

# **Education on Music and Technology, A Programme for a Professional Education.**

Hans Timmermans, Jan IJzermans, Rens Machielse, Gerard van Wolferen.  
Utrecht School of Music and Technology, Utrecht School of the Arts.  
The Netherlands.

e-mail: [hans.timmermans@kmt.hku.nl](mailto:hans.timmermans@kmt.hku.nl),

## **Abstract:**

Designing a programme of study for a professional education on Music and Technology is no simple task. The field of studies is in constant and rapid development and because of that the characteristics of 'the professional' in the field of work are changing very fast. The School educates 60 students a year up to the level on which they can work, survive and keep up with the developments. 95 % of them develop a healthy career after graduation. The programme covers most of the field in various degrees and educate students up to MA and MPhil levels. The programme was developed over the last 17 years and is updated on a yearly basis. We have build in mechanisms to enforce regular updates of the programme and to develop the knowledge and skills of the teaching staff. This paper describes the programme, its design criteria and the updating procedures along with the vision on education on Music and Technology.

## **1. Introduction.**

Utrecht School of Music and Technology is a Dutch Professional Education on the broad field of Music and Technology. Our School is part of the Utrecht School of the Arts, a University with 5 faculties (Visual Arts, Music, Theatre & Drama, Interdisciplinary Studies and our faculty of Art, Media & Technology), around 3000 students and 600 lecturers.

Within the School of Music and Technology we offer several degrees such as:

Sound Design.  
Composition for the Media.  
Composition of Electronic Music.  
Composition & Music Production.  
Composition & Music Technology.  
Music Production & Performance.  
Music Technology & Performance.  
Audio Design.

Some of these programmes have a strong emphasis on Arts; some are more Technical.

The programmes partially overlap. Currently the School has over 300 students and around 30 lecturers, we offer BA, MA and MPhil studies.

The mission of the School is to educate young students up to a level of skills and knowledge and to a level of professional attitude good enough to work and survive in this field within the Dutch context and in the international context. The emphasis of the different programmes is on the personal development of the student; to help her to earn a living and to establish a professional career in which she is able to continue the professional development and keep up with the constant and rapid development of the field of Music and Technology.

Around 95 % of our graduates develop a healthy professional career within 2 years after graduation (MA).

## **2. Some history and the birth of a vision.**

Our School started as a department of Utrecht Conservatory of Music in 1985. Our aim in those days was to stimulate development of knowledge and skills in Music technology for Professional Musicians, music students and amateurs. The other aim was to develop a professional education on Music and Technology.

The initial staff started with the ideas that were quite common in 1985, an emphasis on composition and research based on software development. This programme started in 1987. Within a couple of years the programme had to be restructured because of a misfit between our aims and the real opportunities for professional careers that existed in the Netherlands and careers that were developing while Music technology

developed into its current role as a major production tool for music in general.

After this restructuring we have been updating with the outside world on a very regular basis to obtain a good (not to say perfect) match between the educational programme and the demands of real existing professional careers. For the last 6 years we get figures like the 95% of our graduates that have a healthy career within Music technology within two years after their (MA) graduation.

Pro year the School of Music and Technology educates around 60 students of which 17 are composers.

In the Netherlands around 500 educated composers on a population of 16 Million try to earn a living. For a career as a composer of Art Music there are simply too many composers around in the Netherlands.

With a classical structure of a Music Education and the content that goes with such a classical vision most of our graduates would be out of a professional career within months. We started focused on Art and Research in the early years of our School and we learned a lot from it. From this experience we developed among other things our MA Composition in Contexts, which was validated by the UK Open University in 2001.

### **3. Vision and mission.**

Music and Technology is a field of studies in constant and rapid development.

The most important thing to teach a student is how to keep up with this constant development. So we teach our students how to study and how to develop as a professional after graduation. To establish this attitude and to develop the skills to do so the teaching staff developed some formats for parts of the programme:

- Lectures and classes, as they have been there for ages.
- Workshops in which a student learns from exercises accompany the lectures.
- Learning-projects in which the focus is on some aspects of Music technology.
- Hands on sessions and practical assistance of older students.
- Study-groups in which students work together on theoretical issues.
- Study-groups in which students discuss each other's work in progress.

