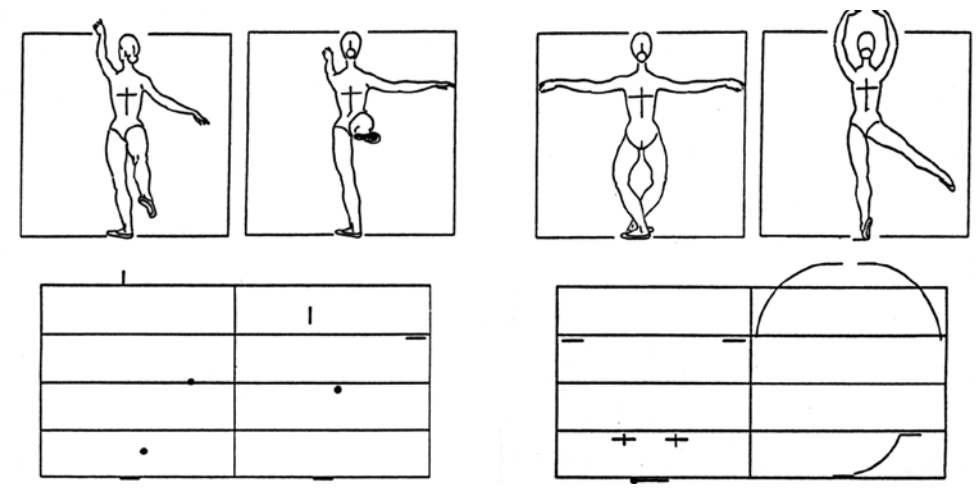

Figure 2. Benesh notation depicting the endpoints of body parts (Fügedi, 1993c, p. 49)

appears, but only the endpoints of body parts (Fügedi, 1993c). *Figure 2* illustrates simple movements notated with the Benesh system as viewed from behind.

In 1928, Rudolf Laban announced his kinetography system at the 2nd German Dance Congress in Essen, which he published in the same year under the title *Schrifttanz 1*. In the dance notation system developed by Laban and his colleagues, the signs to the left of the staff's centerline describe the movements of the left body parts, and the ones to the right describe the movements of the right body parts. Signs in the columns next to the centerline represent support movement; symbols written in the columns at the borderlines of the staff indicate leg gestures, movements that do not carry the weight of the body. The Laban kinetography that applied a comparatively small amount of symbols at the beginning, has become increasingly complex over the years, and is still being developed to this day. It is suitable for the notation of ballet, modern dance, folk dance, and several other dance styles, but also for gymnastics or acrobatics (Fügedi, 1993c). *Figure 3* shows an excerpt from Schrifftanz; here, the notation is published horizontally instead of the usual vertical placement of the staff.

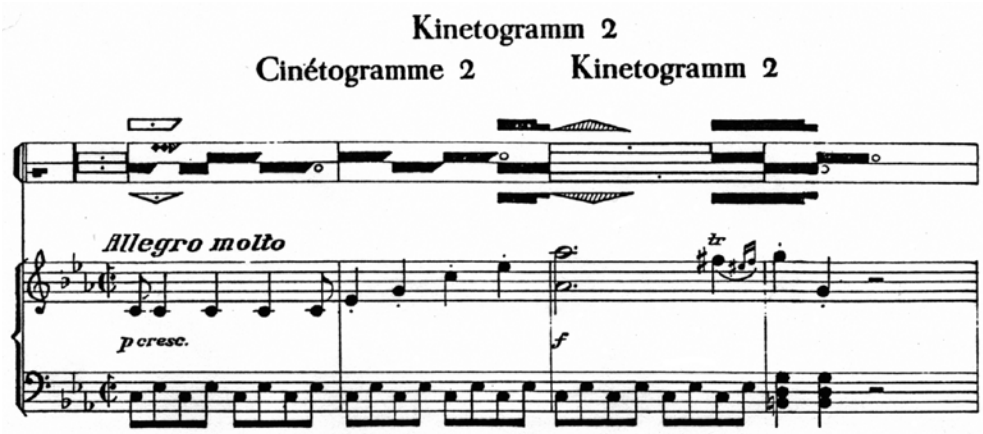

Figure 3. Example of Rudolf Laban's dance recording system (Fügedi, 1993c, p. 48)

