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# **Research, A Tool for Training Broad Minded Musical Students: Training by Research at the Princess Galyani Vadhana Institute of Music**

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## **Abstract**

The research process has played an essential role in the development of new styles and aesthetics throughout music history in the West. I demonstrate here that what we now call “classical music” evolved following the template that philosopher Thomas Kuhn describes for scientific research; namely that music evolves through a series of disruptions, from one paradigm to another. In recent years, many music professionals working in the domain of higher education have identified Artistic Research as a potentially fruitful avenue for development, and research-based learning is now being implemented in many conservatories at both the undergraduate and graduate levels. Following an overview of the historical importance of the research process within Western musical culture, I discuss the place of music research within higher music education today and specifically the roles that research has played in the development of the Princess Galyani Vadhana Institute of Music (PGVIM) since its foundation.

**Keywords:** conservatoires, research, training by research, higher musical education, music

The Princess Galyani Vadhana Institute of Music (PGVIM) is deeply committed to artistic research and social inclusion, two areas that are seen today as essential at many European higher music education institutions. Currently, for example, the Association of European Conservatoires is leading a project called

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“Empowering Artists as Makers in Society,” following on the heels of another project called “Strengthening Music in Society,” both funded by Creative Europe. In a graduation speech at Lyon University for the Administration of higher research institutions, I addressed the issue of “The place for research in a Bachelor degree” (Moreau 2014). I argued that research should not only be a method taught to doctoral students, but also a tool for training bachelor students; something that can empower them by helping them to develop their reflective skills. This goal was the basis on which the undergraduate curriculum of the Princess Galyani Vadhana Institute of Music was built.

To better explain the place of research in higher music education, I will first clarify the role that research played historically within the evolution of Western classical music. I will then provide a brief overview of the changes that occurred in music education as the broad ranging education which prevailed before the 19<sup>th</sup> century gave way to a more progressive specialisation after. Moving on from there, I will consider the important place that artistic research plays in higher music education today and underline the concept of learning by research. Finally, I will examine the role this concept plays within the education offered by the Princess Galyani Vadhana Institute of music (hereafter, “PGVIM”).

## **1/ Research in music throughout Western history**

Thomas Kuhn (1922-1996), a philosopher of science, sought to explain how scientific research works. In his book *The Structure of Scientific Revolutions* (Kuhn 1962), he argues that science evolves by disruption, through a series of paradigm shifts.

A paradigm is a coherent set of "laws, theories, applications and experimental devices" that provides "models that give rise to particular research traditions" (Kuhn 1962). A new paradigm rejects a previous one only when the new theories it poses are able to replace the old ones. Thus, a paradigm is necessarily part of a tradition, a lineage, whose epistemology will make it possible to analyse the factors that have influenced the views of scientists.

Once the new paradigm has set a new conceptual base, scientists develop new knowledge solidly based on this theoretical starting point to which they adhere, a process that Kuhn calls normal science: “The transition from a paradigm in crisis to a new one from which a new tradition of normal science can emerge is far from a cumulative process, one achieved by an articulation or extension of the old paradigm” (Kuhn 1962, 84). Through that process, scientists will then endeavour to put theory into practice, and thus utilize the conceptual advances of this paradigm. The aim of research based on this is not to create something new. As Kuhn argues, “the emergence of new theories is generally preceded by a period of pronounced professional insecurity” (Kuhn 1962, 67). The aim is rather to increase the scope and precision of the application of paradigms. In this work, the scientist needs to question what puzzle he or she is trying to solve. In doing so, such a scientist has to have “the conviction that, if only he is skillful enough, he will succeed in solving a puzzle that no one before has solved, or solved so well” (Kuhn 1962, 38). To do this, it will be necessary to determine a method, and even to design new machines and techniques to make it possible to achieve and demonstrate the predictions posed by the paradigm. During this research phase, there will be successes that confirm the paradigm, but also failures showing its limitations in both the theoretical and experimental field. Adjustments to the paradigm will be possible, but they will not call into question its correctness. This evolution of normal science will necessarily lead, at some point, to a failure, which will require the development of new theories whose importance will call into question the initial paradigm.

Through the history of Western “classical” music, we can find many examples of this kind of process.

### **How music composition evolved**

In medieval times, scholarly music principles were based on the Greek system that Boethius (470-524 AD) expressed in his treatise *De Institutione Musica* published at the beginning of the 6<sup>th</sup> century. This was the first established music treatise of our time in the West.

