INTERNATIONAL
TRUMPET RESEARCH
CENTER

International Trumpet Research Journal

Volume 2, Issue 1
December 2025

Use of Technology in Spanish Trumpet Classrooms

Carles Camarasa Botella

carlescamarasa@gmail.com

Programa de Doctorat en Industries de la Comunicació i Culturals - Departament de Comunicació Audiovisual, Documentació e Història de l'Art - Universitat Politècnica de València - Camí de Vera, s/n, 46022 (València), Espanya

Jordi Albert Gargallo

jordi.albert@unay.edu.mx

Universidad de las Artes de Yucatán

INTERNATIONAL
TRUMPET RESEARCH
CENTER

Use of Technology in Spanish Trumpet Classrooms

Carles Camarasa Botella
Programa de Doctorado en Industrias de la Comunicación y Culturales
Universitat Politècnica de València[1]

Jordi Albert Gargallo
Universidad de las Artes de Yucatán

Abstract

By holding interviews with 13 teachers, this research looks at how technology is used in teaching the trumpet in different conservatories in Spain. The findings illustrate a paradoxical situation: on the one hand, digital tools are widely used for management and scheduling; on the other hand, they are largely absent from the fundamental moments of learning, deliberate practice, and self-reflection. Critical tensions are identified between external validation (apps) and internal listening, as well as between gamification and attentional dispersion. In conclusion, the need for a hybrid design framework that integrates analog writing with contextual Artificial Intelligence has emerged. This framework could be a solution to promote metacognition while receiving technical analysis of the student's development.

Keywords: Trumpet pedagogy; self-regulated learning; educational technology; learning journal; artificial intelligence.

[1] *Programa de Doctorat en Industries de la Comunicació i Culturals - Departament de Comunicació Audiovisual, Documentació e Història de l'Art - Universitat Politècnica de València - Camí de Vera, s/n, 46022 (València), Espanya.*

Abstract (Spanish)

Mediante entrevistas a 13 profesores, esta investigación analiza cómo se utiliza la tecnología en la enseñanza de la trompeta en distintos conservatorios de España. Los resultados ilustran una situación paradójica: por un lado, las herramientas digitales se usan ampliamente para la gestión y la organización; por otro, están en gran medida ausentes de los momentos fundamentales del aprendizaje, la práctica deliberada y la autorreflexión. Se identifican tensiones críticas entre la validación externa (aplicaciones) y la escucha interna, así como entre la gamificación y la dispersión atencional. En conclusión, surge la necesidad de un marco de diseño híbrido que integre la escritura analógica con la Inteligencia Artificial contextual. Este marco podría ser una solución para promover la metacognición mientras se recibe un análisis técnico del desarrollo del estudiante.

Palabras clave: pedagogía de la trompeta; aprendizaje autorregulado; tecnología educativa; diario de aprendizaje; inteligencia artificial.

Introduction

Trumpet teaching, particularly in the classical Conservatory manner, sometimes seems frozen in time. We remain anchored to methods from the 19th century (Arban, 1864) and early 20th century (Clarke, 1912; Colin, 1980; Schlossberg, 1965), a golden age where piston mechanics finally opened the doors to total chromaticism. However, while the instrument evolved, pedagogy did not always keep pace with it.

For almost a century – at least since 1928, as noted by How et al. (2022) – research has attempted to decipher what makes practice effective. First, we examined how to break down the score into parts, comparing whole vs. part practice (Brown, 1928). Then, performance psychology started to compare practice times and their influence on learning (Rubin-Rabson, 1940). Alternatively, later, different approaches to error handling, such as negative study (Johnson, 1962), were explored.

Strangely, with all the progress we have made, technology barely appears in pedagogical theory. We have indeed incorporated ideas from performance psychology (Ericsson, 1998; Ericsson et al., 1993) and neuroscience (Altenmüller & Jabusch, 2010), and we have updated traditional didactics (Albert Gargallo, 2017). However, we still lack a conscious integration of technology in the pedagogy of trumpet learning.