3. THE TEACHING METHODOLOGY OF KINETOGRAPHY IN HUNGARY

The beginnings of teaching kinetography can be traced back to the 1930s, but the characteristics of the subject's teaching methodology have not been described to date. The pedagogy of kinetography was therefore explored through an interview with János Fügedi. We begin the methodological-historical overview with the story of János Fügedi's teacher, Mária Szentpál, in order to get a comprehensive picture of the development of the method of education in kinetography.

Mária Szentpál developed her education method for correspondence courses. In her book, she assigned a processing time frame appropriate to the level of difficulty of the curriculum. She expected students to prepare in advance for contact lessons. During the attendance sessions, they first discussed the problems that might have arisen during learning at home, and then Szentpál required the students to reconstruct the examples of the unit, accompanied by piano. Reading about her method, we can think of the flipped classroom method that is widespread as digital devices appear in education, the essence of which is what Szentpál also used: students prepare at home from pre-published theoretical learning material, and then the teacher can place the emphasis in class on practicing, on asking questions, and on implementing group work (Menyhei, 2020).

Mária Szentpál divided the subject into movement analysis and the introduction of the dance notation system, kinetography itself. In her publication on movement analysis (Szentpál, 1987), she explained the concepts of movement analysis in detail. However, in her notation education book, she does not return to the explanations but uses the concepts over and over repeatedly.

In her above-mentioned three-volume book, Szentpál applies a threefold system of illustration: (1) simple figures illustrating the textual explanations, (2) short notation examples not intended to be performed, but illustrate a phenomenon in context, and (3) reading exercises that reinforce comprehension and aims at implementing theory into practice. As an illustration, Szentpál mainly selected movements and motifs from choreographies; only a small number of original folk dance material can

be found in her book (Szentpál, 1964). *Figure 4* shows unit II in Szentpál's book with figures, examples, and reading exercises.