The scholarly tradition was essentially passed over through Roman liturgical chant. Those chants, practiced by monks in monasteries, were based on the ancient Greek modes. These morphed into the Gregorian sacred chants practiced all over Christian countries in the 8<sup>th</sup> century. From there, innovations gradually appeared, leading to one of the most important changes of paradigm at that time. Guido d'Arezzo (992-1050 AD), published the treatise *Micrologus de arte musica* in the beginning of 11<sup>th</sup> century, in which he developed innovative forms of notation and established the Latin system for naming musical notes (do, re, mi, fa, ...), which is still in use today. At the same time, the Plain chant practiced by the monks saw parallel melodic lines progressively added.

A change of paradigm appeared at the end of the 12<sup>th</sup> century, due principally to the "School of Notre Dame" in Paris. Polifonia appeared, bringing about different streams of development. The "Ars nova", established by a treatise attributed to Philippe de Vitry (1291-1361), opposed the "Ars antiqua" establishing the new paradigm of polifonia. "Ars nova" lasted until the death of Guillaume de Machaut (1300-1377), the most prominent composer of the period.

Through the Renaissance, polifonia evolved and reached a point where the modal system shifted into the tonal system. This was not a real rupture of the kind that Kuhn describes, but nonetheless the arrival of this new paradigm of tonality totally erased the previous style based on the modal system. That new musical system, that still exists today, was formalised by the 18<sup>th</sup> century by Jean-Philippe Rameau (1683-1764 AD). In the treatise he published, he established the harmonic principles of that new "paradigm", based on the two poles of the tonic and the dominant (1<sup>st</sup> and 5<sup>th</sup> note of the scale), and the complementary, or relative, minor and major modes. Those principles are still in operation today, in everything from the so-called "classical" styles to Blues, and many other musical styles as well.

Again, after the definitive establishment of tonality, a "normal science" explored all the possibilities of that new paradigm, from the end of the 18<sup>th</sup> century to the beginning of the 20<sup>th</sup> century. From Mozart to Richard Strauss, passing through Ravel and Debussy among many others, composers explored all the possibilities of this tonal system, experimenting with complex chords, modulating progressively to very distant tonalities and including new pathways within the system.

At the culminating point of this evolution, we reached a point where the sense of tonality, in the minds of some composers, lost its structuring role. Some reverted back to modality, yet put their own modern spin on its use. Gabriel Fauré, Claude Debussy and Maurice Ravel are good examples of this (see, for example, *Ma mère l'Oye*, dance suite initially composed by Maurice Ravel for a piano four hands duet in 1910). Some searched further, most notably Arnold Schoenberg (1874-1951 AD), who proposed a new paradigm with his “dodecaphonic” system which erased all hierarchy among the 12 notes of the chromatic scale. Immediately after, exploring this new principle, in a manner analogous to Kuhn’s description of “normal science”, Webern proposed an organisation of that “dodecaphonism” through “serialism”, a system that ruled the use of those 12 chromatic notes. After him, some composers like Pierre Boulez and Olivier Messiaen extended that notion of “series”.

The last main change of paradigm for music creation was caused by the arrival of electricity, a revolution that did not erase the previous systems of music production. Electricity made it possible to produce new sounds, new ways of composing with those sounds, first with tapes and then with computers. Pierre Schaeffer was one of the pioneering actors promoting this change of paradigm. In the 1950s, he created a music research laboratory for “concrete” music that initiated the contemporary stream of electronic music. That stream led to the creation of research institutions such as IRCAM in France.

### **An example of an instrument going through two changes of paradigm**

Laboratories such as IRCAM have played an important role in creating new instruments for performing and creating new music. Engineers and composers collaborated together to research the possibilities of what could be produced with new electronic means: new sounds, systems for computers, electronic instruments and ways of amplifying and processing the acoustic instruments.

This exchange between composers, performers and instrument makers has been ongoing throughout the entire history of music history. The need for composers to extend the range of the instruments at their disposal, or that of ensembles to extend the performance possibilities in relation to their performance spaces has challenged instrument makers to innovate in all eras.

clear example of this can be found within the history of keyboard instruments. The cembalo transitioned through various permutations into the piano and then, eventually, to the electronic keyboards of today.

Appearing in the West during the 14<sup>th</sup> century as a very small instrument, the cembalo progressively evolved to meet the demand of the increasing ensembles and its important place within high-class society. The length of its structure increased to provide a louder sound, its keyboard extended and a second manual was even added. It held a very important place in music until the middle of 18<sup>th</sup> century by which time the limitations of its expressive range, as a plucked string instrument, brought its popularity to an end.