Relevance of self-regulated learning in music

From a cognitivist viewpoint, success lies in understanding the process itself, rather than just achieving an excellent performance. Self-regulation aims to stimulate the processes of self-awareness and improvement. (Zimmerman, 2002) states that “Self-regulation refers to self-generated thoughts, feelings, and behaviors that are oriented to attaining goals”. (Bandura, 1991) distinguishes three key stages for SRL, which are observing, judging, and reacting.

SRL is interesting for music students because they spend more time practicing alone than with others. Furthermore, improvement in performance does not follow a straight line; rather, formal and informal learning constantly mix. In this context, the capacity to self-regulate learning becomes fundamental for improving instrumental performance (McPherson & Renwick, 2011).

Self-regulated learning (SRL) is understood as an active process in which students plan, monitor, and evaluate their own progress (Mehmood et al., 2025). Those who manage to self-regulate define clearer goals and manage their efforts better, allowing them to achieve better results without losing motivation over time.

Several music pedagogy research publications highlight an increasing concern in using SRL to enhance the effectiveness of instrumental practice and the subsequent incorporation of instruments such as LJs that serve as a medium of reflection and progress tracking (dos Santos Silva & Marinho, 2025).

In formal music education –including undergraduate, postgraduate, and professional students – research has focused on processes such as goal setting, strategy selection and adaptation, time management, and continuous self-evaluation (dos Santos Silva & Marinho, 2025).

What tools can help develop SRL consciously in the music classroom? This question deserves attention. One of the most promising options is the learning journal.

The learning journal as a metacognitive tool

The learning journal (LJ) is a metacognitive tool that allows for planning goals, tracking progress, and evaluating results (Pintrich, 2000; Zimmerman & Schunk, 2011). When students record their practice systematically, they are better able to understand their actual progress. This writing stimulates critical reflection and helps maintain motivation (Moon, 2006; Schmitz & Wiese, 2006). In instrumental practice, these journals are particularly effective during preparation cycles –such as concerts, auditions, and exams – because they enable adjustments to strategy from one session to the next (McPherson & Renwick, 2011).

At all levels of education, LJs have been a good vehicle to promote student SRL (Mendoza Villacorta & Palacios Garay, 2023). The application of LJs is part of the "third wave" of SRL measurement, which involves collecting data in the classroom and implementing pedagogical interventions (Panadero et al., 2016). In other words, the LJ fulfills a double function: on one hand, it gathers information about the process; and on the other, it serves to apply pedagogical interventions (Mendoza Villacorta & Palacios Garay, 2023). Furthermore, its use commits the student to take some distance from the process and self-reflect on their progress and results

recurrently. These iterations of planning, monitoring, and adjustment favor their evolution (Mendoza Villacorta & Palacios Garay, 2023).

Finally, the use of LJ seems to gain effectiveness when combined with specific instruction of SRL. In that case, the student detects their personal resources as well as their practice capacity (dos Santos Silva & Marinho, 2025). Current digital tools open new possibilities to reinforce reflection and self-regulation.

Context of technology integration in the trumpet classroom

The Association for Educational Communication and Technology (AECT) defines educational technology as "the study and ethical practice of facilitating learning and improving performance by creating, using, and managing appropriate technological processes and resources" (Januszewski & Molenda, 2008). This definition sees technology as not only a tool but also as a separate educational medium. Therefore, its use should be guided by ethical principles, and it opens up new educational possibilities. To illustrate, in music, Webster (2012) suggests using technology to make the students' mental process more active, thus developing their creativity, self-reflection, and independence.

Bauer (2020) distinguishes between three types of educational technology: desktop computers, laptops, and lightweight devices (such as smartphones and tablets). This author highlights the proliferation of lightweight devices, which students already own and use daily. These devices combine portability with cloud computing and SaaS applications, offering realistic pathways to digitalize musical learning.