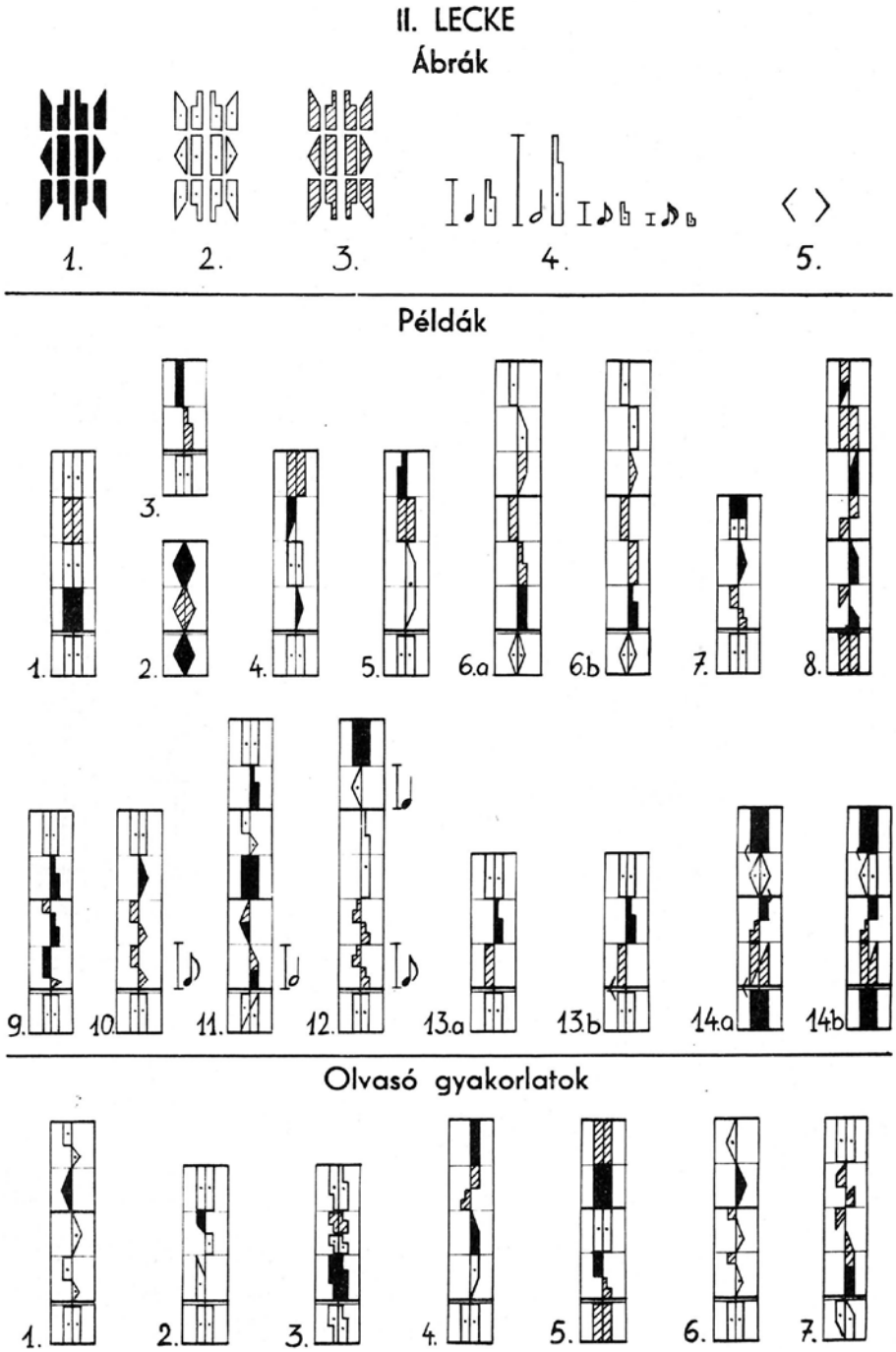

Figure 4. Figures, examples, and reading exercises from Szentpál's book (Szentpál, 1964, p. 4)

Students could always ask their questions about the current unit at Szentpál's lessons. It was followed by dancing examples, and its evaluation was a formative assessment—according to Fügedi. Students also got homework: assignments for each unit to transcribe short textual movement descriptions of motifs into kinetography. At the end of the course, students had to take a practical exam to reconstruct unknown motifs from notation beyond the textbook material.

The teaching methodology of János Fügedi has gradually changed compared to the methodology of Mária Szentpál. In the interview, he states that the reason for changing the methodology is more effective teaching. Szentpál typically taught in correspondence courses, where she had minimal contact hours. In comparison, Fügedi teaches in courses where the whole educational process occurs in attendance, so learning at home is not typical in this form of education. In Fügedi's book on kinetography (Fügedi, 2011), the textual descriptions and explanations are constantly changing with practical examples. It also differs from Szentpál's book in that almost all of the practical examples are from original folk dance material. Such an example, a folk dance movement is shown in *Figure 5*. The concept of Fügedi's book is to guide the student through the complex system of kinetography, based on the movement of a given culture (especially the Carpathian Basin). The first 25 chapters of the book provide basic knowledge, which can be interpreted alone but the units starting from Chapter 26 are suitable for acquiring a higher and deeper level of knowledge.

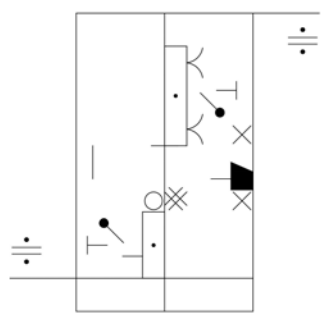

Figure 5. Notation of an Alsóbereczki *hatoztató* motif (Fügedi, 2011, p. 170)

Students have written tests from lesson to lesson at the kinetography courses of the Hungarian Dance University, and finally, a practical exam takes place at the end of the semester. Due to the structure of university education, Fügedi teaches the curriculum divided into semester units. The students may be admitted to the practical exam if they complete all their written tests at least at a sufficient level, which means a minimum 60% of the points. Students who have outstanding achievement both at lessons and in the written tests will receive an offered grade, which will exempt them from the end-of-semester exam.

