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A JOURNEY IN UNCERTAIN TIMES - DIFFERENT FUNCTIONS
OF VIDEOS IN HYBRID PIANO TEACHING

MA Thesis

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Abstract

This study aimed to classify the possibilities of different functions of videos to enrich piano teaching. An action research was initiated when the loss of the structuring nature of presence learning was visible during COVID-19. A mixed method approach was conducted to measure the impact of videos to cultivate students' skills. In that respect it was found that videos help students to study more productive, to reflect on their playing purposefully and to be more successful in music performances. A detailed classification of videos in teaching piano has been made dividing eight types of videos in two categories.

Keywords: *hybrid piano teaching, videos, videos as a reflection tool, motivation, piano performance, technology in piano teaching.*

Contents

1	Introduction	4
2	Literature Review – Theoretical Overview	5
2.1	Effects of the pandemic on music teaching	5
2.2	Piano teaching and social interaction	8
2.3	Practicing habits and flow	9
2.4	Background of the problem – Motivation of research	10
3	Methodology	12
3.1	Research design	12
3.2	Planning and taking action	13
3.3	Data collection and measurements	14
3.4	Ethical considerations	16
4	Results	17
4.1	Functions of videos in hybrid piano teaching	17
4.2	Cultivating students’ skills to study more productively	23
4.3	Using videos as a reflection tool	26
5	Discussion	29
6	Conclusion and Vision	31
	References	34
	Appendix 1	38
	Appendix 2	39
	Appendix 3	40
	Appendix 4	41
	Appendix 5	42
	Appendix 6	43
	Appendix 7	44

1 Introduction

Creating innovative learning environments in times of uncertainty has become more critical than ever. During the pandemic outbreak in March 2020, the situation of thinking about digitalization in education and using digital tools to support learning have changed rapidly (Hückelheim, 2020). Due to the epidemic situation starting in March 2020, schools were closed in Germany and worldwide to protect students and teachers from the spread of COVID-19 (UNESCO, 2020). Educators had to switch immediately from onsite to online teaching with insufficient preparation or experience in remote teaching (Hückelheim, 2020). The necessity to learn and work from home more independently seemed to be an overwhelming task at the beginning, especially in Germany (Schmidt, 2020). However, the quality of education depends on their practitioners' knowledge, skills, creativity, and passion (OECD, 2016). In that respect, the use of educational technology is not only a precondition for high-quality education. It has to be supported by the government and beyond that accepted and integrated by society. On the other hand, during the last twelve months, the extensive use of electronic devices and the internet has shown how urgent educators and students must face their need for meaningful ways to integrate advanced, up-to-date methodology (Kohlegger, 2021).

A very complex and challenging situation took place in the field of instrumental music education. Piano teaching onsite had been impossible for an indefinite time which gave room to explore the possibilities of teaching online. Two significant experiences were made: Teachers and students must understand how to operate their devices. Moreover, the traditional teaching and learning situation cannot be transferred in an online setting because movement sequences that are three-dimensional captured in an onsite lesson are reduced to a two-dimensional environment (Monno, 2021). Additionally, sound quality transmission is insufficient for developing coordination between listening skills and body movement as it is an essential part of piano teaching. In this regard, the interaction between teacher and learner must be transferred to another medium, while crucial social interactions and kinesthetic elements become impoverished.

There are many limitations of an online learning environment. However, to compensate for those limitations through video-based solutions in times where meeting in person is not possible was the aim of that research. Over and above that, applying technology in a meaningful or hedonistic way to develop piano skills and artistic expression was the purpose of that study. Furthermore, what can be preserved to post Covid times, and do we re-invent teaching (Kohlegger, 2021)?

A profound classification of implementing videos and their usage in the context of piano teaching has been made. A hybrid teaching mode has been established, which can hardly replace traditional education, but enriches the piano methodology and takes the latest findings as an additional component.

2 Literature Review – Theoretical Overview

2.1 Effects of the pandemic on music teaching

More recent attention was paid to providing data concerning music education when face-to-face meetings were very limited or not allowed. In that sense, the first part of the literature review considers surveys and research done in 2020 and 2021 to exemplify the problematic situation. The studies and reports of different countries illustrate the current dilemma in that field. A couple of associations started to examine music teaching and learning conditions during the first lock-down in 2020.

The ABRSM, the Associated Board of the Royal Schools of Music in the United Kingdom, reports that 87% of instrumental music teachers have effectively adapted to the new online teaching environment. 39% said that their students had made better progress (ABRSM, 2020). The survey was done in May 2020 and shows a considerable interest in circumstances that music teachers and music students were dealing with. In September 2020, the Educational Institute of Scotland (EIS) published the Instrumental Music Teacher Survey (EIS, 2020), in which they describe the situation of music tuition from June until August 2020. 63.69% of music teachers state that *“professional learning has been made available to deliver teaching remotely or through a blended approach.”* Furthermore, it is emphasized that *“many teachers have undertaken independent professional learning, focusing on practical aspects of Instrumental Music Tuition in remote or blended contexts”*.

Ververis and Apostolis conducted June 2020 a study in Greece. A collection of questionnaires was sent via email to all 48 Music Secondary Schools teachers, which provide instrumental lessons. The study aimed to not evaluate the work of the 87 participating educators but to investigate various topics like demographics, type of distance learning methods, and other problems that occurred during the school closure. The paper concludes that the great majority of participants *“could not think of any advantages of distance learning”* (Ververis & Apostolis, 2020, p. 8). However, some teachers referred to positive aspects of asynchronous teaching and learning *“when done in the traditional face-to-face way.”* It is mentioned that exchanging audio and video recordings between instructor and learner give both the opportunity *“to visit and edit the material whenever and as long as they wish”* (Ververis & Apostolis, 2020, p. 8).

On the contrary, a completely different picture was drawn in Scotland. With its membership from 53 organizations, the Music Education Partnership Program conducted very comprehensive research in the early months of the Covid-19 pandemic during June and July 2020 in which teachers, parents, and students were involved through webinars, interviews, and surveys (Moscordini & Rae, 2020). It is reported that a variety of platforms and online resources are available, including Glow¹, which is a

¹<https://glowconnect.org.uk/>

platform and workspace for students, educators, and parents provided by the government. Preconditions for efficient online learning are adequate technology for teaching online. That seems almost ideal in that country. Another aspect was given concerning students' engagement which "was generally high, but rose to 80-85% when audio and visible was available" (p.8). What is striking is that "100% acknowledged 'Young people who are considered gifted or talented' to be either 'Quite likely' or 'Very likely' to participate in this form of activity" (p.37). It was emphasized that "The social element of continuing [their] music lessons [which] is vitally important in maintaining mental health during lock-down periods" (Moscordini & Rae, 2020, p. 40).

Unfortunately, such statistics are not available for Germany. However, more than 21,000 children (Deutscher Musikrat, 2020) and adolescent musicians registered for regional youth music competitions *Jugend musiziert* 2020², the most important event for young musicians and a cradle of future music careers. Music talents meet for that event to qualify for the state and later on the federal round. To win one of the prestigious prizes is rewarding.

In Spring 2020, the competition had to be canceled after the first round Deutscher Musikrat 2020. First prize winners and qualifiers for the next step were left alone. The disappointment was huge. The government, subordinate organs, and associations were silent for a long time, not only regarding cultural affairs. However, students and their teachers activated many resources to make music tuition and music projects virtual happen. The focus went to the following years' music competition in 2021. Many efforts on the teachers' and students' sides were made.

Nevertheless, the number of applicants dropped down from 21,000 to 15,000 in 2021. This fact is a decrease of nearly a third. Do we as teachers observe that we lose some of our children and young people not only in music activities but in other sectors like sports as well? Or does this situation apply at all to the whole education sector in Germany? Preconditions for effective and efficient online learning are adequate technology and well-educated practitioners.

Andreas Schleicher, the Director for Education and Skills and Special Advisor on Education Policy to the Secretary-General at the OECD in Paris, said on May 10, 2021, in an interview which he gave on the world's largest education trade fair in Stuttgart (Schleicher & Millmann, 2021):

You have to realize that Germany entered this area practically a decade, i.e., ten years, too late and therefore has a lot to catch up on. Good digital learning platforms are hardly available, the teachers' level of knowledge is moderate, etc., But as I said, I think the corona pandemic has at least given the impetus. Probably more happened in the last year than in ten years before. (author's translation)

²<https://www.jugend-musiziert.org/index.html>

What stands out is the research “MUDIL” done in Austria by Aigner, Hahn, and Huber, 2021. Besides a very detailed study about the different circumstances of that time, the study also contains information on videos in synchronous and asynchronous settings in music education during the lock-down in 2020. Almost 90% of teachers and students were using live online videos and 81% of students recorded videos for their teachers. 40% of the music teachers reported that their students were more motivated during the school closure than before. “The majority of teachers consider musical distance learning to be a supplement, bridging, or temporary phenomenon. Nevertheless, around two-thirds plan to use digital tools for the time after Corona.” (Aigner et al., 2014, p. 11).