However, when discussing educational technology, we often think only of what happens inside the classroom. Ed-tech is a concept that emerged a few years ago, which, according to West (2023), "includes software, systems, content, platforms, connections, networks, and online apps that render hardware useful for educational purposes… not only devices but processes and services".

However, it is equally important to note that the term 'ed-tech' was devised with business objectives in view, thereby implying that the field of education might be somewhat constrained.

To begin with, the very first purpose of the initiative was to provide money to startup incubators and venture capital, instead of meeting the requirements (West, 2023).

The COVID-19 pandemic accelerated the spread of the term ed-tech due to the sanitary need to maintain physical distance. At that exceptional moment, technology fulfilled two functions: reinforcing habitual pedagogical practices and temporarily replacing face-to-face teaching.

Hence, the importance of investigating what really happens inside the classroom. Through these interviews, we aim to understand how technology is being utilized, which practices are effective, and which ones may be outdated or even detrimental.

Methods

For this study, we have chosen a qualitative and exploratory approach. We wanted to understand firsthand how technology is integrated into trumpet classes and what the teachers' vision is for this integration. We interviewed thirteen teachers from five autonomous communities (Aragon, Cantabria, Castilla-La Mancha, Castilla y León, and Madrid). The ultimate intention is for these findings to inform the design of didactic tools with a pedagogical basis, while also being realistic in relation to the everyday classroom experience.

The participants' choices were intentional, aiming to have varied backgrounds in education and different areas. They managed to contact twenty out of twenty-six possible participants. The thirteen agreed to participate in the research study, whereas the seven declined, citing reasons such as technical difficulties and being busy as their reasons for refusal. The remaining six persons were not accessible because there was not enough time for data collection.

The semi-structured interview was designed ad hoc with five thematic blocks and twenty-two open questions: teacher profile (6 questions), current use of technology (5 questions), opinions on its application (5 questions), needs and expectations (5 questions), and other comments (1 question). The three central blocks served to establish the categories of analysis, which were organized into three axes: current use, teacher opinions, and needs and expectations.

From the three intermediate blocks, the categories used in the data analysis were defined, organized around three principal axes: current use of technology, teacher opinions, and needs and expectations. The first and fifth blocks were developed to provide background to the information collected and to present a more transparent picture of the participants.

Results

Teacher Profile

The thirteen participating teachers present varied professional trajectories, although experienced profiles predominate. They can be grouped into three levels: a first group with more than twenty years of teaching (P2, P3, P7, P10, P12, P13), a second group with seniority between ten and twenty years (P5, P6, P9), and a third group with less than ten years (P1, P4, P8, P11).

Table 1: Teacher profile of the interviewed professors. Source: own elaboration, based on the interviews conducted.

ID	Years of Experience	Perceived Use of Technology
P1	3 years.	Balanced use, adaptable to the student.
P2	26 years.	Moderate use (6 or 7 out of 10).
P3	27 years.	Extensive use in class, which increased from the COVID pandemic with Teams.
P4	3 years.	Quite a bit; incorporated it from the beginning to avoid monotony.
P5	13 discontinuous years.	Intensive use, especially of electronic devices and applications.
P6	21 years.	Retention of information outside the classroom.
P7	25 years.	Used very little until confinement; now sees it as enrichment.
P8	7 years.	Limited use, mainly as a database and tuner/drone.
P9	8 years.	Perceived as little, but facilitating classroom management and score editing.
P10	25 years.	Positive and progressive use; seeks productivity.

P11	5 years.	In almost all classes, more than average.
P12	25 years.	High and well-intentioned use; seeks utilization.
P13	25 years.	Moderate and pedagogical use; focused on attentive self-listening.