- Industrial placement in companies or research Institutions.
- Real world projects with assigners from outside the School.
- Interdisciplinary projects with a strong emphasis on the production processes that are typical for the multidisciplinary setting of the specific project. (Some examples: Music Composition & Contemporary Dance, Interactive Composition & Theatre, Sound Design & Games)
- Research projects, most of these are parts of research projects of staff members.
- In the MA-programmes students work on group projects; on individual projects and on a thesis.
- In the Advanced Studies programme students do their own research or compose and produce their own work (resulting in a Port Folio for the Final Exam).
- In the MPhil programme students do their own research (sometimes within large scale research projects of the School) and write a thesis about it.

The overall characteristics of our programme:

- Students learn by doing,
- Students learn to be their own teacher.
- We educate the student to professional independence with self-reflection as an important tool to keep up with new developments, to gain new insights and develop new concepts.

### **4. The Programme.**

The programme is designed for an education of 4 years (Dutch BA in 4 years, MA 4 years +) followed for the talented students by a 'second phase' programme, which could parallel an MPhil-study. The education may start with a year preparatory studies, which is an extended remedial teaching course with introductions to core subjects.

We offer 8 BA-studies:

Bachelor of Art and Technology (BAT):

- BAT Audio Design.
- BAT Sound Design

Bachelor of Music (BMus):

Within the profile Composition:

- BMus Composition for the Media.
- BMus Composition of Electronic Music.
- BMus Composition and Music production.

Within the profile Music technology:

- BMus Composition & Music technology.
- BMus Music production & Performance.
- BMus Music technology & Performance.

We offer 4 MA's:

European Media Master of Arts:

- MA Gaming.
- MA Sound & Music production.
- MA Sound & Music technology

Composition:

- MA Composition in Contexts.

#### **4.1. The Programme, from teacher to consultant, from student to young professional.**

Semester –2: preparatory courses, remedial teaching, exercises and hands-on sessions.

Semester –1: preparatory courses, remedial teaching, exercises and hands-on sessions.

Examples from the professional practice.

While in the first year the teacher is the one to decide about subjects, projects, research, his role is evolving from teacher to consultant during the education of the student.

Semester 1: education, the initiative is with the teacher: classes, theory, exercises, small assignments, and small projects.

Semester 2: education, the initiative is with the teacher: classes, theory, exercises, small assignments, and projects.

Semester 3: education and confrontation, the initiative is mostly with the teacher: Some theory, exercises, assignments, simulated real world projects.

Semester 4: confrontation, the initiative is to some extent with the student:

Semester 5:

Semester 6:

Exam:

Semester 7:

Semester 8:

Exam:

Semester 9:

Educational projects, simulated real world projects.

Theory related to the projects. confrontation, the initiative is mostly with the student:

Educational projects, simulated real world projects.

Theory related to the projects.

confrontation and the real world, the student works independently,

The teacher acts as a consultant.

Industrial placement or internship, research and small thesis.

MA admittance.

real world, the teacher is a consultant, apart from the theoretical seminars:

Projects for real-world assignment givers, cooperation in multi-disciplinary teams, participation in large scale projects with external partners. Theoretical seminars, subjects chosen by the teachers.

Theory related to the project, some of the subjects chosen by the students.

real world and individual development,

The teacher is a consultant, apart from the theoretical seminars:

Projects for real-world assignment givers, cooperation in multi-disciplinary teams, participation in large scale projects with external partners.

Individual research of students, individual projects.

Theoretical seminars, subjects chosen by the teachers.

Theory related to the project, some of the subjects chosen by the students.

BMus, the teacher is part of the exam committee.

(6 weeks) Thesis and final exam, the teacher is consultant and evaluates.

Projects, research and thesis are evaluated.

Portfolio is presented by the student in the form of an application for a job.

Exam: MA or BAT, the teacher is part of the exam committee.

Advanced Studies (2<sup>nd</sup> phase studies; could parallel an MPhil):

Semester 9: Theoretical Seminars, presentations of own research, Personal Development Plan. (PDP) and Planning the Thesis.

Exam; Semester 10; PDP and Thesis-planning Research, (multi-disciplinary) projects, compositions, performances, concerts.

Semester 11; Research, (multi-disciplinary) projects, compositions, performances, concerts.

Semester 12: Thesis, final concert, projects, portfolio.

Exam: MPhil, Dutch exam 'Advanced Studies' (2<sup>nd</sup> Phase).

In the Advanced Studies teachers act as consultants or as (senior) researchers.

Each student has a supervisor closely connected to his research or compositional work.

Theoretical seminars are taught by lecturers and guest-lecturers.