As indicated in the previous examples above, only studies have been taken into account to describe an exceptional situation in music teaching during the first months of COVID-19 in different countries in Europe. In most cases, technology was used very pragmatically as a quick fix to fight a temporary crisis.

Li and Kang take a completely different approach and enter the next step in piano teaching. They introduce an online and offline teaching mode as the new teaching mode based on internet technology and describe its design and method. They point out that “teachers have to flexibly master the newly teaching method to be used freely” (Li and Kang, p. 157). Regarding those considerations, it is assumed that China has in urban areas and metropolises an excellent functioning internet. 20% of all internet users of the world live in China. (Dong et al. 2020)³. From the author’s point of view, it is vital to have a well-developed data network infrastructure to develop a new concept of instrumental teaching involving internet technology.

Last but not least, the above-discussed surveys describe how instrumental teachers were searching for alternative ways to cope with the crisis using educational technology in some way. They took videos in synchronous and asynchronous settings as a quick fix to keep teaching and learning alive for their students during that crisis. Most of them, as described above, had no experience in e-learning or e-teaching and difficulties applying digital resources. In that matter, they acted as street-level bureaucrats

³China was hit first by COVID-19, but reacted fast. Schools were given the highest priority even when financial resources nationwide were tightening, with a “green channel” ensuring quality and efficiency in rapid procurement during the emergency. On 17 February, a national cloud platform was launched, offering digital learning resources to students in schools free of charge across the country. With 7,000 servers and a 90 terabyte bandwidth, the platform already accommodates 50 million learners simultaneously. And it was not just the government which mobilised resources: a wide range of contributors were stepping forward to provide everything from free Wi-Fi and devices for students through innovative instructional systems to social support for teachers and schools. Importantly, teachers were ready and able to connect with their students remotely, both synchronously for lectures and individual support, as well as asynchronously, with teachers offering online resources for self-directed learning. And those without access to digital resources were not forgotten. In many places, parents could collect free textbooks from schools or ask schools to deliver them to their home.

(Lipsky, 2010) and devoted their profession to the occurrent situation. “How to cope with the job as it actually is.” They had to make new routines to get to the job as well as they can. For independent judgment, you must balance the rules and a certain amount of freedom to let the teachers achieve the best know-how.

2.2 Piano teaching and social interaction

Piano teaching lives from social interaction. In a typical setting, mutual understanding during the teaching process is an essential key factor in instrumental coaching. Body language reflects with its mimic and gestures how the recipient or, in that case, the learner understands the music itself and its appropriation.

The acquisition of new specific expression patterns during the piano lesson is a fundamental key to success in the teaching process. The goal of learning a musical instrument is to master that instrument as well as possible. Studying a new piece of music involves learning new patterns of expression. On the other hand, patterns of expressions that the student is playing have to be revised and discussed and further developed during the acquisition process. The role of a piano instructor is to provide a kind of repertoire of body movements connected to the sound quality and the thinking process. Which movement (whole body, arm-hand-finger-coordination) leads to the intended sound quality and how can the student control and self-reflect this learning process?

The traditional way of piano teaching in which the participants meet in person is a highly developed process of trust and understanding. A few words or sometimes no word, but mimic or gestures lead to the required or desired expression, a process that involves emotions, awareness, and concentration.

Such synchronous teaching in a traditional way cannot be adapted in an online learning environment highlighted by instrumental teachers’ narratives (Ververis & Apostolis, 2020). It is not only the poor quality of sound, the ineffective equipment, or the connection instability; if all these occurring problems are solved (Tonny, 2018), it is the personal encounter that matters. A quotation of the German Cultural Council supports this statement (Deutscher Kulturrat, 2021):

The live experience of art and culture - regardless of the art form of expression - cannot be replaced by any digital offer. All that also applies to cultural locations as meeting places. The lock-down shows how much people need each other and the community. Art and culture stand for this community. Public and private cultural institutions must therefore be among the first to be able to reopen. Art and culture are essential for communities worth living in and the values that determine our society. (author’s translation)

2.3 Practicing habits and flow

During school closure, using different strategies in teaching and learning to be more productive in times in which interacting with students was very limited was a challenge and an exploration. The internet connection was not always stable. Videos helped to close the gap of latency. Those outcomes were developed as a valuable tool between synchronous and asynchronous teaching. However, an essential author's concern was to maintain good established practice students' behavior. When students primarily practice the piano because of the attraction of the activity, they experience flow (Rheinberg, Vollmeyer, & Engeser, 2003). Csikszentmihalyi describes flow as "a state in which people are so involved in an activity that nothing else seems to matter; the experience is so enjoyable that people will continue to do it even at great cost, for the sheer sake of doing it" (Csikszentmihalyi, 1990). The aim during school closure was to experience learning as a process of flow. Flow as a concept rather than a state is described in the literature (Pearce, Ainley, & Howard, 2005). Flow is a state between challenge and skill that most tasks show a state of arousal is examined among others in the context of musicians.

Using videos to raise self-efficacy, help cope with anxiety and further self-esteem are used in professional sport to train athletes (Stoll, 2021). In that context, the performance of athletes is recorded in training sessions. The videos are used to analyze the quality of performance. Furthermore, in stressful situations, where high performance is required, videos are used to give self-assurance and function as a tool "to believe in one's ability"⁴ (Stoll, 2021). Creating a piano learner's video portfolio to further self-esteem and self-confidence can be a helpful medium.

Short video sequences are the preliminary stage of video portfolios in which the learner develops over the acquisition process. In that respect, it is assumed that those small steps help the student to learn self-reflective and self-regulated. This process can be a profound preparation for performance examinations. McPherson and McCormick describe to which degree internal and external attributions are necessary (McPherson & McCormick 2000). Students' effort, nervousness, and ability are internal attributions, and on the other hand, as an external attribution task difficulty.

The authors' purpose was to look at various motivating factors that influence student performance through videos. The ability to perform well depends on a variety of motivating resources in addition to technical and expressive competence. It is proposed that how students think about themselves, the task, and their performance is just as significant as the amount of time they spend learning their instrument (McPherson & McCormick, 2000).

⁴Discussions and reports are taken from Psychology-lecture note health and motivation, Prof. Oliver Stoll of the MBA-Programm, Martin-Luther-University Halle-Wittenberg, Germany. Prof. Stoll trains athletes of the national team.

Self-regulation, planning practice habits, and evaluating one's own practice habits to improve the instrumental skills of musicians play an important role. In that respect is the quality of practicing more critical than the quantity (Nielsen, 2004; McPherson et al., 2017; Miksza and Tan, 2015; Hatfield et al., 2016).

Concerning the self-reflection phase of Zimmerman's cyclical model, participants were encouraged to apply music practice journals for ongoing reflection and evaluate the individual work carried out (Hatfield et al., 2016).

In a report about guitar lessons at the University of Music in Stuttgart, a student majoring in guitar describes his situation:

The original idea was to send my professor a recording before the online class to listen to my music I was currently working on in the best possible quality. It turned out that this activity had other positive aspects. An inner ambition and claim developed to record a lovely and flawless version. During the recording, a situation arose - as with the audition in front of an audience - produced a certain degree of nervousness, a process of closer listening, reflection, and improvement (Monno, 2021). (author's translation)

2.4 Background of the problem – Motivation of research

In response to the global events of 2020, music recitals and other live in-person concerts were not permitted. In times of isolation and lack of social interaction, it is not easy for adolescent learners who live, learn and make music together in a boarding school to be separated for more than three months. However, they had to cope with such unusual, challenging conditions.

In March 2020, teaching had to switch from a traditional learning environment to a hybrid mode which was not foreseeable to that extent. The researcher is a piano teacher and music educator in a secondary school. The subject Piano is mandatory for all students who attend the music department of that institution, a boarding school for students coming from different parts of Germany.

Ten 10th-grade students and six 11th-grade students between 15 and 17 years of age were selected for this study. All 16 students belong to the same piano class. The traditional piano lesson is a one-to-one lesson for 30 - 45 minutes every week.

Videos were used to replace or simulate situations or events to foster piano learning. The impact of videos in different learning environments has been described in other studies related to ICT subjects (Yousef, Chatti, & Schroeder, 2014). However, how videos enhance, foster, and keep the learning process in a flow state was not investigated. For this study, students were asked to participate in an intervention based on the need to develop new strategies for teaching. Videos functioning as an acquisition and reflection tool were integrated with teaching processes to support synchronous and

asynchronous learning. The learner does not have to wait until the next piano recital or the next lesson to get feedback from the teacher.

Furthermore, the voice memo app was used to visualize sound quality. On the other hand, videos can help piano students learn more independently and reflectively. Moreover, it had been investigated if a learning portfolio can further self-esteem and self-efficacy.

The most important task for the acquisition process is that the teacher keeps the flow state of acquisition for their students in balance and gives support, especially in uncertain times. Students can work with as little disturbance as possible.