The predominant scope of action is the public professional conservatory, with the particularity of P5, which provides the vision from higher education. Geographically, the sample offers a representative diversity covering five autonomous communities: Aragon (1), Cantabria (1), Castilla-La Mancha (1), Castilla y León (5), and Madrid (5).

Regarding the technological climate, teachers describe an environment where digitization is still incipient. However, far from showing rejection, the collective maintains a constructive stance: technology is welcome as long as it serves as a tool and not an end in itself. This generalized receptivity only finds nuances of caution in voices like those of P3 and P13, who warn about the risk of "digital saturation" that may overwhelm families.

Current use of technology

The current use of technology in the trumpet classroom is oriented mainly towards logistical support functions rather than pedagogical ones. Several teachers (P1, P7, P10, P11) mention the habitual use of tablets, especially to replace printed material or solve student forgetfulness. As P1 pointed out, “others, instead of printing, download the materials, and read the score on the tablet”. Digital whiteboards are also present in several centers. However, the majority recognize their limited use due to a lack of training, as “they do not really explain to you how things should be done either” (P4).

Digital tools that replace analog resources, such as metronomes and tuners, are widely used as part of the daily classroom routine. TonalEnergy Tuner is mentioned as the most widely used application, valued for its intuitive visual interface and the ability to generate drones or work on pure intonation.

The differences observed in technological integration seem to depend more on the teachers' personal concerns than on their age. Some participants with long teaching careers, such as P3, P10, or P12, have digitized their evaluation and class management systems, while others, who are younger, have barely begun to explore basic tools.

In general, all interviewees express an intention to utilize technology for didactic purposes, beyond merely replacing paper or physical materials. Several indicated that adaptations implemented during the pandemic—such as managing digitized files or using pre-recorded content—have become part of their habitual practice. As P3 summarized: "We have gone from using little technology to using iPad, big screen, Teams…".

Table 2 presents the main applications used, the purposes to which they are applied, and the teachers who were interviewed.

Table 2: Recognized use of technological elements in the trumpet classroom. Source: own elaboration, based on the interviews conducted.

Element/platform	Use/Summary description	Sources where it appears
Tablets/iPads	Scores, playback, annotations, management	P1, P2, P3, P4, P5, P7, P9, P10, P11, P12 and P13.
Digital whiteboards/screens (Smart)	Projection of scores and videos in the classroom	P3, P8, P9, P10, P11, P13.
TonalEnergy Tuner (TE)	Tuner/metronome with visual feedback and drones	P4, P5, P6, P8, P9, P10, P12, P13.
Metronome/tuner (generic)	Basic class resource	P1, P3, P4, P7, P8, P9, P10, P11, P13.
Audio/video recording (self-listening)	In class and/or for homework	P2, P3, P5, P6, P7, P8, P9, P10, P11, P12, P13.
YouTube / Spotify / VLC	Guided listening, play-along, models	P1, P2, P3, P4, P5, P6, P7, P9, P10, P11, P13.
Loop/transposition apps	Looping, backing tracks, transport for study	P1, P2, P3, P5, P7, P10.

Digital managers/scores	Digital consultation and annotation	P1, P7, P9, P10, P12.
Storage (Drive/OneDrive)	Folders per student, materials, and audios	P1, P3, P5, P6, P8, P9, P10, P11, P13.
Institutional platforms	Classroom management, files, tasks, and evaluation	P2, P3, P4, P5, P6, P7, P8, P11, P12, P13.
Communication (WhatsApp)	Messaging with families/students	P1, P2, P3, P4, P5, P7, P8, P9, P10, P11, P12, P13.
Digital diary/class notes	Summary per session, PDF to Teams	P2, P4, P5, P8, P12, P13
Digital evaluation (Excel)	Rubrics, averages, traceability	P4, P10, P11.
Videoconference	Occasional classes/meetings	P2, P3, P4, P6, P7, P9, P10, P11, P12.
Tablet as “lifesaver”	Quick alternative to paper	P1, P9, P10, P11, P12.

