USING NEW MEDIA TECHNOLOGIES IN DANCE IMPROVISATION CLASSES

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INTRODUCTION

Every creation system has its technologies, which consist of methods, techniques and tools. The same holds true for Dance Improvisation. When choreographer William Forsythe presented his CD-Rom "Improvisation Technologies" to the public in 1997, a shift in paradigms became apparent: instead of focusing on the material aspects of technology (hardware and software), he emphasised the conceptual plane.

The use of the term "technology" in combination with "improvisation" may sound provocative for those who see the arts and science as opposite and incompatible areas of human endeavour. But for others this combination expresses an interesting conceptual and collaborative approach to creation.

In my own work as a choreographer and as a teacher, New Media technologies offer powerful and stimulating tools for rehearsal, creation and performance processes. Beyond the utilitarian value of these technologies I have been very inspired by the conceptual work that led to their development. In this article I will reflect upon technologies for Dance Improvisation, and present the Dance Lab as a format to experiment both with the material and conceptual aspects of technologies.

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1. Dance Improvisation

Dance Improvisation is a term encompassing a variety of very different systems and techniques with a wide range of objectives. Improvisation is used as a tool in almost any dance form existing today, from (neoclassic) ballet to hybrid forms of modern and postmodern dance, contact improvisation, dance theatre and physical theatre to concept dance.[1] Dance Improvisation can be used in the training of the dancer, in the creative process of making a new piece, or even as

integral part of a life performance.

Therefore the objectives of improvisation in dance are manifold: to explore new ways of moving, to create movement material, or to explore variations of existing parts of a dance work. We must distinguish between objectives related to the production and performance of a new dance work, and to other, less product-oriented goals. The latter includes identifying idiosyncratic patterns and habits, breaking them and moving in different, surprising ways.

In correspondence to these different possibilities we find a wide range of improvisational techniques and systems, which address the needs of dancers, choreographers and teachers. One important area of Dance Improvisation is comprised of the "awareness techniques", which in general aim to develop a deeper understanding of who we are, how we move and respond to our environment and other people. Contact Improvisation, Body-Mind-Centering, the Feldenkrais method, the Alexander technique, or the work with blindfolds, are a few well-known examples.

A very different form of improvisation in dance aims at the exploration of compositional and/or movement principles, usually towards the making of movement material for the creation of a dance work. William Forsyth's Improvisation Technologies and Trisha Brown's early work are good examples for this kind of improvisational processes.

Almost every contemporary choreographer today uses Dance Improvisation as an integral part of the creative process. In the form of (artistic) research questions, they explore the cultural background, life experience and forms of training of the dancers involved in a new production.

Last but not least it is important to mention improvisation in life performance, which employs carefully designed strategies and pre-defined structures to allow a dancer to re-create the work each time it is performed with varying degrees of freedom.

As aforementioned, there are many techniques and systems, which can be used for specific purposes and in different areas of the dancers' daily work, and stages of the creative process. In my experience it has been very rewarding to research into the area of how to resource inspiration, how to provide stimuli and design improvisations, because this has enabled me to work with all kinds of dancers, actors and artists from other fields, as well as interested non-professionals.

Sources of inspiration can be shared across all forms of dance improvisation. The process of communicating an improvisational task to the dancer is crucial for "translation" by him/her, meaning that this instruction or information needs to be integrated in the particular system, or form of dance. In other words, creative strategies for improvisation can work in different dance techniques, styles and systems, if they are carefully adapted and transmitted clearly. Over the years I have developed a system of five categories of resources for improvisation.[2]

These five categories consist of:

1. <u>Physical form/sensorial system</u>. Exploration of our individual physical characteristics and possibilities fall into this category.

2. <u>Perception</u>. All kind of external information that we receive through our sense organs serves as stimuli for

improvisation in this category. For example music, visuals, or a specific site often can provide the desired kind of stimuli.

3. <u>Conception</u>. The third category focuses on exploring the creation and use of mental images and concepts based on what has been perceived.

4. <u>Volition</u>. That what motivates action; the will to act on the conception is the central aspect of experimentation in this category. In other words, which mental images and concepts can trigger movement responses, and which don't?

5. <u>Consciousness</u>. In this category the improviser works on being conscious of the improvisational process itself and makes informed choices and decisions.