The research is conducted in a mixed design with the following research questions:

RQ 1 Can videos enrich learning opportunities in piano lessons?

RQ 2 How can videos cultivate students' skills to study more productively?

RQ 3 Can video portfolios foster students' self-esteem to be more successful in music exams?

3 Methodology

This study deploys action research initiated when the loss of the structuring nature of presence learning was visible. In that context, two action periods took a very similar path, which helped to leave students' learning stable. At the end of the first period, a new form of the piano recital was initiated. This novelty had to be improved, which was done during the second action. The third action was applied parallel, but with other students preparing for the national music competition and had different tasks to master.

3.1 Research design

This action research aims to investigate how videos compensate, enrich, and expand possibilities in hybrid piano teaching. The study was conducted in three individual action periods which illustrate necessary adaptations to the pandemic situation. Three critical events in which students had to perform piano were taken as the marking point to analyze the observed period: 1. the piano exam in June 2020, 2. the nationwide held music competition *Jugend musiziert*, and 3. the piano exam in May 2021. These three different processes were planned and observed over a more extended period.

Adjustments to the schools' curriculum had to be made to allow for student assessment. Daily and weekly announcements of the government and the school administration changed school routines and made planning ahead difficult. As a result, the planned initial activities for alternating lessons had to be rescheduled a couple of times. To make piano lessons possible, the teacher had to make adjustments to each student differently. The school administration did not give technical and methodological support. At first hand, videos in asynchronous learning settings were used to keep the learning process going.

The research was designed using a mixed-method approach, collecting 64 videos of students' piano performances done live and virtual, applying semi-structured interviews, and one questionnaire with 33 questions. The benefit of this approach was that outliers and exceptions were taken and put into a more profound analysis with each student.

The study population (n=16) belongs to the same piano class but does not belong to the same grade level (grade 10; n=10; grade 11; n=6). The sampling was done purposively. The ages of the population ranged between 15 and 17 years (M=16). The participants are all students of the German boarding school Landesschule Pforta, a specialized high school for music, languages, and STEM subjects in Saxony-Anhalt. The subject Piano is obligatory for students attending the music faculty. At the end of each semester, they must perform a short piano program that is graded. The students from the 10th grade were chosen because their program was part of the intermediate exam. Usually, they would perform their music in front of an audience (teachers of the piano

faculty and classmates). Due to the problematic situation, it was foreseeable that the regular piano recitals in June cannot take place. For that reason, the author announced that the recitals would again take place as virtual recitals in a cloud-based environment where the students have to upload their piano performances in a video format. The students are familiar with this practice. During the first lock-down in 2020, the author introduced virtual piano recitals as an alternative to live performances. The students got highly motivated through those videos. They regularly sent well-performed piano pieces and asked for improvement. As a result, a virtual piano recital was designed in June 2020 which was graded.

3.2 Planning and taking action

First action period. During the first school closure in March 2020, the subject Piano had to be redesigned to make teaching online possible. As a consequence, the author established new routines in teaching and learning. The most critical challenges were the limitations given by the school administration and the ministry of education. The first recommendations to organize distance learning were aimed at communicating primarily via email. Two critical issues are to be explained in that context: First, the students were not used to write emails. A couple of them had no email address at all. It is known that teenagers like to communicate through other sources, such as Telegram, WhatsApp, Discord, etc. Second, it is laborious to upload videos in an email. In some cases, the students had to use the parents' email for communication. A few students had no computer or tablet. Organizing distance learning took much effort, and it seemed like the working days did not want to end.

However, the high workload was worth it. After four weeks, the author had established new routines which seem to fit distance teaching. The result was that almost all students became more productive than in the month of pre-Covid-19. 7 out of 10 students were able to play and master their pieces of music five weeks earlier as planned. Because of the observation made in June 2020, it is presumed that videos can cultivate students' skills to study more productive.

In Spring 2020, the author was surrounded by colleagues' resentments and prejudices concerning teaching piano online. Mentioned reasons were slow internet connection, untuned instruments at students' homes, e-pianos in students' homes, insufficient sound quality, etc. As a result of various discussions and different points of view, the author took different opinions to question the use of videos in piano teaching.

Second action period. During school closure from December 15, 2020, until May 25, 2021, the author activated teaching online and used the experiences from Spring 2020 with alterations. The learning environment was switching between onsite and distance learning several times, a critical situation for boarding school students for the following

reasons: in distance learning, students must practice their instrument at home. The pianos in the institution are high-quality instruments that most students do not have at home, but all students have at least a piano.

Additionally, the piano class was working with Microsoft Teams as a communication channel. Appendix 1 compares traditional piano teaching with exceptional teaching situations during school closure. All lessons are one-to-one lessons.

Third action period. Two students were preparing for the National Music Competition for Youth Jugend musiziert in the category Piano duo from May 15, 2020, until May 25, 2021. This competition has three rounds: the regional, state, and national round. Last years' competition was canceled after the first round because of the pandemic.

3.3 Data collection and measurements

The data collection supported the following strategy: In all three action periods, videos of students' piano playing/performance were collected.

For RQ 1, the following procedure was applied: entries in the chat section were done after the piano lesson by the teacher and the student. Based on the chats' entries in Microsoft Teams, the usage of videos was categorized by their similarities. These chats document the use of all different kinds of videos during all action periods. The students were asked in the semi-structured interview and questionnaire about using the videos during their learning process. The various functions of videos were investigated. The research was conducted with the following methods: collecting videos and video sequences that document learning progress, one self-report questionnaire, and semi-structured interviews. Furthermore, notes were taken in a teachers' diary.

The first data was collected from March 15 to June 10, 2020. The students recorded their progress and sent videos to the teacher to improve their piano playing: That implied sound quality, rhythm, dynamic development, and specific techniques to overcome technical difficulties. Video sequences and video files with music pieces were uploaded to the cloud. In mid-June 2020, students had to do a virtual piano recital as part of their exam at the end of the school year. This assignment was a substitute for the regular piano exam (Appendix 2). Additionally, the author organized a piano recital as a live performance recorded to compare their piano performance in a virtual setting and a live setting (Appendix 3). A comparison was made, examining their anxiety and the effect on their artistic development, which are statistically represented in the given questionnaire.

The second collection of videos took place from January to May 2, 2021, during the school closure (Appendix 4, Appendix 5).

The third set of data collection took place during the national contest of young

musicians *Jugend musiziert*. Videos were collected to document and analyze the pianist's different development stages.

In analyzing videos, the author could visualize and explain specific improvements to be met. The contest was planned as a live event which is done on three different levels. To qualify, you have to win first prize in your region and state. All rounds were planned as live contests. Last year the competition had to be canceled because of the development of Covid-19. This year, due to the whole situation, the committee decided in our state and nationwide to carry out the entire event virtually. The participants had to produce videos to qualify for the next round. A multi-staged process was included in the teaching practice. Videos were collected during 3.5 months of distance learning. The students had only five days of practicing together as a piano duo. This process was recorded and documented as well. After qualifying for the nationwide contest, the two students had to do the same procedure as before. A collection of videos was recorded. After recording the final performance, both students analyzed their work and the different application processes and reflected on their development. The task was to detect strengths and weaknesses to improve their musical skills and possibilities of expression.

For RQ 2, the two recitals were set up with the same music pieces. The students had to upload their videos twice, one week apart. The videos were graded and students' and teachers' feedback was given. The grading was compared and two questions were applied. First, is there performance improvement, and second, to which extent? A grading scale and a written report were handed to each student for progress to measure the result. Furthermore, students were asked in the semi-structured interview how they use different types of videos for learning. Based on that data, the students got the opportunity to reflect on their progression. In that context, it is assumed that videos can function as measurement tools to support self-regulated learning. To answer RQ 3, a questionnaire was given to the students online based on the 7-point Likert scale with 32 questions. All students responded. Additionally, semi-structured interviews were conducted in small groups using the video-based conferencing tool Zoom and recorded. The interviews lasted between 50 minutes and 85 minutes. Afterwards, the interviews were transcribed and translated. Similar word chunks were put in a table for topic relevance.

With the investigated group of action period three, the interviews were conducted on two different days. The first two interviews were conducted on one. The participants were asked to reflect on their experiences during the different phases of the one-year preparation. After the first interview, the interviewees were asked to watch videos that represent the various steps taken. After watching the videos, the second interview took place with the same questions to investigate their personal view and if their perspective had changed after watching the acquisition process. The third interview was done after

the announcement of the competition result.

3.4 Ethical considerations

All participants were adequately informed about the aim of the research and were asked to volunteer. A one-hour meeting was set up to give an overview of the whole process. A form of written consent was prepared for signing in which everything was explained in detail.

4 Results

4.1 Functions of videos in hybrid piano teaching

The chats of Microsoft Teams were analyzed to get an overview of the different types of videos and their functions used in hybrid piano teaching. The chats started on August 24, 2020. The last entry was taken on June 2, 2021. All students have their own chatrooms. At the end of the lesson, it is used to write a summary for the next lesson's tasks. Furthermore, video links to support their practicing were given by the teacher. For that reason, they represent all actions taken. Eight different types of usage were found which will be further explained.