Instrument makers researched ways to build an instrument able to play wider dynamics from piano (soft) to forte (loud). The hammer mechanism was invented by Bartolomeo Cristofori (1655-1731). That new way of producing sounds from the strings of a keyboard instrument took some time to be fully accepted and appreciated. But by the middle of the 18<sup>th</sup> century, it became the new paradigm. Since then, again, a “normal science” started to explore the possibilities of that new way of producing keyboard sounds.

An example of the link between the development of the pianoforte and the needs of a composer can be found in Ludwig van Beethoven. The composer adapted to the new possibilities offered by this new instrument in his sonatas, fully exploiting the extended lower and higher range of this larger keyboard as well as its wider dynamic range.

The piano became dominant during the 19<sup>th</sup> century, having totally eclipsed the cembalo. Some additional improvements—the dual exhaust for instance—allowed the development of keyboard virtuosity to levels never reached before. This development facilitated the emergence of the piano as a soloist instrument in the new industrial society.

The arrival of electricity introduced a new paradigm from which a “normal science” explored new possibilities but without erasing the former ones. This is quite different from what happened to the cembalo when the pianoforte appeared. This research based on electricity facilitated the creation of new instruments, new ways of producing sounds, and allowed for a considerable extension of the keyboard’s possibilities. The keyboard instruments – and not only them – benefited from this research, both in terms of the development of electronic instruments and in terms of development of “old” acoustic instruments as well. In recent years, musicians and instrument builders are researching possible extensions for those “old” instruments with systems that combine computer functionality with physical actions on traditional instruments.

### **An example of research driven by music performers: “historically informed” performance**

In the 1960s, several prominent musicians took a keen interest in re-examining the interpretative approach used for Baroque period repertoire. The most famous among this group were Gustav Leonhard and Nikolaus Harnoncourt. Through in-depth research, including the studying of treatises, instrumental methods and all historical documentation available, they searched for evidence of how music was performed during the Baroque era. They studied: the state of the instruments, how they were played, the use of the bows for string instruments, how music was articulated, the pitch at stake, etc. This research led to a reconsideration of the interpretive habits that had progressively been adopted through generations of performers playing on “modern” instruments. Within that process was the questioning of the “habits of the mind” that pointed out the French philosopher Henri Bergson and from which Gaston Bachelard, another French philosopher, explained that they were creating epistemological obstacles preventing new ideas from arising:

*It is then impossible to make a clean sweep of the common knowledge all at once. Faced with reality, what we think we know clearly offends what we should know. When it presents itself to scientific culture, the mind is never young. It is even very old, because it has the age of its prejudices (Bachelard, 1934, 17).*

The impetus has generated new practices among many performers: research on original scores, and deepening understandings of contemporaneous writings and treatises. This type of research is still ongoing, joining together inquiries from researchers and performers. This work is resulting in a totally new conception of the ways in which music composed in earlier periods should be performed. This is an excellent illustration of what can be today considered as “artistic research” for performers.

## **2/ The performer, once upon a time a complete musician**

Throughout history in the West the distinction between composers and performers was not as clear as it is now. In today’s Conservatoires, performance forms the largest part of education for most students, leaving composing to those few who are dedicated to its study exclusively. In the same way, classical performers generally leave improvising to the jazz students; rarely trying it out themselves. In previous eras, however, creating music was an essential part of the education of musicians.

During the medieval era, for example, monks improvised chants on a *cantus firmus*. During the Renaissance, musicians improvised by “diminishing” their parts (adding more notes within the melody) and until well into the 18<sup>th</sup> century, keyboard players were trained to use “*partimenti*”, a written notation base on which they realized improvisations.

The first conservatoires were created in Napoli at the beginning of the 16<sup>th</sup> century. Those first conservatoires provided a musical education to orphans who were taught as broad musicians, able to sing, play instruments, improvise, listen to, copy music and compose. Using the “*Partimento*” practice, the young musicians were taught how to improvise and compose: “These works [pedagogical works known as *partimenti*], which progressed from the very simple to the fiendishly difficult, were predominantly bass lines to which the student was expected to add upper voices or chords in order to create a complete keyboard work. (Gjerdigen 2021, 24); “(*partimenti*), skills that were themselves merely codifications of a living musical praxis” (ib.,34); “Long and assiduous training in *partimenti* and *solfeggi* could make many musicians accomplished, (ib.,452)”; “They constitute the clearest examples of

eighteenth-century instruction in large musical forms. Any student who studied and internalized a hundred or more partimenti of this scope would have little difficulty in fashioning an original work of similar size” (ib.,447). In fact, musicians were taught to use all possibilities of their time for creating and performing music.