Naturally all five categories interrelate in the process of improvising. But I found this categorization very helpful in order to design specific creative strategies for improvisation. Each category builds on the previous, and improvisational training can be systematically developed on the base of this model.

2. New Media Technologies
The majority of students, teachers, dancers, and choreographers are familiar with technologies supporting classes, rehearsal and performance, as far as hardware is concerned. Today digital photo and video cameras, audio equipment for recording and playback, theatre lighting, even mixing tables for sound and lights don't scare anyone anymore. When it comes to using the computer, word processing programs, e-mail applications and Internet browsers are familiar to almost everyone. Younger users have at one point or other been exposed to simple editing of images, videos, and sound files. Many are creating their own web sites, blogs, You-Tube videos or pod-casts with ease.

In dance like in many other areas of life we have witnessed a rapid increase of possibilities since the introduction of digital technologies. Recently we have access to a wide range of software tools that can support almost any aspect of learning, communicating, creating and performing work.

Well-known examples for learning software are "Improvisation Technologies" by William Forsythe, "Double Skin Double Mind" by Emio Greco/PC, or the educational software "Wild Child" by Bedford Interactive. There are also several artistic interactive CD-ROMs/DVDs and online projects to work with, such as "Waterfall" by Richard Lord, or "Mouse. Dance" by Neil Zusman and Arthur Aviles. These projects share many characteristics with "Dance on the Screen" or "Video Dance", which has become a genre by itself, and is intrinsically connected with video editing and post-production software. For this kind of work it is very helpful to work specifically with the space as the camera "sees" it, and the implications and possibilities that arise from working based on often non-linear narrative structures, as opposed to real-time live performance.

Character animation software is based on similar principles as video editing and post-production software. Some software has been developed in collaboration with choreographers, such as Merce Cunningham and Thecla Schiphorst.

Life Forms and Dance Forms, Poser and Character Studio (now a plug-in of Autocad Max 3D) are popular programs, which continue to be explored in different directions, often in combination with 3D Motion Capture technologies. On one hand the cinematic industries employ character animation software for large-scale movie projects. On the other hand the exploration of humanly impossible movement through animating 3D figures in innovative ways has led to interesting experimentation with the adaptation of these animations by real human dancers. New movement possibilities and vocabularies can be created through the work with these programs.

Fascinating possibilities also emerge with the combined use of 3D Motion Capture technology. The dancers are equipped with a set of markers, which communicate the spatial position at any given moment. These data can be applied to a human figure (an "avatar"), but are also frequently used to generate 3D graphics or architectures in real-time during a performance. Data can also be used to generate sound and music. In this kind of work the dancers become visual artists and/or composers as the move, which again requires a whole different kind of training.

As 3D Motion Capture technologies are very cost intensive, many dance companies, universities and art schools cannot afford them. Parallel to the work for the camera and the exploration of character animation software a whole range of software and programming environments have been developed during the past decades, which enable the user to interact with and manipulate all kinds of digital media (images, graphics, videos, animation and sound) in real time. Typically one or more video cameras or web-cams are used to track the dancers' movement. In a comparatively simple set-up the dancer's body contrasts with the background. Based on the difference of luminosity or colours it is possible to isolate the figure(s). These (2D) Motion Tracking/Computer Vision technologies don't create data files like in 3D Motion Capture. Instead they transmit numerical values referring to a set of parameters (horizontal and vertical position of the centre or bounding box of the figure (object that is tracked), size of object, velocity etc.). These numerical values serve as input to manipulate all kind of parameters of the media one wants to process, for example the colour, luminance, threshold, layers, size, speed or fragment of a video clip.

Most of this software is very affordable, but varies considerably as far as programming skills are concerned. Processing, VVVV, Max/MSP, Eyesweb, VNS, EyeCon, Pure Data and Isadora are well-known tools used by an ever-growing number of artists from very different fields. As motion tracking, or gesture analysis, is the starting point for many real-time interaction and media processing systems, dancers and performers have been involved in many collaborative artistic projects. Today they are increasingly solicited for interdisciplinary research projects to further develop sensorial technologies. Personally, I have found the software Isadora the most accessible and intuitive program to work with.