The dataset reflects that technology has been generally spread in the classroom. However, a significant portion of that technology is used solely for logistical or management purposes. Besides that, the use that is made most of the time is based on pedagogical criteria, and it also considers UNESCO criteria (West, 2023).

In summary, an emerging use of technology is evident, particularly since the COVID-19 confinement period in 2020. This technological structure, subordinated to learning, allows establishing a guide towards digital LJ applications that stimulate SRL processes.

Opinions on the technology used

The opinions of the interviewed teachers regarding the technology they use are generally optimistic, provided its use is subordinated to pedagogical interest. Among the main advantages, greater student involvement stands out (P11), as well as an improvement in motivation, especially in initial courses, thanks to visual feedback and gamification (P4, P5). Likewise, productivity (P10) and efficiency in document and communicative management (P7, P9) are valued.

However, significant limitations are also pointed out. The most recurring criticism of technology inherited from confinement is latency and low audio quality in video conferences, which prevents synchronous instrumental teaching (P4). Additionally, there is concern about the "digital saturation" of families (P3, P13) and the risk of attentional dispersion in the classroom (P7). There is also fear that dependence on visual tools (tuners) may inhibit the development of the inner ear and pulse (P4).

Needs and expectations

The analysis of the interviews reveals a series of uncovered needs that justify the implementation of new tools.

Monitoring an autonomous study

The main challenge identified is the lack of information about what happens during the "6 days and 23 hours" that the student spends outside the classroom (P3, P10). Being unable to be constantly present (P5), teachers lack data on the quantity, consistency, and, above all, the quality of study (P1, P3). To alleviate this, some teachers have implemented paper or digital records (P4, P13, P9), although they recognize the difficulty of maintaining these habits without saturating families.

Fostering self-regulation strategies

There is a demand for tools that foster metacognition and volition. The use of visual tuners (TonalEnergy) and harmonic bases (Play-along, Minus-one, etc.) is already employed to improve sound awareness and motivation (P4, P5, P10, P1, P7). Likewise, recording is consolidated as a key resource for self-evaluation, forcing the student to face their own errors (P9, P13, P3).

Challenges for tool design

The main barrier to the adoption of new solutions is digital oversaturation. Teachers (P3, P9, P13) warn that any new proposal must avoid increasing the noise of notifications that families already suffer. In this sense, the possibility of hybrid or tangible tools that allow differentiating the study space from digital leisure is valued.

Discussion

The discussion synthesizes how the Learning Journal (LJ), especially in digital or hybrid format, can fill the gaps identified by teachers and project future innovations.

The LJ as a solution to monitoring and self-reflection

The LJ provides a structured solution to the problem of inadequate practice tracking at home. It helps gather the documentation of motivational, behavioral, and metacognitive processes (Mendoza Villacorta & Palacios Garay, 2023). That abyss of "6 days and 23 hours" was pointed out by P3 and P10. The practice of journaling is effective in enhancing practice routines and increasing reflective practices among conservatory students (How et al., 2022).

By implementing an LJ, the teacher is offering a strategy that, combined with explicit training, can lead to a substantial improvement in students' metacognitive skills (How et al., 2022; Mendoza Villacorta & Palacios Garay, 2023), helping them become aware of the quality of their study, as demanded by P5.

The future of the LJ in the trumpet: integration with AI

The need expressed by several teachers for a system that analyzes and reports on the quality of home study (tuning, tempo, sound quality...) suggests an evolution of the LJ towards a tool assisted by Artificial Intelligence (AI) (P1, P4, P5, P9, P10, and P13).

However, a purely mechanical or "objective" analysis (such as pitch intonation or metronome) is not sought; instead, an AI capable of interpreting complex pedagogical guidelines is desired. This tool would function as a "home study co-pilot" (P5), offering contextualized feedback: not just whether the note is in tune, but also whether the sound quality (resonant vs. tight) meets the aesthetic criteria defined by the teacher (P9, P13). Technology, thus, would not replace the teacher's judgment but would extend their criteria to the home.