Type 1: YouTube videos as a source of choice to select different music.

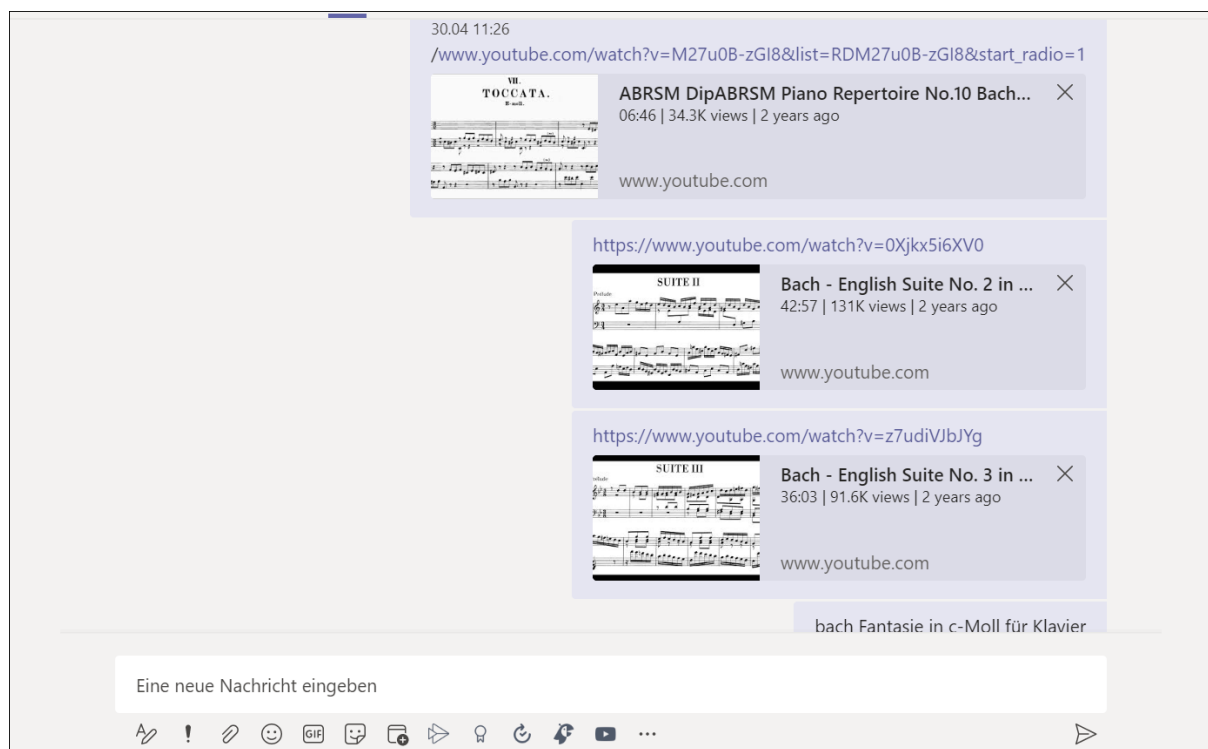


Figure 4.1: Chat Microsoft Teams - YouTube videos as a source of choice to select different music

This picture represents the different suggestions made by the teacher. The students watch the videos and decide afterwards which piece they would like to study next. The criteria of such suggestions are the level of students' difficulty, the student's preferences, and the school's curriculum. The teacher suggests a couple of pieces and interpretations from YouTube. All chats of 16 students were looked at. In 9 months, 92 chat entries were found.

Type 2: YouTube videos as orientation and motivation tool. “I improved my piano performance skills by watching YouTube videos of my current music pieces.” Most of the students, 70%, strongly agreed, agreed, and somewhat agreed (see question 2 of the self-report questionnaire in Appendix 7).

Table 4.1: Answers of question 2 of the self-report questionnaire

Q	Student n = 10	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	Mean
2	I have improved my piano performance skills by watching YouTube videos of my current music pieces	7	6	5	7	6	6	6	3	2	4	5.2

Two students strongly agreed, four students agreed, and one student somewhat agreed on that matter.

Type3: YouTube video as a learning source.

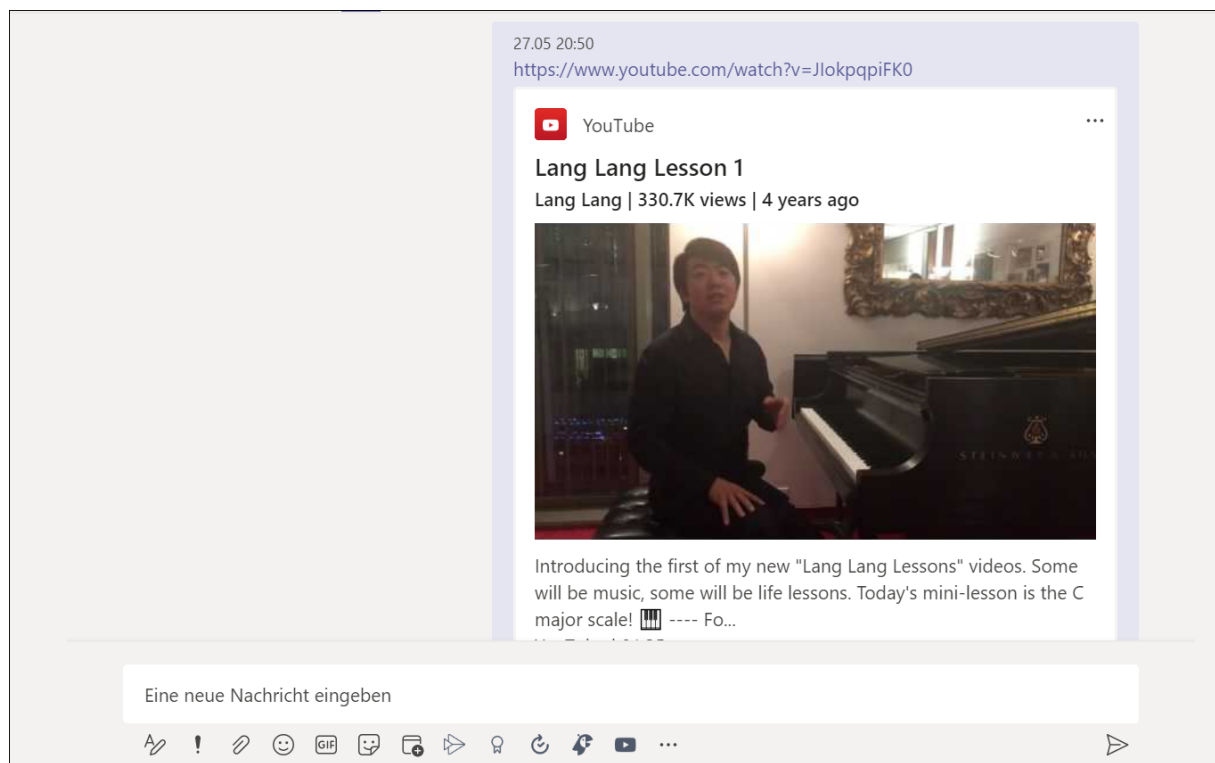


Figure 4.2: YouTube video as a learning source

Short videos explain one technical problem. For example, #LangLangLessons¹ is a very inspiring series of 54 mini-lessons. The video lengths range between 1:21 to 5:41

¹<https://www.youtube.com/hashtag/langlanglessons>

minutes. All Lessons are entertaining and give a short but essential hint. All students agreed on the lessons helping them to overcome technical problems explained in the video.

Type 4: Students' videos functioning as model videos for other students.