3. Resisting (recent) technology
Frequently individuals who work in the performing arts voice a certain resistance towards using computers and recent digital technologies. This seems hard to understand given that many of them are familiar with and use hardware devices in classes, rehearsals and performances, as mentioned above.

If we look at the dominant discourses underlying scientific work on one hand and artistic work on the other hand, it becomes clearer, that doubts and resistance towards recent technologies are deeply rooted in sometimes opposite value systems (Wilson 2002). Characteristic of the techno-scientific discourse is the belief in constant progress, the claim that technology will better human life, and the quest for universally valid discoveries. This discourse is substantiated on the basis of an impressive record of inventions and new technologies, which certainly have transformed the world in the past centuries.

In Critical Theory deconstruction of sets of values, language systems, and meta-narratives are central themes. Naturally the narrative of progress is put into question, as well as the dominance of certain cultural streams. Science's claim for universal truth and objectivity is critically reflected, as well as Art's claim to represent a higher, avant-garde vision.

Throughout the 20th century we can observe traditions in all of the Performing Arts, to critically reflect social, cultural and political conditions surrounding and influencing the production of art works. It is therefore quite natural that art has been increasingly and predominantly informed by Critical Theory, particularly dance, as the theorization of this art form is a far more recent phenomenon.

Furthermore, the origins of many recent information and media technologies are military research projects (for example the Internet), whose objectives and visions are rarely shared by today's artists. How should we make use of technologies that apparently contradict (in their conception and planned application) central values and convictions of those artists who see their role in society as public figures that critically reflect the present life condition on a global scale?

According to Stephen Wilson (2002) there are various stances today's artists hold towards the use of recent technologies. For example, an artist today often is an integral element of interdisciplinary research teams, and in this role co-shapes and contributes to the investigation. Another possibility is reflective and critical use of the technology in question during the creation and presentation of the artwork. Other artists may decide to make alternative use of a technology,

³ See also Stephen Wilson on several definitions of technology.

which has not been considered before and constitutes a surprising viewpoint. Yet another group is not interested in the underlying principles and uses a particular technology towards their specific ends.

In my own artistic work I have pursued yet another approach. Following the same critical and reflective approach to information and New Media technologies I have examined what a certain technology can do to correspond to a well-defined artistic purpose. This rather pragmatic approach towards new technologies includes the conceptual level: sometimes I find it far more interesting to learn from a Media artist, which compositional tools and principles he//she employs, than trying to integrate multimedia technology in my dance work.

I believe this approach resonates with choreographer William Forsythe, who called his working method in the 1990s "Improvisation Technologies". This approach implies an understanding of technology as "the knowledge how to do something", or "the means to create something".³ From this viewpoint technology is not reduced to hardware and software, but explores cross-disciplinary conceptual potential. I suggest that when it comes to evaluating any new technology, discussion should therefore neither be limited to merely utilitarian views, nor to exclusively ethical perspectives of the intended use or application. A broader discussion of any new technology should reflect concern for the way we research, communicate and apply new knowledge.

4. Dance Labs
The concept of the (artistic) laboratory has been frequently employed over the past decades in order to denominate a form

of research, which in fact can be linked to long traditions in the arts. Gloriana Davenport (2004) states that a core methodology of the MIT Media Lab is the "atelier". This French term is used to describe ways in which fine artists have been working for centuries. The idea of the atelier is often connected to a master and his/her disciples collaborating on a larger project. The daily work at the atelier included teaching skills, experimenting and refining new materials, and discussion. Similarly experienced scientists, artists and professors collaborate with their students on research projects at the MIT Media Lab. Davenport mentions that academic activities, such as teaching classes, frequently trigger interesting research questions. Artistic research naturally involves developing new technologies and devices at the Media Lab, and eventually results in the presentation of prototypes, which are presented to sponsors and the industry.

In 2007 I had the opportunity to visit the Biennial Rencontre-i at Grenoble in France. Part of the program was a guided tour to the Minatec Ideas Laboratory (CEA), directed by Michel Ida, which allowed for an insight to the collaborative research conducted by an interdisciplinary team of artists and scientists. Choreographer and dancer Anabelle Bonnery for example has been participating in the development of sensorial technology. At CEA watch-like sensors, fixed to hand and feet, have been developed, which measure position in space and acceleration of movement. Data obtained by these sensors are imported to the software Max/MSP to generate musical structures in real time. Bonnery's bodily training and knowledge has been essential to this project, which aims at discovering what kind of gestures can produce what kind of sound.