Pedagogical implications and the hybrid model

To overcome digital saturation (P13, P3) while retaining the power of data analysis, a hybrid LJ model is suggested. In this model, metacognitive reflection (goal setting, self-evaluation)

is facilitated through the use of paper, thereby leveraging the brain's memory functions through writing and the reflective pause.

The challenge of "friction" in digitizing this data can be solved through optical character recognition (OCR) or computer vision technologies: the student simply photographs their notebook, and the AI processes that information to configure the listening session. In this way, it is guaranteed that technology serves pedagogy, maintaining the "tangibility" of the written commitment without losing digital monitoring capacity.

To actually put this model into practice, it is necessary that teachers receive specific training centered on the pedagogical use of these instruments, going beyond the bureaucratic aspect (P4, P5). The most appropriate theoretical framework to back up this proposal is still Zimmerman's SRL theory (Mendoza Villacorta & Palacios Garay, 2023).

Conclusions

The present research allows confirming an underlying reality in the trumpet classroom: technology is no longer an external element introduced into the class, but an inevitable substrate that permeates teaching practice. Digitalization has become so integrated into everyday life that it has become almost invisible, from score management to instant communication with families. However, this integration reveals a dichotomy: on one hand, there is a clear awareness of pedagogical advantages—such as gamification, auditory stimulation, and accompaniment outside the classroom—; on the other, a justified resistance emerges against derived problems, including attentional dispersion, visual dependence, and digital saturation.

Such tension indicates that educators are agreeable to new ideas; however, they are anxious about losing their control. Teachers secretly desire tools that can combine these two aspects: provide them with the advantage of digital analysis, while also not distracting students or hindering teachers' academic freedom. Hence, the rise of AI can be seen as a new and uncharted horizon that enables the creation of support technologies, which, by increasing the teacher's monitoring ability, also take into account the individual characteristics of each class.

Therefore, the main conclusion of this study is not the need for a specific application, but the definition of a hybrid design framework based on a functional symbiosis. This approach

proposes preserving analog reflection (handwriting and physical support) for planning and metacognitive processes, protecting the student from digital distraction in moments of calm. Simultaneously, contextual digital analysis should intervene only to offer what paper cannot: an objective analysis of sound and time, always subordinated to the teacher's pedagogical criteria.

If we manage to design tools that are born from this consensus and that put technology at the service of pedagogy—and not the other way around—it is very likely that we will find broad receptivity in an educational community that, far from being immobile, is waiting for solutions that truly understand the nature of instrumental learning.

Acknowledgements

The authors acknowledge the use of Artificial Intelligence-based tools for translation assistance and grammatical correction. All concepts, findings, and the final version of the text have been critically reviewed and approved by the authors.

References

Albert Gargallo, J. (2017). *Dificultades de aprendizaje de la práctica motriz experta en la trompeta* [Tesis doctoral, Universitat Politècnica de València]. https://doi.org/10.4995/Thesis/10251/90538

Altenmüller, E., & Jabusch, H.-C. (2010). Focal dystonia in musicians: Phenomenology, pathophysiology and triggering factors: Focal dystonia in musicians. *European Journal of Neurology*, *17*, 31–36. https://doi.org/10.1111/j.1468-1331.2010.03048.x

Arban, J. B. (1864). *Grande méthode complète pour cornet à pistons et de saxhorn par Arban*. Carl Fischer.

Bandura, A. (1991). Social cognitive theory of self-regulation. *Organizational Behavior and Human Decision Processes*, *50*(2), 248–287. https://doi.org/10.1016/0749-5978(91)90022-L

Brown, R. W. (1928). A comparative study of the "whole," "part," and "combination" methods of learning piano music. *Journal of Experimental Psychology*, *11*(3), 235–247. https://doi.org/10.1037/h0071327

Clarke, H. L. (1912). *Technical Studies for the Cornet*. Carl Fischer.