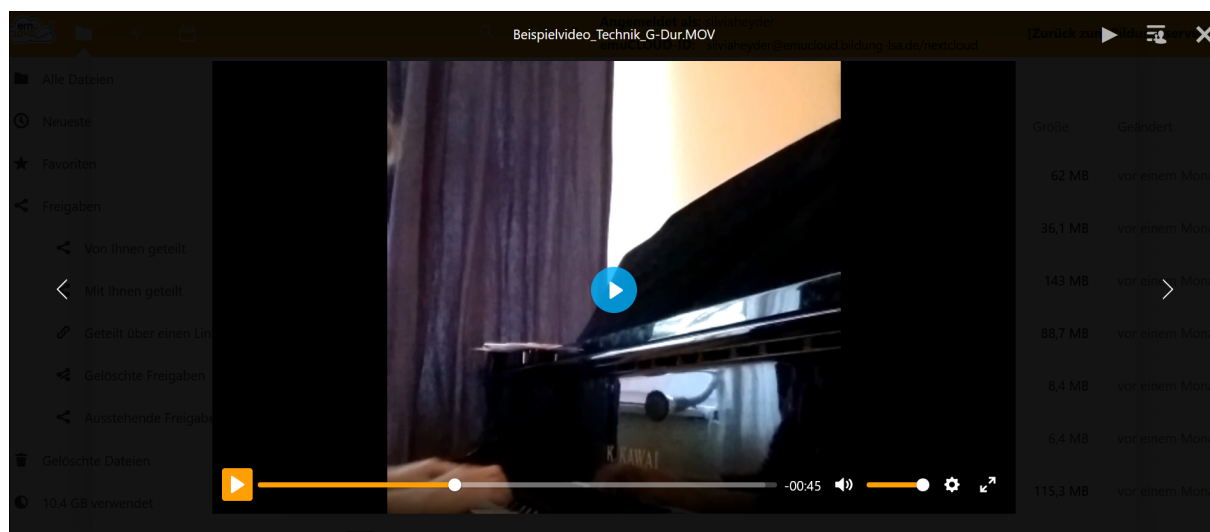


Figure 4.3: Students' videos functioning as model videos for other students

The picture represents a students' video of the first virtual recital in May 2020. The student was in the 10th grade at that time and performed exceptionally well. The student was asked if the video can serve as a role model for future students, which she confirmed. The video was integrated into the emuCloud as a sample for this year's 10th-graders.

Type 5: Videos as a self-reflection tool. Students record their playing. By watching their videos, they can detect mistakes in rhythm, tone, wrong notes, and dynamic. They can correct and record their playing until they are satisfied. "Videos help me to practice more self-reflective and therefore improve my performance in the future," (see question 29 of the self-report questionnaire in Appendix 7) All students agreed.

Table 4.2: Answers of question 29 of the self-report questionnaire

Q	Student n = 10	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	Mean
29	Videos help me practice more self-reflective and therefore improve my performance in the future	5	5	6	7	6	5	5	6	5	4	5.4

One student strongly agrees (7), three students agree, and five students somewhat agree. One is neutral in that sense.

Type 6: Videos as a representation for assignments to assess students' performance (n=10). Since last school year, it was almost impossible to perform in front of an audience. Videos were made as a substitute. In June 2020, Appendix 2 shows nine entries representing the uploaded video files as the first virtual piano recital. A total of four videos of subjects (S) is represented in appendices 2-5. Students recorded the videos to upload in the emuCLOUD², a server using the nextcloud software for creating and sharing files. Videos were announced as final assignments and graded. The implementation of this process was a novelty for all parties. Videos served as a social interaction tool in which students uploaded their video performances to show their results and listen to each other as a piano class when face-to-face meetings were not possible.

Type 7: Representation tool for virtual music competitions (n=2). Videos were recorded for the nationwide held music competition. Different stages/rounds were recorded with one month apart. At the end of that process, the author's students were announced as first prize-winners of the 58th national music competition *Jugend musiziert* 2021 in the category *four hands and for two pianos* AG (age group) V, (average age group 5, 16-17 years of age) (see 58. Bundeswettbewerb *Jugend musiziert* 2021).

²<https://www.bildung-lsa.de/freigaben/emuccloud.html>



Figure 4.4: Author's students at the state competition March 15, 2021

Four 481 piano ensembles with 962 pianists participated in AGV. The number of all participants was 3428, represented in 1714 piano ensembles AG III-VII. This link gives the results of all participants in much detail:

<https://www.jugend-musiziert.org/wettbewerbe/bundeswettbewerb/ergebnisse.html>

In the following link, both participants and the author were interviewed by Friederike Rohmann from MDR Fernsehen, a regional public service television channel owned and operated by Mitteldeutscher Rundfunk Saxony, Saxony-Anhalt, and Thuringia ("Mitteldeutscher Rundfunk", 2021). The interview was conducted and published on May 25 before the results and prize winners were announced. Follow this link to watch the interview: <https://www.youtube.com/watch?v=KIIdSbu-20bU>

Type 8: Using a voice memo app for practicing.

A handy app for teaching piano is the voice memo app. It is available for android and apple smartphones and used to record high quality sounds with waves representing the sound quality. The voice memo app can expand student's perception of tone quality while playing the piano.

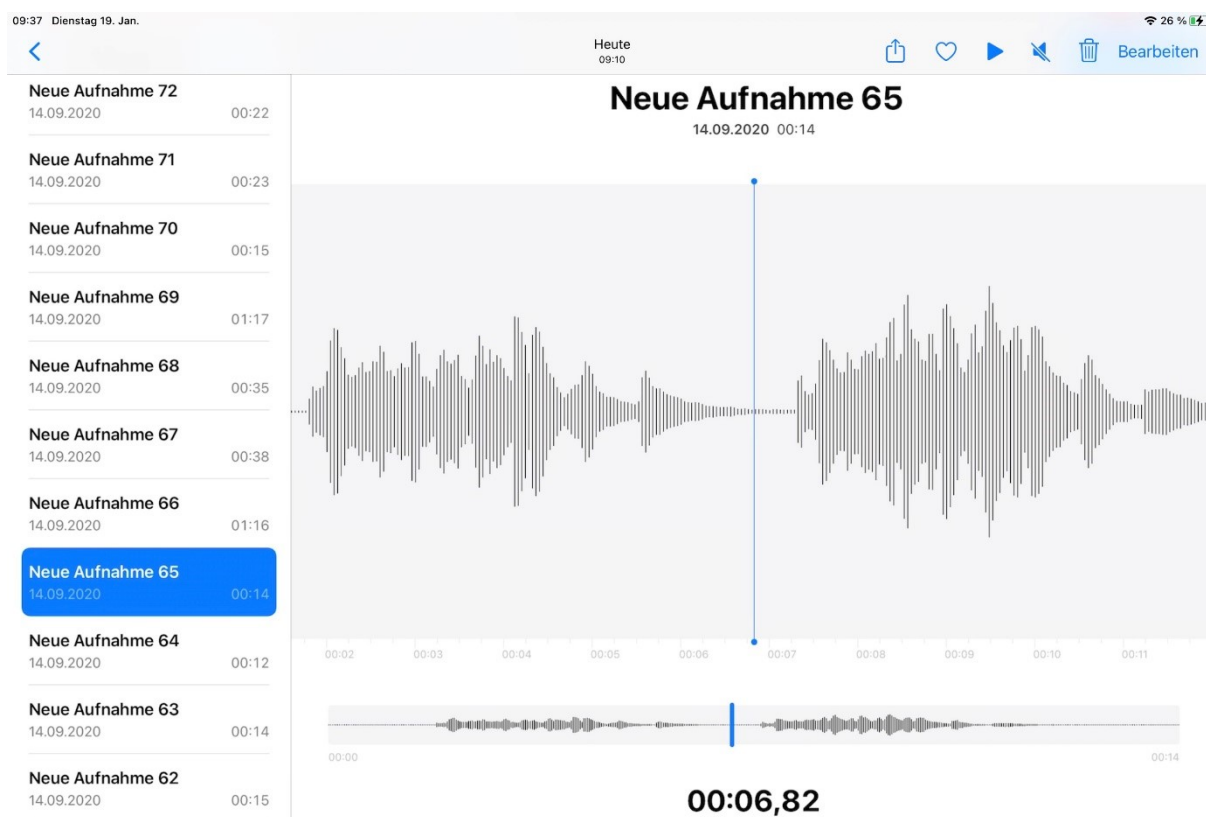


Figure 4.5: Using iPad for voice memo app

Two short sequences are represented in the picture. The music is precisely the same, but with different tone quality. The first passage is played by the student and the second by the teacher. In the latter, there is more guided development in tone and volume. In this small passage, the student had to play a crescendo, which means a gradual increase in loudness and arriving at the highest peak of loudness; he returned playing a decrescendo. So decrescendo is quite the opposite of crescendo. It is a gradual decrease in the loudness of a musical passage. Without using the iPad, the student is just listening to his playing.

The teacher would respond and correct the student's playing. Afterwards, the students would try to improve their piano playing. Sometimes, the learners are aware of the change of the tone quality, but very often, they are not. There is no improvement in playing because the learner cannot implement the process in his playing, which has something to do with awareness. In many cases that depends on previous learners' experiences, the student thinks that he or she is doing the crescendo and decrescendo as the teacher does. Instead he or she plays in the same way as before because his mind is used to his playing and his mind is telling him that he plays in the same way as the teacher does. In other words, the mind is fooling the student's perception. Using such tools as a voice memo gives the learner a visual stimulus and the learner can respond better.

4.2 Cultivating students' skills to study more productively

A self-report questionnaire (Appendix 7) was used containing 32 questions. The 7-point- Likert Scale was applied from strongly disagree (1) to strongly agree (7). The sample (n=10) was divided into five groups, beginner (B), lower intermediate (LI), upper-intermediate (UI), advanced (A), and professional (P).