During the 19<sup>th</sup> century, society shifted in response to new industrial practices., In music as in much else, specialized workers were needed to maximise efficiency. The Paris Conservatoire, created in 1795, became the model for the modern conservatoires. Highly professional performers were needed and were prepared to meet those demands through preparatory conservatoires that progressively spread all over the country. Students were recruited primarily on the basis of their performing skills. Composing was the privilege of a happy few. During the second half of the 20<sup>th</sup> century, in the “classical” music world, besides the emerging jazz and pop worlds, the standards for performers reached a climax. The average standards of the conservatoires alumni became incredibly high. Recordings, international competitions, and recruiting processes for orchestras set very high standards, requiring performers to dedicate themselves solely to the development of their performing skills.

Yet today, another shift is underway. Minds are gradually opening to the understanding of the broader needs of today’s musicians. The “historically informed” performance stream has encouraged performers to become researchers. Improvisation courses are now offered to students at an increasing number of institutions. The new need for stage performances has provided avenues for performers to explore and build performances integrating other arts or media into their work, and to new technologies for collective performance and creation. As an example, the Lyon Conservatoire has recently opened a course called “Artistic Diploma” focusing on researching and exploring ways to curate performances with new technologies. This course is an example of Artistic research in action.

### **3/ Artistic research in Music: An institutional shift supported by the Bologna process**

In Europe, in 1999, the ministers of education from 29 European countries signed an agreement for higher education called “the Bologna Declaration ”. Since then, 48 countries have signed that declaration, including Russia, Ukraine,

Armenia, Azerbaïdjan and Kazakhstan. That declaration initiated a process that created the European Space for Higher Education, with all countries adopting the same educational structure in three levels (Bachelor or undergraduate, Master and Doctorate) to facilitate student exchanges and institutional cooperations.

Within that process, the place of Artistic Research has become increasingly important. Artistic Research was defined and the group specified what is proper to that research besides academic research (Henk Borgdorff, 2012). The Association of European Conservatoires (AEC) played an active role in this process, creating the European Platform for Artistic Research (EPARM) and contributing to the recent Vienna Declaration on Artistic Research.

Already the main subject for the Doctorate level, Artistic Research has progressively gained a footing at the Master level, where, for an increasing number of musical higher education institutions, students are required to develop projects implementing a research project on their art. The Royal Conservatoire The Hague is one of the most impressive examples of what can be done and what students are able to achieve whilst still training for the highest level of performance.

While becoming well established, this shift in the training of researching musicians – performance students training both for their skills in their art at the highest possible level and acquiring research competences – needs teachers that are ready to broaden their own minds, as this new approach is generally something they were not taught themselves as students. This issue is now a challenge at many institutions.

Furthermore, in order to enable master students to achieve research objectives in a well-balanced manner alongside their performance development requires addressing the development of research competences as early as the undergraduate level. For that and for the purpose of developing broadminded students and musicians, the concept of “training by/through research” provides a very helpful tool.

#### **4/ Training by/through research**

The model of training by/through research, also called “inquiry-based learning,” focuses on the process of knowledge construction. Research is not seen as necessarily producing new concepts, but as enabling the discovery of new knowledge for the student.

“Enquiry-Based Learning inspires students to learn for themselves, bringing a real research-orientated approach to the subject” says Dr Bill Hutchings, professor at Manchester University, which developed a Center for Excellence in Enquiry-Based Learning.

This concept of training provides an environment in which learning takes place through a process of inquiry that is dependent on the student. The student must identify his or her problems, define his or her own questions, and examine the resources he or she needs for conducting research and investigating the chosen topic. Through this process, the student acquires the necessary knowledge from experience and in relation to a problem that is part of his or her reality. This training may therefore concern a simple survey or projects of various sizes, up to a research project. This educational model implements the principles of inquiry theorised by John Dewey, the American philosopher.

This training includes what is called “Problem-Based Learning (PBL)”, which is particularly developed in medical schools. Diana F. Wood explains that in this type of training, students start from the problem to define their own learning objectives. The objective is not, therefore, to solve the problem posed, but to use the problem to acquire knowledge and skills.

When the same problem is given to all students in a PBL framework within the medical field, it is up to the student to identify the problem from which he or she will develop research questions. This requires some form of preliminary investigation to identify what is problematic. And this is even more important in art schools, also for music higher education.

This approach relates both to the concept of reflective practitioner developed by Donald Schön (Schön, 1984) and the concept of inquiry developed by John Dewey (Dewey, 1938). In this approach, the student is the owner of his or her learning. This is an ideal educational method for students in the arts where the learning approach is very personal.