In the last academic year, from September 2020, Fügedi introduced a well-known but new element in his notation courses, which already appeared in a similar form in Szentpál's method: the students are given study material to read and assimilate the learning contents at home. *Kahoot!*, introduced by Fügedi's colleague, Nóra Oláh, is applied at the notation classes to check the extent to which the students learned the study material at home. (See section 4.3 for details on the method.)

4. DIGITAL TECHNOLOGY IN DANCE EDUCATION

4.1 The Relationship between Technology and Dance

According to a 2005 study, dance is the only sector of education that has started to incorporate technology into teaching at a very late stage. The authors cite two reasons to explain the phenomenon:

- Dancers and choreographers find it difficult to bear if anything gets between the body and living kinesthetic experiences;
- Dance education is a sector with low marketability and consequently a late development of emerging technologies adapted to dance education (Calvert, T., Wilke, L., Ryman, R., & Fox, I., 2005).

Nevertheless, there have always been pioneers, including choreographers who have used digital technology to teach choreographies since 1968. There have also been professionals who quickly recognised the efficient connection between the virtual environment provided by the Internet and the display of choreography. Later, in the 1990s, the use of multimedia also infiltrated into dance education, and CD-ROMs could be used to learn various forms of dance or even dance notation (Dania, A., Hatziharistos, D., Koutsouba, M., & Tyrovola, V., 2005). Since the early 2000s, there has been a form of distance learning via the Internet that uses a Learning Management System (LMS), which fortunately does not avoid dance education either. We can read a number of studies that report on the distance learning form of dance education. According to our observations, this type of research can be divided into three major groups:

1. Choreographers are working together by bridging physical distances on online platforms (e.g., Popat, 2001; Popat, 2002; Weber, Mizanty & Allen, 2017);
2. Using motion capture technology, learning to dance can take place in a virtual environment (Chan, Leung, Tang & Komura, 2011; *WhoLoDancE Projec*t 2016-2018);
3. Theoretical curriculum for dance education in an LMS (Kavakli, Bakogianni, Damianakis, Lamou, & Tsatsos, 2004; Leijen, Admiraal, Wildschut & Simons, 2008).

The Covid19 pandemic situation that reached Hungary in the spring of 2020 also forced Hungarian dance education institutions to learn and teach on online platforms, together with all its possible advantages and disadvantages. Before the pandemic, the Hungarian Dance University did not use an online learning management system as an institutional solution for dancing lessons, but even for theoretical courses, except for the individual methods of some academic instructors (Lanszki & Bólya, 2018; Papp-Danka & Lanszki, 2020).

In 2019, the staff at the Institute for Musicology, Research Center for the Humanities, attempted to teach kinetography by implanting it in an LMS system. Kukár, Knapecz, and Papp (2019) attempted to transfer Fügedi's notation book to the Moodle LMS, where some chapters of the book were not only readable, but students could test their theoretical knowledge of dance notation using pre-prepared tests. At the 7th International Conference on Dance Studies, the authors stated: "In addition to understanding the system of kinetography and acquiring dance notation reading skills, we also consider it important to understand the movement world of folk

dance at a basic level, which we support with notation tasks. We aim to increase the flexibility of education, to make the acquisition of kinetography easier, all in addition to complete contact lessons." (Kukár, Knapecz & Papp, 2019, p. 46) The online tests in Moodle supported students' evaluation.

4.2 Fundamentals of Digital Evaluation, Especially the Formative Evaluation

Pedagogical assessment is one of the most essential pillars of the educational process. It allows us to gather information about the quality of teaching and the learning outcomes of the learner. The information collected during the assessment helps the educator plan the further learning-teaching process more effectively (Golnhofer, 2003).