The five groups represent the learning stage, “the level of music difficulty” (Wolters, 2001, p.15). Wolters divides 15 levels of difficulty based on the average piano learner; level 1, the easiest, represents the first learning year; level 15 being the most advanced. The author sets the learning year compared to the level of proficiency as the following: B=learning year 1-3; LI=learning year 4-6; UI=7-9; A=10-12; P=13-15. However, the subjects do not represent the average learner. They are exceptions based on the selection. The school accepts its students through an aptitude test.

According to the questionnaire, all students have good attitudes to play the piano. Regarding the question 32 “When I play piano, I am feeling good,” all 10th-grade students strongly agree on that with a mean of 6.5. The means of question 17 “It is good for me to perform the piano” is 5.2. There is almost no difference between the score of the beginners and of the advanced students. The group forms, in that sense, a unity.

Table 4.3: Answers of questions 17 and 32 of the self-report questionnaire

Q	Student n = 10	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	Mean
17	It is good for me to perform the piano.	6	5	4	7	4	7	5	6	3	5	5.2
32	When I play the piano, I am feeling good.	6	7	5	7	7	7	7	7	7	5	6.5
	Mean	6	6	4.5	7	5.5	7	6	6.5	5	5	5.9

To measure if and how videos can help for performance improvement, two recitals were set up. Students uploaded their files as an exercise recital (Appendix 4). They got feedback in written form from the teacher and their classmates separately. After one week, they had to upload the video for the final graded assignment (Appendix 5). The improvement of the given grading was compared in Table 4.4. Students had to play a technique program consisting of scales and arpeggios (10points) and one etude (60 points). Ten points were given for digital competence: record the video, name the file and upload the file. All students took advantage of that procedure and scored higher. The students reached 81/100 points in the virtual exercise recital and the final assignment 96,2/100 points. The average improvement is according to the table 19,7% with its lowest by 6% and by 44%.

Table 4.4: Exercise / assignment comparison

Student n = 10	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	Mean
virtual exercise recital (100p)	89	80	88.5	89	84	80	87.5	76	74	62	81
virtual recital assignment (100p)	100	99	98	94	97	93	100	100	91.5	89	96.2
improvement	12%	24%	11%	6%	15%	16%	14%	32%	24%	44%	19.7%

A comparison was made between the video performance and live piano auditions represented in Q 21, 22, 27, and 28 (see Appendix 7). Students, which improved most during the periods of hybrid piano lessons, scored the highest in question 22 “I don’t worry making mistakes when I record a video for a virtual recital.” With a value of 4.3, it represents a neutral statement. The others reached 2.4. It seems that the students who improve most are more relaxed during video recordings. However, they think that they cannot show their full potential in videos.

Table 4.5: Video / live comparison

Q	Student n = 10	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	Mean
21	I don’t worry when performing (live) that I could make mistakes	1	1	2	5	2	1	3	4	1	5	2.6
22	I don’t worry making mistakes when I record a video for a virtual recital	7	1	3	7	4	6	1	2	3	2	3.6
27	I can show my full potential in the video	4	2	5	7	3	1	3	5	2	4	3.6
28	I can develop my full potential in live auditions/concerts	4	5	6	4	1	5	2	5	3	4	3.9

This table shows that 6/10 subjects experience more or less stage fright. One is neutral, and 2/10 somewhat agree to question 21. Question 22 indicates that when videos are recorded for a virtual recital, the tension about making mistakes fades. However, although students worry more about live recitals, they indicate that they develop their full potential in live auditions.

An exception is a student who is one of the winners of this year’s national music competition Jugend musiziert of May 2021. In question 27 “I can show my full potential in the video,” the student scored 2, which means “I strongly disagree,” to show my full potential in videos.

Table 4.6 shows how many levels each student developed in this year. The students S3, S5, and S6, developed two or more levels during this year. This group of students is named “highly improved students” (HIS). The students S2, S6, S7, S8, and S10 are all in the second school year “advanced” or “professional” level; they are marked as “most advanced students” (MAS). Those two groups are compared with all others in several rubrics.

Table 4.6: Student development

Student n = 10	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10
Level School Year 19/20	LI	A	B	B	B	B	A	UI	B	UI
Level School Year 20/21	UI	P	UI	LI	UI	A	P	A	LI	A
Number of Levels improved	1	1	2	1	2	3	1	1	1	1

Levels in order - B: Beginners; LI: Lower Intermediate; UI: Upper-Intermediate; A: Advanced; P: Professional

The HIS group says that they have a better self-regulation than the rest of the students, while the most advanced students are more critical about their self-regulation than all others.

Table 4.7: Video / live comparison

Q	Student group	HIS	others	MAS	others
21	I don't worry when performing (live) that I could make mistakes	2	2.9	2.8	2.4
22	I don't worry making mistakes when I record a video for a virtual recital	4.3	3.9	3	4.3
27	I can show my full potential in the video	3	3.9	3	4.2
28	I can develop my full potential in live auditions/concerts	4	3.9	4.2	3.6

HIS: highly improved students MAS: most advanced students

Comparing Question 21 with 21 and 27 with 28 in Table 4.7 shows that the HIS group is more confident recording videos but still believes that they perform better live than in virtual recitals.

4.3 Using videos as a reflection tool

The following interview were translated by the author. S refers to ‘Student’ and Q stands for ‘Question’.

Questions & answers of the semi-structured interview conducted on May 3, 2021:

Q: Did you only send those videos to the teacher where your piano playing was good?

S: I was able to listen to different recordings of mine. I practiced until I could play everything fluently. I can listen to myself better and pay more attention to my playing. I use videos as self-reflection tools during the whole learning process. I do that in other lessons like organ and violin as well. Videos help me work more independently.

Q: What are the similarities and differences between a live recital and a virtual recital?

S: I am more critical of my playing in virtual recitals than in live performances. In videos, you pay more attention to short passages and little things. I like live recitals better because you focus on the performance as a whole.

It is in a completely different mood. The more I listen to the recordings, the more self-critical I become. In live performance, my hands are shaking; in videos, there is nothing at all. I am nervous in videos too. The more you record, the more frustrated you get. There is great tension. One is tense. You can hear how it was for yourself.

As described in the previous chapter, the competition this year was held as a video competition. Students were very critical of themselves. The following semi-structured interview was conducted after the final submission of the video for the nationally held state competition in which they played in the category piano duo in age group five (16 and 17 years old). They won the first prize nationwide which was outstanding. They were unaware of this when the interview was conducted.

The first interview was held on May 11, 2021 in the morning:

Q: You have done three performances for the competition as videos. What did you experience?

S1: I find recordings very difficult. Sometimes things don’t go that well. It feels like a thousand attempts. I was afraid that small mistakes could ruin everything. For me, there were ups and downs, multiple recording were good at the beginning but that changed.

S2: I was afraid that the video would not be good enough. During the recording, you get restless more and more.

Q: After you were announced as first prize winners in the regional and the state competition, how did you feel about the final video (second stage)?

S1: We tried very hard and were satisfied with what we did. I was pleased in the beginning. Mainly when I first listened to it. However, after listening to it several times, I realized the mistakes and got more critical.

S2: I thought small mistakes were a lot more critical.

Q: We switch now from the state competition to the nationwide held competition. If you compare the two video recordings of the state competition with the nationwide held one, what are your impressions? Are there similarities or differences in your performances?

S1: The competition was supposed to take place live. I was so drained that something was missing – my motivation has decreased significantly; I was very disappointed. If the competition had taken place in Bremen face-to-face, as it was promised, it would have been the greatest for me. I would have been more motivated. I would have been thrilled playing live. Social interaction was missed very much, the anticipation, the nervousness. You can only play it once but then live! You can show your best.

S2: We would have done better in the face-to-face competition.

Q: How do you think about your performance in the national competition?

S1: I was disappointed with the video recording result and I don't expect such a high score and a good result. It's stupid to know we could have done better. If we had done our best and that would be bad, it would be acceptable but that's how we know we weren't good.

Q: Did you have a better feeling after starting the state competition?

S1: I was much more euphoric after the first competition. When we were first accepted, I had a much better sense of self-worth than when I was admitted to the national competition. I expect the worst.

S2: Personally, I always have a terrible feeling.

The students were asked to watch a collection of videos that were taken to follow up their progression. The records included videos from November 2020 until April 2021. One video was taken at a live piano recital in November. The other videos were done in

March and April, including the state and national rounds. On the evening of the same day, when the first interview was held, another Zoom meeting was set up. The purpose was to reflect on the different stages of acquisition.

Q: How was your impression after watching all the videos?

S1: In any case, we've improved a lot.

S2: In November 2020, we were tiny. We developed from a little girl to a lady.

Q: How about your development from March 2021 to April 2021, from the state to the national competition? Do you feel an effect from the state to the national competition?

S1: You can hear the development. We played more grown-up than in the first and second rounds.

Q: Did you learn from each other during the year of playing duo?

S2: When I play solo, my ambition is not that high. The interaction motivates.

S1: I also learned a lot, especially accuracy, which I adopted and copied, and the interaction. It was fun.