#### **4.2. The Programme: Subjects, classes and projects and some other details.**

Months 1 to 18:

Basics in sound, music, production and technology (classes and exercises)

- Ear-training for sound. (Sound solfège)
- Synthesis technology
- Sampling
- Development of music- and synthesis software (in MAX and/or C++)
- DSP (digital signal processing) (theory, exercises in CSound or SuperCollider).
- Music production technology
- Music theory
- Composition, arranging & instrumentation
- Methods for analysis & synthesis
- Ethnomusicology
- (Psycho) acoustics
- Contexts and repertoires
- Research & Development
- Professional skills like presentation, communication etc.

Month 19 to 30:

Blocks of 8 weeks (project, theory related to the project, study group – eight weeks). Projects evolve from mono- to multidisciplinary.

Month 31 - 36: internship and writing a (magazine) article on a subject in the field of interest of the student. Articles have to be of interest for first year students.

Month 37 to 48 (or 54):

BMus or BAT or (by means of 6 weeks extra)

MA (S&MP, S&MT, CiC).

BMus, BAT and MA:

- Projects with an external assignment (working with choreographers, directors, actors, writers, musicians, producers etc. – we collaborate with a lot of people and institutions outside our faculty).
- Theory related to projects and study groups
- Theoretical seminars on subjects (not specially related to projects)

MA: Thesis.

## **5. Updating and keeping up with the developments.**

The common profile of the teacher at our School is a professional with a career outside the School and a part-time job at our School. The private career of the teachers ensures that the actual practice of the profession is a common background of the teaching staff. Some members of the staff have fulltime jobs, they are heavily involved in projects with external partners like companies, individual artists, studio's etc. These external projects may be R&D-projects but most of the projects are related to production for the Music Industry or related to Art productions for the Stage, Dance, Theatre, Concerts). Regular projects are collaborations with other educations, with Theatre and Dance Companies and with Cultural Institutions. Teachers involved in this projects use this projects to keep up with current developments. Apart from this strategy the School has a training and study programme for our teaching staff. Guest-lecturers teach part of the programme; some of these guest-lecturers are invited to the School on a regular basis (a couple of times a year). Guest-lecturers are asked to comment on the programme. Apart from this all the faculty did organise an Advisory Board, which evaluates the programme and its outcome and reports on strong and weak points. Our MA-

programmes are evaluated on a regular basis by an independent authority such as the UK Open University and other Universities in our network. In all of our exams an external committee-member participates and comments on the findings.

## **6. Attitude towards students, formats and way of working.**

### **6.1. Analysis and synthesis.**

We try to teach students a method for analysing music, sound, style or (design and production) processes and how to extrapolate and transform this into their own music, sound, style or production process.

### **6.2. Project-orientation.**

In real world most of the work is done in mono- or multi-disciplinary projects. In a project all kinds of compositional, technological, productional and professional items will show up. In the first years of the programme we work with so called "learning-projects" which are formulated by the lecturers themselves which gives us the opportunity to closely follow the educational process. Later on in the curriculum the projects are getting more complex, multidisciplinary and in the end students are working on external assignments.

#### **6.2.1. A project is always accompanied by theory related to the project and a study group.**

Theory: classes on the theoretical aspects of a project.

Study group: presentation of work-in-progress to each the fellow students and to the lecturer.

Students also do research on certain aspects of the project. If they are working on a dance movie...they might do research on a certain composer of modern dance music or on the use of form in music for modern dance.

### **6.3. Co-operation on a student- and lecturers level.**

Lecturers are working in teams on lectures and projects. So lecturers know from each other what is going on in the classes, projects and lecturers. All of our lecturers communicate a lot and that's

why we developed a rather well defined musical and educational philosophy.

On a student level there's a lot of co-operation in the projects, even with other disciplines. Students from MA and 2nd Phase also give lessons on particular subjects in the 1st and 2nd year programmes.

#### **6.4. The importance of integration.**

Students work in groups with different disciplines. That's how the students learn a lot about those disciplines, which enables them to communicate with the other disciplines. They can actually say to a programmer: "Hey..... I'm working on a film and I want to use these kind of sounds....can you make a MAX/MSP patch for me which can generate these specific sounds?" (Cause he knows that the sounds he wants can only be generated by MAX/MSP)....

### **7. Composition in Contexts, a vision on Education on Composition.**

In the past century we have seen a rise in the number of contexts for composition. Composition for stage was followed by composition for dance, film, animation, documentary, drama, commercials, private use of music systems, and installations. Since the rise of new media there has been an increase in the need for composition for contexts like games and other contexts created by or for non-linear, interactive and/or distributed systems.