Part of the planning of pedagogical processes is the planning of the assessment strategy, during which the teacher thinks about how to assess and evaluate the students' prior knowledge at the beginning of the educational process *(diagnostic assessment)*, how to ensure regular feedback during the learning process *(formative assessment)* and then how to classify the knowledge and skills acquired by the learner at the end of the educational process *(summative assessment)* (Golnhofer, 2003).

EMMI regulation No. 8/2013. (I. 30.) on common requirements for teacher training and output requirements for teachers, professions contain the competence area of pedagogical evaluation. However, the list of indicators does not cover the implementation of digital tools in pedagogical evaluation. However, if we take a look at the Digital Competence Framework for Educators (DigCompEdu, Redecker, 2017), we see that the DigCompEdu model lists several activities for the educators connected to evaluation:

- To use a variety of digital and non-digital assessment formats and be aware of their benefits and drawbacks.
- To use digital assessment tools to monitor the learning process and obtain information on learners' progress.
- To use digital technologies to enhance formative assessment strategies, e.g. using classroom response systems, quizzes, games.

It is no coincidence that DigCompEdu also treats evaluation competence within the pedagogical competencies as an independent field, as the use of digital technology in feedback situations has many benefits. Of these, the following are highlighted:

- The administrative burden of evaluation can be reduced: digital tests and evaluation forms can be created quickly and easily on a digital interface, and their reusability and the automated evaluation processes save time for the teachers.
- On the one hand, the results of digital assessments can be easily stored; on the other hand, spectacular visualisations of student performance can be created.
- Ways of digital assessment can be interactive, adaptive, and embedded in multimedia, so we can not only provide a variety of tests but also provide more accurate feedback to students (Hülber, 2020).

The Hungarian education system is often criticised because the primary goal of learning is only to obtain a good grade, which entails the exclusive or at least dominant use of the summative assessment. This also results in the learner not receiving feedback during the teaching-learning process about whether his/her

knowledge and skills are developing or not. Thus, the use of formative assessment is often omitted, while its introduction and regular use can not only promote student motivation and involvement but also lead to more effective learning. During a formative assessment, we determine the level of the learner's development and learning needs and adjust the teaching process to this, i.e.; we can manage teaching and learning strategies in a flexible interaction (Brassói, Hunya & Vass, 2005).

Formative assessment is an interactive assessment method that can be applied in the classroom and online learning environments. Many software are suitable for digital formative assessment, *Kahoot!*, and, e.g. Quizlet, Socrative, or Symbaloo Learning Paths. We can already say that *Kahoot!* has a long tradition in public education in Hungary. Nothing proves better than at the time of the writing of this study; there are 177.144 publicly available *Kahoot!* quizzes in Hungarian language. Of these plenties of quizzes, 29 were made for dance notation, the application of which is discussed in the next chapter.

4.3 The Role of the (Digital) Formative Assessment in the Teaching of Kinetography

Dance education is in a special position concerning formative assessment. In movement classes, be it folk dance, ballet, ballroom dancing, or other dance languages, there is continuous verbal feedback in most cases in order to make students perform the movements accurately. This primarily means error correction on the part of the educator, which is formulated for development purposes in order to enable the student to perform the movement as accurately as possible. In addition to error correction, of course, there may also be immediate, verbal positive feedback.

The above-mentioned formative oral assessment is also carried out during kinetography education, as learning kinetography requires partly practical, movement-based learning and a partly specific theoretical approach. The subject has a special structure in this sense: it is just as academic as it is practical. It is theoretical because the movement structures of dance need to be recognised and identified with different groups of signs. It is practical because the recognised movement needs to be put back into dance. After getting to know the signs and groups of signs of kinetography, the students have to prove their knowledge by performing the given motif, i.e., by transforming theoretical knowledge into dance practice. During dance practice, the instructor provides the students with continuous formative assessment, both individually and collectively.