5 Discussion

The purpose of this study was to identify the different functions of videos in hybrid piano teaching. The research was done in uncertain times. The action phases were undertaken during this exceptional situation aimed to make piano lessons valuable. Even when almost all regular teaching routines were faded and teaching was not as structured as before, learning was progressing. Following that aim to deliver high-quality teaching, the author pushed her students to their limits, always looking for ways to overcome the problematic situation. In that context, videos served as a reliable tool when the internet connection broke down or was insufficient. However, the impact of videos in different learning environments has been described in other studies related to ICT subjects (Yousef, Chatti, & Schroeder, 2014). However, it was not done in that context of piano teaching.

In chapter 4, videos were classified into eight types of usage where all of them were found very useful. However, there are differences in their perception. In that sense, the video types can be differentiated into two groups, type 1 to type 4 and type 5 to type 8. Type 1 to type 4 serves as learning tools in which learners perceive the tool from outside. They do not have to play the piano, which is a significant marker compared to the other group. In the group type 5 to type 8, students have to play the instrument by themselves. They are more engaged in the process of music-making. Videos as self-reflection tools may cause difficulty in accepting one's limitations. Listening to their playing makes students more critical of themselves, represented in the answers of the semi-structured interview.

Regarding the question "Could you imagine not working with videos in piano class at all?" all students denied the answer. Videos were used initially as a quick fix to compensate for the insufficient internet quality. However, after one year of hybrid piano teaching, videos became one of the most used tools. In that context, eight different types were described, which impacted piano acquisition and performance during that time of extreme uncertainty.

One of the key findings is how videos can be used as a self-reflection tool. Students watch their performance from a retro perspective. This routine can improve their playing in the short term and further their self-esteem for a long time. Practicing with videos helps students to become better, as shown in Table 4.4. On the other hand, it seems the better students become, the more self-critical they get. However, that helps them to be a better performer. In the interviews taken with the prize-winners, they were not aware of their excellent performance. They set such higher goals and lost a bit of their self-esteem. After reflecting on the development of their playing, they got a better perspective about their performance. In that respect, it is presumed that videos can further self-esteem when given in the context of video portfolios. Such portfolios

have to be conducted and moderated by the teacher to emphasize and reflect on the progress and learning process.

Students explained their positive impact with the following words “I was able to listen to different recordings of mine,” “I practiced until everything went smoothly,” “I can listen better to myself and pay more attention to my playing,” “I use videos as self-reflection tools during the whole learning process,” “I do that in other lessons like organ and violin as well,” “Videos help me to work more independently.” That represents the value of piano teaching. The author realized an enormous development in piano skills of most students during that time. One student was developing exceptionally well. She was growing from a beginner to an advanced piano player. In a conversation, she explained that she recorded it to send it to her grandma twice a week as a video whenever she enjoyed a passage in her piano music.

The students’ positive feedback on using videos as a reflection tool to learn music independently suggests using and embedding this strategy more often in traditional teaching. Considering all these findings, it was evident that videos can expand and enrich learning opportunities in piano lessons.

The HIS group studied the most intensive during this year and got used to the video as a tool. They record pieces a couple of times until their video performance had no or almost no mistakes. They are not so afraid of making mistakes as in live performances. Anyhow, they replay their videos and see their performance quite critically. It is presumed that this can be one reason why they improved so fast. On the contrary, they remember their live performances, when the audience applauded, and friends and family had been proud of them.

6 Conclusion and Vision

The aim of this paper focused primarily on videos in piano teaching. It was described how videos can influence the learning process and how the videos function as a tool to reflect on one's own performance. The idea of using videos in different settings of teaching piano was born on a need-based situation caused by the epidemic situation of COVID-19.

However, the effect was so huge that all students took advantage of that situation - as the data has proven. The two first prize-winners have shown that hybrid piano teaching can lead to success. It was the first time that they got so far. However, all students expressed that they want to play in a normal situation where playing instruments in live concerts are possible several times. Social interaction was always missed.

Nevertheless, the development of this hybrid piano teaching method served well as a pragmatic solution, fighting a temporary crisis, struggling with technical limitations. The authors' vision is that technology-centered discussion would fade. The easy use of technology in education must be developed to access and use students' tools for learning. Educational technology has to be taken to open teaching avenues where educators overcome the prejudices against educational technology in which technology is seen in the first place.

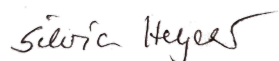
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Author's Declaration

I hereby declare that I have written this thesis independently and that all contributions of other authors and supporters have been referenced. The thesis has been written in accordance with the requirements for graduation theses of the Institute of Education of the University of Tartu and is in compliance with good academic practices.



Silvia Heyder

June 5, 2021

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Appendix 1

conditions	the traditional piano lesson at Landesschule Pforta	Covid-19 setting First school closure (first action period)	Covid-19 setting Second school closure (third action period)
communication	face to face during the lesson	video conference, additional via Telegram	Microsoft Teams To be used as a video conference tool and chat to write down the tasks for the next session, upload short videos as assignments
instruments	two upright pianos or grand pianos	students' instrument at home: an upright piano or e-piano	students' instruments at home: an upright piano, grand piano or e-piano
time	regular schedule	dependent on the internet connection	regular schedule
dimension place	three dimensional school	two dimensional students' home	two dimensional students' home
duration of lesson	30-45 min per week	25-30 min per week	

Appendix 2

The screenshot shows a Nextcloud file manager interface. The top navigation bar is orange and contains the Nextcloud logo, a search icon, and the text 'Angemeldet als: silviaheyder' and 'emuCLOUD-ID: silviaheyder@emucloud.bildung-isa.de/nextcloud'. Below the navigation bar, there is a left sidebar with navigation options like 'Alle Dateien', 'Neueste', 'Favoriten', and 'Freigaben'. The main area shows a folder hierarchy: 'Klavier 9m Schuljahr 19_20' > 'Klavier 1. Virt-Vorspiel 9'. A table lists 9 files, each with a checkbox, a play button icon, a name, a size, and a 'Geändert' (Modified) date. All files were modified 'vor einem Jahr' (one year ago).

Name	Größe	Geändert
S1 Wohntemperiertes Klavier, Präludium 17.mp4	174,3 MB	vor einem Jahr
S2 an einem Alten Brunnen.mp4	260,9 MB	vor einem Jahr
S3 Burgmüller, Les Sylphes.mov	71,9 MB	vor einem Jahr
S4 VID-20200511-WA0003.mp4	58,5 MB	vor einem Jahr
S5 Erinnerung.MOV	120,8 MB	vor einem Jahr
S6 Ballade v. Burgmüller.mov	248,8 MB	vor einem Jahr
S7 Nocturne op. 55 Nr.1.mp4	548,7 MB	vor einem Jahr
S8 Étude C-Dur.MOV	6,1 MB	vor einem Jahr
S9 Beethoven.mp4	34,4 MB	vor einem Jahr
9 Dateien	1,5 GB	

Appendix 3

The screenshot shows the emucloud interface. The top navigation bar is orange and contains the emucloud logo, navigation icons, a search bar, and user information: 'Angemeldet als: silviaheyder' and 'emuCLOUD-ID: silviaheyder@emucloud.bildung-isa.de/nextcloud'. There are also links for 'Zurück zum Bildungsserver'.

The left sidebar shows a file tree with categories: 'Alle Dateien', 'Neueste', 'Favoriten', and 'Freigaben'. Under 'Freigaben', there are sub-options: 'Von Ihnen geteilt', 'Mit Ihnen geteilt', 'Geteilt über einen Link', 'Gelöschte Freigaben', and 'Ausstehende Freigaben'.

The main content area shows a folder named 'Klavier9m2.VorspielNeu...' containing a list of 9 files. The table below summarizes the data from the screenshot:

Name	Größe	Geändert
S1_Lv.Beethoven_Sonateop.31-2AllegrettoIMG_0460.MOV	270 MB	vor einem Jahr
S2_K.H.Pick_Das stolze tapfere Schneiderlein.mp4	247,3 MB	vor einem Jahr
S3_A.Chatschaturjan_Andantino.mp4	557,4 MB	vor einem Jahr
S4_P.Tschaikowsky_Lerchengesang.mov	50,4 MB	vor einem Jahr
S5_Gretschinow_Betrübt.MOV	91,9 MB	vor einem Jahr
S6_C.Debussy_The little Shepherd.mov	247,7 MB	vor einem Jahr
S7_D.Schostakowitsch_Phantastischer Tanz2.MTS	164,7 MB	vor einem Jahr
S8_F.Kuhlau_Sonatine C-Dur_2. Satz.MOV	157,9 MB	vor einem Jahr
S9_F.Chopin_Mazurka, Op. 17 Nr.4.mp4	560,4 MB	vor einem Jahr
9 Dateien		2,3 GB

Appendix 4

The screenshot shows a Nextcloud file manager interface. The top header is orange and contains the Nextcloud logo, navigation icons, and user information: 'Angemeldet als: silviaheyder' and 'emuCLOUD-ID: silviaheyder@emucloud.bildung-isa.de/nextcloud'. There are buttons for 'Zurück zum Bildungsserver' on both sides.