Colin, C. (1980). *Trumpet Advanced Lip Flexibility*. Charles Colin Music.

dos Santos Silva, C., & Marinho, H. (2025). Self-regulated learning processes of advanced musicians: A PRISMA review. *Musicae Scientiae*, *29*(1), 89–108. https://doi.org/10.1177/10298649241275614

Ericsson, K. A. (1998). The Scientific Study of Expert Levels of Performance: General implications for optimal learning and creativity [1]. *High Ability Studies*, *9*(1), 75–100. https://doi.org/10.1080/1359813980090106

Ericsson, K. A., Krampe, R. T., & Tesch-Römer, C. (1993). The role of deliberate practice in the acquisition of expert performance. *Psychological Review*, *100*(3), 363–406. https://doi.org/10.1037/0033-295X.100.3.363

How, E. R., Tan, L., & Miksza, P. (2022). A PRISMA review of research on music practice. *Musicae Scientiae*, *26*(3), 675–697. https://doi.org/10.1177/10298649211005531

Johnson, G. B. (1962). Negative Practice on Band Instruments: An Exploratory Study. *Journal of Research in Music Education*, *10*(2), 100–104. https://doi.org/10.2307/3343993

McPherson, G. E., & Renwick, J. M. (2011). Self-regulation and mastery of musical skills. In *Handbook of self-regulation of learning and performance* (pp. 234–248). Routledge/Taylor & Francis Group.

Mehmood, W., Gondal, S., Faiz, M. S., & Khurshid, A. (2025). AI-Assisted Metacognitive Strategies for Improving Self-Regulated Learning among High School Students. *The Critical Review of Social Sciences Studies*, *3*(2), 2333–2349. https://doi.org/10.59075/vk7et188

Mendoza Villacorta, G., & Palacios Garay, J. P. (2023). Diario de aprendizaje y aprendizaje autorregulado en estudiantes universitarios: Revisión sistemática. *Revista Ecuatoriana de Psicología*, *6*(16), 205–218. https://doi.org/10.33996/repsi.v6i16.100

Moon, J. A. (2006). *Learning Journals: A Handbook for Reflective Practice and Professional Development*. Routledge. https://doi.org/10.4324/9780203969212

Pintrich, P. R. (2000). The Role of Goal Orientation in Self-Regulated Learning. In *Handbook of Self-Regulation* (pp. 451–502). Academic Press. https://doi.org/10.1016/B978-012109890-2/50043-3

Rubin-Rabson, G. (1940). Studies in the psychology of memorizing piano music: II. A comparison of massed and distributed practice. *Journal of Educational Psychology*, *31*(4), 270–284. https://doi.org/10.1037/h0061174

Schlossberg, M. (1965). *Daily drills and technical studies for trumpet*.

Schmitz, B., & Wiese, B. S. (2006). New perspectives for the evaluation of training sessions in self-regulated learning: Time-series analyses of diary data. *Contemporary Educational Psychology*, *31*(1), 64–96. https://doi.org/10.1016/j.cedpsych.2005.02.002

Webster, P. R. (2012). Computer-Based Technology and Music Teaching and Learning. In *Critical Essays in Music Education*. Routledge.

West, M. (2023). *An ed-tech tragedy? Educational technologies and school closures in the time of COVID-19*. UNESCO. https://doi.org/10.54675/LYGF2153

Zimmerman, B. J. (2002). Becoming a Self-Regulated Learner: An Overview. *Theory Into Practice*, *41*(2), 64–70. https://doi.org/10.1207/s15430421tip4102_2

Zimmerman, B. J., & Schunk, D. H. (2011). Self-Regulated Learning and Performance: An Introduction and an Overview. In *Handbook of Self-Regulation of Learning and Performance*. Routledge.