Nóra Oláh expanded the repertoire of formative assessment in their teaching practice by implementing *Kahoot!*. Before presenting this in detail, it is important to note that different forms of training use different systems of requirements and different methodologies, too. Students in the *Dance Artist* degree program have fewer requirements than the students in the *Dancer and Coach* BA program. Students enter the Dance Artist program at the age of 13-15 after completing their primary school studies. Their training lasts for five years, during which they study according to a unique curriculum: studying in high school and university programs in parallel. Dance notation is a subject in the university curriculum, which students attend once a week in a ninety-minute class. In the Dance Artist program, the lessons focus on getting to know the system of kinetography and the exact reconstruction of

the examples in the textbook. Students are not given a learning material for pre-processing at home but must acquire all the knowledge within the class. There is less frequent summative assessment in the kinetography courses of the Dance Artist program than ones in the Dancer and Coach program. The students write two or three tests during the semester, which are easier than the Dancer and Coach program. At the end of the year, they will have to prove their knowledge at a practical exam. The exam for the students of both the Dance Artist and the Dancer and Coach programs consists of performing motifs selected from the textbook.

Kahoot! quizzes always take place at the beginning of the class for two purposes. On the one hand, it helps to get involved and tune in, that is, for students to arrive for a lesson that is very different from the other practical courses and to feel that the next hour and a half will be in the spirit of dance notation. On the other hand, it serves repetition as a didactic task, i.e., through *Kahoot!*, students can repeat what they learned in the previous lessons. In this sense, *Kahoot!* serves as a formative assessment, as the questions answered at the beginning of the lesson point the way to development: what are the signs, groups of signs that are still necessary for the student or group of students to practice. After answering the questions, the teacher can immediately see how many correct and incorrect answers were arrived. If the experience is that a large proportion of incorrect answers have been given, students will immediately get feedback supplemented with an explanation of what they have learned in the last lesson. After completing the *Kahoot!* quiz, the practical part of the lesson follows when the students perform the motifs of the actual lesson. In the meantime, they constantly receive formative oral assessment: the instructor collectively and individually improves the movements and dance structures performed by the students. It can also happen that they play *Kahoot!* at the end of the lesson, where they summarise what they have learned in class. In this case, *Kahoot!* is used as a tool for summary with the aim of formative feedback.

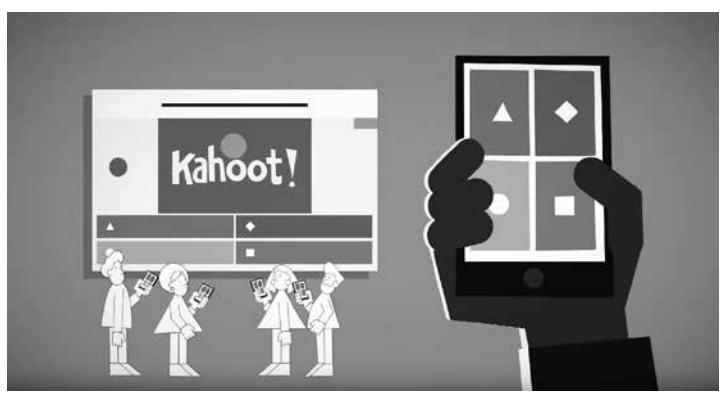

Figure 6. Kahoot! illustration—The response system interface (https://www.uniduna.hu/hirek/hirek-almenu/1625-veget_ert_a_due_elso_kahoot_bajnoksaga)

We only have a short-term experience with *Kahoot!* in dance notation courses. But we have already experienced that the changing workflows of physically demanding dancing practice and theoretical assessments result in a higher level of involvement. Students love playing *Kahoot*!, as the interface is very user-friendly and it also allows

gamification. One of the instructors' plans is to explore the effectiveness of this educational method with empirical research studies.