*With the word 'context' we refer to a specific practice in which the following aspects interact: form/context of presentation, methods of conceptualisation, methods of design and methods of production, other composers, repertoires, theories, reflection and evaluation, audience/users and their expectations, medium/platform and cultural setting and commercial aspects.*

Traditional higher education on the field of composition targets especially at the stage context and only rarely at other contexts. Therefore higher education and research are needed in the field of composition and relations between composition and the various contexts that deal with all the various contexts, since they influence and need each other. Furthermore, traditional contexts are mostly mono-disciplinary while most new

contexts ask for a more multidisciplinary, cross-media and cross-format approach.

The curriculum is designed to reflect and quickly respond to the changes in the field of music and media industries to deliver state of the art professionals in these rapidly evolving fields of work while maintaining the highest standard of academic integrity.

The course aims to cater for graduates of composition courses currently delivered across Europe. Hardly any of these courses offers a programme dealing with other contexts of composition than the stage, and occasionally film. The past decade has seen a large increase in work for composers who can deal with other than the traditional contexts. Many of the graduates may choose for a postgraduate course that covers more and newer contexts. Other candidates will be graduates from sound design, music production and music technology courses. In these courses composition can be less important or, when important, again often only a few contexts are covered.

The opportunities of advanced study and applied research enable all students to investigate in a critical environment the transformations and ambitions of both academia and industry, whilst enabling practical and creative experiences which may directly influence or contribute to the developments of these sectors.

The MA CIC course is based on 15 years of experience in composition, music production and music technology education. All these years the school has worked with professional teachers who work in the field. During the last five years the school has postgraduate courses in music production and music technology.

Working within a multidisciplinary environment is of particular concern to the MA CIC course. Multidisciplinary working and networking are key skills required within the music and media fields. Building and maintaining a Postgraduate community within the course is prioritised, enabling these skills to be developed and the music and media fields to be better understood.

#### **7.1. Aims of Programme of Study,**

1. To create educational opportunities for graduates to further develop an own compositional style and way of working,

- in accordance with the position of composition in a multidisciplinary, cross-media and cross-format setting.
2. To develop a solid research-based foundation for creative practice, while developing critical perspective through reflection.
  3. To cultivate the technical and transferable skills required for professional success and develop an attitude of continuous learning to keep pace with the rapidly changing environments the students will face in their practise.
  4. To challenge individuals in a supportive learning environment to realise their potential as reflective practitioners, both as individuals and as members of multidisciplinary teams, closely reflecting the design and production processes in the music and media industries. To create awareness for effective organisation forms and ways of working.
  5. To foster understanding of art, media and technology in the contexts of they're making and use through an integrated approach.
  6. To enrich the learning environment by building partnerships with complementary organisations and to develop and maintain close relationships with the industry.

## **8. Practical issues.**

With a population of over 300 students with all of the projects they are involved in there is massive need for equipment, studio's, software, workspace etc.

We solved this problem to some extend by the following strategies:

The School is open for 24 hours a day, 7 days a week, 50 weeks a year. For junior students (first and second year) restrictions exist on the kind of studio's and equipment they can make reservations for. After they have done the proper exams they will get a sort of drivers-license, which allows them to make reservations for the full-scale studios and the expensive equipment. For all studios and equipment we have very strict rules on maintenance, caretaking and proven necessity for reservation, allowed amount of time

span. Teachers inform the assistants on projects and students involved.

### **8.1. Penalties.**

The sentence for severe misbehaviour can run to a prohibition for a time of 3 months to work in the studio concerned. In examination time that is a calamity for the student. In the exceptional case that this heavy means is used it thus is extremely instructive for the students and works very preventive.

### **8.2. Other measures.**

Students are in their last year very dependent on the facilities such as studios and sophisticated equipment. These students get themselves the facilities)(like a recording studio) in management (in association with the teacher concerned) and exercise legal social pressure on fellow students which tend to misbehave. The system works very well and saves us a lot of work and energy.

### **8.3. Project and teams:**

MA students working on projects may be allowed to manage the equipment and setups that are necessary to do their research. They are also very dependent on the well functioning of their facilities so they will take care of the equipment in an equal careful way.

### **8.4. Technical assistant.**

The management of the total facilities of the School is a rather complex task. We hired one of our very good graduates to do so. He knows the School, the programme, the teachers, the students and the problems to expect. In his job he developed himself to an indispensable factor in the management of the School.

### **8.5. Teachers:**

As the field of Music Technology is expanding and developing we are in constant need for experienced and well-educated teachers. Our School is expected to grow for another couple of years. Regularly some of the most brilliant graduates are invited to apply on a part-time job as a docent after being working for a number of years as a professional in practice. These young teachers initiate new developments in the programme and in the daily routine of the School.