Through this process, the student is led to look at the world, be it the musical world or the global world, with a new perspective. Through this process, the student is able to initiate new actions addressed to the world. The French author Jean Marie Barbier believes that, in general, “*all actions of transformation of the world are also activities of self-transformation transforming the world*” (Barbier, 2008). The transformation that research allows therefore begins with that of the individual him or herself. This is what this author confirms:

*Research actions presuppose on the part of the subjects who conduct them a transformation of their mental frameworks, a transformation likely to be invested in the interpretation activities that accompany their actions of transformation of the world (Barbier, 2008).*

Self-transformation exactly corresponds both to the concept of the German Bildung, from which Wilhelm von Humboldt created the Berlin University in the beginning of 19<sup>th</sup> century, and to the concept of self creation developed by the French philosopher Henri Bergson, for whom the artist is the one who looks at the world differently.

Both self-transformation and actions on the world are principles at stake within the Princess Galyani Vadhana Institute of Music.

## **5/ As an example of research-based learning: the PGVIM**

Together with social engagement, research was set as a one of the founding pillars of the Princess Galyani Vadhana Institute of Music from the start, both at the institutional level and for the students at the education level as well.

An annual summer symposium was initiated from the very beginning in order to explore the relation between music from the West and music from the East, and more specifically the music of Southeast Asia. The underlying questions were: if the institution trains students in Western classical music, what does it mean? What is expected?

That concern for research also echoed the ongoing reflection in Europe on the development of artistic research and the doctoral programs within the Bologna process, an example of which is the creation of the Orpheus Institute in Ghent, dedicated to doctoral artistic research.

Artistic research in music covers many areas: moving forward, creating new music; historically informed performance, combining musical practice with research in music history and performance practice; and also, research on stage performance, discovering interdisciplinary links within the arts and through the exploration of new technologies.

Many aspects of music dissemination benefit from those research projects: the renewal of performance practices, the outreach to wider audiences, as well as the development of new possibilities for modes of social engagement. All of these aspects are important to the PGVIM philosophy.

At the educational level, PGVIM implements in its curriculum a research-based learning or “training by research” philosophy. Through inquiry-based projects, students apply a research methodology that brings them to experience new fields and new concepts. Through this process, they build upon their knowledge and improve their skills, developing autonomous learning as they become reflexive practitioners and owners of their learning.

Within the undergraduate curriculum, the “Recital project” constitutes a strong path of artistic research-based learning through inquiries, creation of projects and reflective practices. Within that stream inside the curriculum, students are able to reflect on what they learn and perform, and are able to create and improvise. This “Recital project” culminates in the third and fourth year, when the students present

the outcome of their process as part of their junior and graduation recitals. All through this process, students benefit from strong support from faculty mentors.

These projects are not conceived as exercises for applying concepts learned in class, but as opportunities for involving the students in experiences that allow them to build fundamental knowledge and skills; inquiring on subjects they are personally interested in, related to their musical interests. Benefiting from the full support of the teachers responsible for this stream at the core of the curriculum, the students are able to follow adapted research methodologies: each step of the project or the inquiry is built and carried out in stages, each of which is presented, discussed, and evaluated in turn. Thanks to these projects, students are able to build links with technology—musical technology, and visual arts technology—and to create musical productions, sometimes mixing electronic music with traditional performance.

Through that process at the core of the education delivered by the institution, students are trained in a manner somewhat similar to those who studied in the first Napolitan conservatoires: using all means of inquiry available at the time to create and perform music. This kind of approach prepares students for the future of music performance in a world where societal needs are in flux and must be faced by musicians. For that, they need high standards of performance skills, creative skills, the ability to reflect on their actions, and the ability to respond to societal demands.

## **Conclusion**

Within the AEC, there is now an ongoing discussion regarding innovative learning and teaching practices. This discussion is even more relevant today when artistic research holds such a strong position within so many institutions.

An artist is naturally a searcher. But in Western classical music performance, the last decades have produced specialised performers more trained to highly reproduce notated scores than to be creative artists. In this context, training by research is a shift of paradigm, not meant to train researchers but to lead students to recover or extend their natural childhood curiosity, explore new and unknown fields, master a methodology that allows them to support their ideas, and build new and diverse

ways of disseminating music in a highly changing global world. Training by research means empowering students to take control of their learning process, giving them power to take control of both their future and the future of their art.

Artistic research and societal outreach, along with the development of high performance standards, are currently the main concern of most music Conservatoires. The Association of European Conservatoires, after having responded to the need for artistic research by creating a dedicated platform for its development, is now addressing the issue of societal engagement. Among the institutions that are taking up these challenges, the Princess Galyani Institute of Music offers an example of how it is possible to engage students in performance, inquiries, and aspects of social engagement all at the same time, and for each of these educational goals to support and reinforce each other.

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### Links:

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