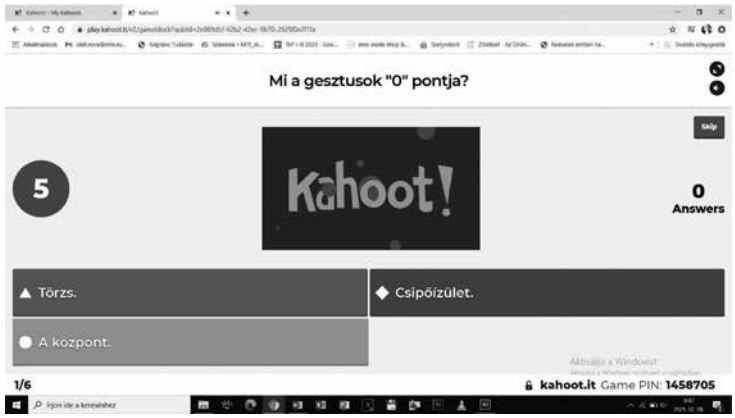

Figure 7. Question and Answers for *Kahoot!* interface (self-edited)

Another advantage of the interface is that the test results can be immediately viewed. The instructor can review the students' collective and individual achievement under the *Repost* tab and the proportion of correct answers to each question too. It can help plan the educational process for the next lesson by identifying the topics that need to be repeated in any case. On the other hand, student's individual achievement can be part of the total achievement in the summative assessment at the end of the semester.

5. OUTLOOK

We have outlined in this article the historical background of teaching kinetography and the main directions of the emergence of digital technology in dance education. We found a connection between the already used formative assessment in the practical part of teaching dance notation and the formative assessment proposed for use in the theoretical part of teaching dance notation. We have described a good practice on how to give feedback on the quality and quantity of academic knowledge to students from lesson to lesson with the aim of knowledge development. Although we focussed on *Kahoot!* and the current educational practice in this study, it does not mean that you can only work with this software if you want to apply digital formative assessment (see chapter 4.2), nor does it mean that only the dance notation curriculum can be assessed in this way. In our opinion, any knowledge of dance theory is suitable for incorporating formative assessment supported by digital technology.

The good practice presented here is just a small slice of the hopefully evolving relationship between dance teaching and digital technology. We already see several further paths ahead in which we could develop our current practice further. Among the easier ways to implement, the digital applications mentioned in Section 4.2. are worth trying. These included, e.g. the *Quizlet*, which would not only provide games, tests, and instant feedback but would also provide an excellent interface for self-

study: we could display notation signs, groups of signs on one side of the flashcards, while on the other side its name. Thus, we would provide flashcard learning to students, which has been proven to be an effective way of learning. As for the more complicated paths, we consider the gamification-based design of the Dance Notation subject to be reconsidered, especially in the Dance Artist degree program. In this case, the entire course should be restructured according to gamification rules, where students could choose from different tasks with different difficulties, for which they receive points, and which points could level their achievement up. Of course, the points earned and the levels achieved would be converted at the end of the semester to grade, but this way, we could manage the course in a completely different approach. Finally, we cannot go without fail to mention that in the current Covid situation, the everyday reality of online education is still hanging over our heads. This also has a profound effect on the teaching of the practical part of dance notation. Insofar as teaching dance through cameras, the formative verbal assessment is severely damaged and remains incomplete. So we need to think further about how we could develop either the theoretical or the practical part of the subject given the available frameworks and digital tools.

It is also worth considering that the subject of kinetography could be included in the high school curriculum as well. It would be a big step forward if students of the art of folk dancing did not meet the subject for the first time at the university. The set of symbols taught in the subject is a tool for a higher level, deeper understanding of dance because the notation system provides an opportunity to describe accurately and then understand the movement structures that appear in dance. The movements' technical development follows from a higher level of understanding (Fügedi, 2006). All art schools in dance aim that students reach a high level of technical knowledge, which could be facilitated by incorporating the education of kinetography into their curriculum.

Our study aimed at providing inspiration and motivation to dance educators through good practice with *Kahoot!*, demonstrating that we can build a bridge between dance and digital technology in many ways. We believe that to some extent, technology can profoundly help in dance education while also recognising that physical contact is in no way replaceable by digital technology.

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Applications

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