The left sidebar shows navigation options: 'Alle Dateien', 'Neueste', 'Favoriten', 'Freigaben' (with sub-options for sharing), 'Gelöschte Freigaben', and 'Ausstehende Freigaben'. At the bottom, it shows 'Gelöschte Dateien' and '10.5 GB verwendet'.

The main area displays a folder named 'Klavier10_Technik_Übun...'. Below the folder name is a table of files:

Name	Größe	Geändert
Beispielvideo_Technik_G-Dur.MOV	62 MB	vor einem Monat
S1_Technik_D-Dur.mov	36,1 MB	vor einem Monat
S2_Etüde_a-moll.mp4	143 MB	vor einem Monat
S2_Technik_E-Dur.mp4	88,7 MB	vor einem Monat
S3_Burgmüller_Etüde_c-moll.mp4	8,4 MB	vor einem Monat
S3_Technik_E-Dur.mp4	6,4 MB	vor einem Monat
S4_F.Liszt_Etüde_d-Moll.mov	115,3 MB	vor einem Monat
S4_Technik_E-Dur.mov	89,3 MB	vor einem Monat
S5_Etüde_E-Dur.mp4	7,5 MB	vor einer Stunde
S5_Technik_Edur.mp4	9,4 MB	vor einer Stunde
S6_H.Bertini_Etüde.MOV	116,7 MB	vor einem Monat
S6_Technik_E-Dur.MOV	108 MB	vor einem Monat
S7_A.N. Skrjabin_Etüde_cis-Moll.mov	442,1 MB	vor einem Monat
S7_Technik_D-Dur.MOV	28,7 MB	vor einem Monat
S8_Jugendetüde_Nr.2_a-Moll.mp4	228,3 MB	vor einem Monat
S8_Technik_G-Dur.mp4	147,7 MB	vor einem Monat
S9_Burgmüller_Etüde_Sylphen.MP4	18,7 MB	vor einem Monat
S9_Technik_E-Dur.MOV	78,4 MB	vor einem Monat
S10_F.Chopin_Etüde_As-Dur.mp4	263,3 MB	vor einem Monat
S10_Technik_Es-Dur.mp4	93,4 MB	vor einem Monat

At the bottom of the table, it shows '20 Dateien' and '2 GB'.

Appendix 5

The screenshot displays the Nextcloud file manager interface. The top header shows the user is logged in as 'silviaheyder' with the email 'silviaheyder@emucloud.bildung-lsa.de/nextcloud'. The breadcrumb path is 'Klavier10_Technik_bewe...'. The left sidebar contains navigation options: 'Alle Dateien', 'Neueste', 'Favoriten', 'Freigaben', 'Von Ihnen geteilt', 'Mit Ihnen geteilt', 'Geteilt über einen Link', 'Gelöschte Freigaben', and 'Ausstehende Freigaben'. The main area shows a list of 19 files, each with a play button icon, a checkbox, and a three-dot menu icon. The files are sorted by name and include details on size and modification date.

Name	Größe	Geändert
S1_Technik_D-Dur.MP4	26,6 MB	vor einem Monat
S2_Etüde_a-Moll.mp4	76,4 MB	vor einem Monat
S2_Technik_E-Dur.mp4	103,3 MB	vor einem Monat
S3_Burgmüller_Etüde_c-moll.mp4	191,4 MB	vor einem Monat
S3_Technik_E-Dur.mp4	99,4 MB	vor einem Monat
S4_F.Liszt_Etüde.mov	115,3 MB	vor einem Monat
S4_Technik_E-Dur.MOV	51 MB	vor einem Monat
S5_Lemoine_Etüde_C-Dur.MOV	51,4 MB	vor einem Tag
S5_Technik_E-Dur.MOV	76,5 MB	vor einem Tag
S6_H.Bertini_Etüde.mov	79,3 MB	vor einem Monat
S6_Technik_E-Dur.mov	41,8 MB	vor einem Monat
S7_A. N. Skjabin_cis-Moll.mov	323,1 MB	vor einem Monat
S7_Technik_D-Dur.mov	80,5 MB	vor einem Monat
S8_F.Liszt_Etüde.mp4	111,3 MB	vor einem Monat
S8_Technik_G-Dur.mp4	63,5 MB	vor einem Monat
S9_Burgmüller_Etüde_g-Moll.mp4	21,6 MB	vor einem Monat
S9_Technik_E-Dur.MOV	5,9 MB	vor einem Monat
S10_F.Chopin_Etüde_As-Dur.mp4	294,7 MB	vor einem Monat
S10_Technik_Es-Dur.mp4	116,6 MB	vor einem Monat
19 Dateien		1,9 GB

Appendix 6



Figure 6.1: Picture taken during the virtual state contest *Jugend musiziert* 2021

Appendix 7

Q	Student n=10	1	2	3	4	5	6	7	8	9	10	Mean	SD
1	I have had positive experiences performing music in the past	5	6	5	6	3	6	3	6	4	5	4.9	1.1
2	I have improved my piano performance skills by watching YouTube videos of my current music pieces	7	6	5	7	6	6	6	3	2	4	5.2	1.6
3	My classmates think that I am good a good piano performer	5	7	5	4	4	6	6	5	7	5	5.4	1
4	I have had positive experiences performing in large ensembles	5	6	6	7	5	7	7	5	5	5	5.8	0.9
5	I can improve my piano playing well by watching someone who can play well (siblings, parents, classmates, etc.)	3	2	7	7	6	4	6	6	3	5	4.9	1.7
6	I have had positive experiences performing music solo	6	5	4	6	3	7	5	6	2	3	4.7	1.6
7	Members of my family believe I perform well	7	6	7	5	6	7	7	5	7	6	6.3	0.8
8	I have had positive experience performing easy piano pieces	3	3	5	6	5	5	6	6	5	5	4.9	1
9	I know that by practicing more, I do better in auditions	7	6	7	7	6	7	3	6	7	6	6.2	1.2
10	I have had good experiences with auditioning playing challenging pieces	5	6	5	6	5	4	5	5	2	4	4.7	1.1
11	In order to perform better I took other classmates or other peers as role models	7	2	3	6	3	7	2	5	2	2	3.9	2
12	I have mastered challenges within difficult pieces through regular good practice	7	6	6	7	7	5	7	6	7	4	6.2	1
13	So far, I have always received good feedback after auditions	6	6	6	5	5	6	3	5	7	5	5.4	1
14	I have developed a good practice routine to prepare for auditions	5	5	4	7	6	1	2	6	1	2	3.9	2.1
15	I have learned to get my nervousness/stage fright under control	3	1	5	4	1	3	6	5	1	4	3.3	1.7
16	I have had good experiences in auditioning with smaller ensembles (2-10 players)	6	6	4	6	6	7	4	6	7	6	5.8	1
17	It is good for me to perform the piano	6	5	4	7	4	7	5	6	3	5	5.2	1.3
18	I enjoy auditioning	4	5	5	4	2	7	6	6	2	3	4.4	1.6
19	I have fond memories of my auditions	5	4	4	5	3	7	7	6	2	5	4.8	1.5
20	By recording videos as video performance, I can better control my nervousness	6	2	6	7	6	4	6	4	6	6	5.3	1.4
21	I don't worry when performing (live) that I could make mistakes	1	1	3	5	2	1	3	4	1	5	2.6	1.6
22	I don't worry making mistakes when I record a video for a virtual recital	7	1	3	7	4	6	1	2	3	2	3.6	2.2
23	I repeat the record of the video for the virtual recital until it has no mistakes	5	6	6	7	5	1	5	6	6	7	5.4	1.6
24	I watch other classmates with similar skills as mine play the piano and wonder if I could do the piano piece too	5	6	5	7	6	7	7	5	7	4	5.9	1
25	I do not worry about making mistakes during a performance	1	1	3	5	2	3	5	3	2	3	2.8	1.3
26	Due to the virtual practice recital, I improved my performance skills in the final assessed virtual recital	5	6	5	7	3	1	2	6	5	5	4.5	1.8
27	I can show my full potential in the video	4	2	5	7	3	1	3	5	2	4	3.6	1.7
28	I can develop my full potential in live auditions/concerts	4	5	6	4	1	5	2	5	3	4	3.9	1.5
29	Videos help me to practice more self-reflective and therefore improve my performance in the future	5	5	6	7	6	5	5	6	5	4	5.4	0.8
30	After performing (live) I always feel bad	4	3	6	3	4	2	4	2	4	6	3.8	1.3
31	I have a good feeling when I watch the video of the technique recital (etude and technique)	6	5	5	6	3	1	6	6	3	2	4.3	1.8
32	When I play the piano, I am feeling good	6	7	5	7	7	7	7	7	7	5	6.5	0.8
	Mean	5	4	5	6	4	5	5	5	4	4	4.8	1.4

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