## 9. Some examples of multi-disciplinary projects:

### 9.1. Project Management of Multidisciplinary Art Projects.

In multi-disciplinary projects we pay a lot of attention to the project management and the production processes involved. We try to get all the participants on the following schedule:

- Orientation and research.
- Concept.
- Design.
- Briefing, Appointments, Commitment, Planning.
- Disagreements, Arguments and Fights.
- Research, Development, Production.
- Post-production.
- Presentation and Publication.
- Reflection.
- Evaluation.

In the projects that followed different schedules we found a loss in efficiency and a gain in frustration of the participants. Especially the phases *Briefing, Appointments, Commitment, Planning* followed by *Disagreements, Arguments and Fights* appear to be extremely important for the success of the total project.

Some time ago we did “**Synergy**”, a project with choreographers, dancers, visual artists, software developers, composers and theatre technicians:

‘**Synergy**’ a Multidisciplinary Art Project, R&D on Interactivity in theatre-performance.

- Collaboration of 6 disciplines:
  - Dance Company Krisztina de Châtel, Amsterdam.
    - Choreography.
    - Dance.
    - Production.
  - V2\_lab, Rotterdam.
    - Visual Arts.
    - Software-development.
  - Utrecht School of Music and Technology.
    - Music Composition.
    - Software-development.
    - Production.

The time schedule was:

- 2 months Laboratory, Feb. March 2001.
- Presentations of 'work in progress'.
- Aachen (3) March/April 2001.
- Rotterdam (2) 17 & 18 April 2001
- Amsterdam(2). 24,25,26 April 2001
- Continuation into series of performances.
- Decisions to make.
- Funds to raise..

This project was a real world project in which students of our 2<sup>nd</sup> phase programme worked with partners from other disciplines and other institutions. In this project students learned from hard practice much more than we could ever teach them in a normal school situation.

Another example is a project we do each year in the MA-CiC and 2<sup>nd</sup> Phase:

#### **"A Blind Date?" (Edition 2003).**

A project of: Rotterdamse Dansacademie and Utrecht School of Music and Technology.

An excerpt of the information handed out to teaching staff and students:

"A Blind Date?" is a meeting between choreographers and composers from the Rotterdamse Dansacademie and the Utrecht School of Music and Technology in cooperation with SpringDance (Utrecht).

"A Blind Date?" is a workshop where choreographers and composers, working together as a couple, will investigate a common concept which has to be clear before the workshop starts. During the workshop there will be the possibility to do research on aspects like production methods for contemporary dance & music, the role of communication in these methods etc. For clearness' sake: these are only a few examples to investigate.

The participants themselves will probably raise a lot more interesting and different questions...

The workshop consists of an introductory meeting followed by ten full days of working together and later on some days as a participant of the SpringDance-festival (a meeting between

choreographers and composers on a professional level organised by SpringDance). During the period of ten days of working together there will be a number of presentations for a feedback-team consisting of several guest lecturers. This feedback-team will comment on the process, interaction, content etc.

The project will end with a presentation of the outcome of the ten days work (whatever that is). The audience of that presentation are the lecturers and guests like Marcel Wierckx, Dylan Newcomb, Felipe Perez Santiago, Hilke Diemer, Hans Timmermans and students from both institutes which are involved in making choreographies and/or music for dance. The rest of the audience will be from the network of 'De Lantaren/Venster', the theatre where the final presentation will take place. The presentation of Blind Date is part of the festival 'Jonge Dans' ('Young Dance'), a meeting of Dance Educations from Turkey (Istanbul), France (Cannes) and the Netherlands (Rotterdam).

## **10. Conclusion:**

The period 1985 up to present we have succeeded in the development of a continuously modifying educational programme. This programme prepares students very well to the existing professional practice. Both the programme and (the knowledge and skills of) the teaching staff are adapted ongoing to the developments in the field. Developing and ongoing update of such an educational programme is not simple. The organization and the attitude regarding education and students should not prevent such a ongoing development but promote it. For this reason it is necessary to build in mechanisms to guarantee that development, the quality standards and to monitor the field of studies.

More info can be found at:

<http://www.hku.nl/usadb/fac/fac-en/kmt/kmt-course/mus-tech-comp-elekt.html>

<http://www.hku.nl/usadb/fac/fac-en/kmt/kmt-course/mus-tech-comp-media.html>

[http://www.hku.nl/index\\_en.html](http://www.hku.nl/index_en.html)