Dance Labs in general work on the same premises as many media labs. Artistic ideas and research questions are formulated and tested in a methodological way to produce knowledge in the form of prototypes.

French choreographer Kitsou Dubois, who I also met at Rencontre-i, showed "Zero Gravity Dance" work, which she developed on the base of several sessions at NASA, where she experimented with zero-gravitation. She had been invited to prepare astronauts physically, and in turn got the rare opportunity to work with dancers at the Space Lab.

Bonnery's and Dubois', work are examples for temporary project based dance-labs, which is probably the most common format.

A different approach are short-term research laboratories based on specific topics, such as the international Think Tank on "New Performance Tools: Technologies / Interactive Systems" organized by Scott deLahunta and Johannes Birringer at the Ohio State University in 2002. This research laboratory brought a variety of specialists together to share and reflect about this particular topic. In this case a different kind of knowledge was produced, which can contribute to develop a cross-disciplinary "meta-methodology" of the field in question.

Portuguese choreographer João Fiadeiro organized during the 1990s a series of annual cross-disciplinary LABs. While every LAB was conceived independently and thematically diverse, the series allowed witnessing the evolution of artistic research in contemporary performance in Portugal, and some of its protagonists. Today most dance-labs are organized within artistic residencies as part of the production of dance works, within larger scale research projects organized by universities, or in collaboration with other disciplines and institutions.

Concluding this brief overview of dance lab formats, I would like to mention the Dance Lab founded in 2004 at the FU Berlin in Germany. Under supervision of Gabriele Brandstetter the Dance Lab is part of the Institute for "Theaterwissenschaften" (the term literally translated reads "theatre sciences", and focuses on the production of "Körperwissen", i.e. bodily knowledge as an alternative to educational knowledge). The Dance Lab focuses on three areas of investigation: knowledge produced through and by the body, reflection about human perception and movement as a multifaceted phenomenon, which permeates all aspects of life.

This research agenda provides a solid conceptual framework for the lab, which allows for designing curricular activities, artistic projects and collaborative cross-disciplinary investigation.

Considering the aforementioned examples of Dance lab technologies, I suggest six categories of constituent elements of the Dance Lab.

1. Time

As we have seen, artistic laboratories in general and dance labs in particular can be short-term, one-off initiatives; they can be organized periodically and in series; they may consist of a longer specific research project; and they may be conceived as an ongoing activity on a regular bases.

2. Place

According to the nature of the lab in question, the artistic research may take place in the facilities of host organizations, or several of these, and they may find a permanent, sometimes custom-built home. Peter Stamer (2005) makes an interesting claim, when he states "knowledge is choreographed topographically". This certainly corresponds to many artists' experiences of working at specific locations with its particular conditions.

3. People

In the same way every single participant in a dance lab plays a unique role and makes a clear difference through their individual contribution, labs may involve a permanent staff or team of collaborators, or they can be designed for very diverse groups of participants.

4. Ideas

The major objective of organizing a dance lab is to test artistic ideas and to develop and refine further research questions.

5. Methodology

Stamer (2005) asserts that the classical model of the laboratory (hypothesis and verification/falsification) is essentially different from the model of the artistic laboratory. According to him the latter is based on "divergent thinking", which integrates the formulation of the research questions as part of the experimentation (a question leads to the re-formulation of the same question, or to new questions).[4]

[4] For example: Mario Pricken analyzed more than 10000 successful publicity campaigns and presented 200 compositional principles in form of his "Clicking Question Catalogue" as a powerful tool to stimulate creativity in any of the Visual Arts. In a later publication these questions became the base methodology for his "Visual Lab".
 In Dance one of the best--documented examples is the creative process of Pina Bausch, who uses the research questions methodology extensively.

[5] See Callesen and Nilsen.

6. <u>Outcomes</u>

A Dance Lab frequently leads to the development of prototypes, or "beta-versions" of a new performance format, a specific interface, or appropriate creative strategies.

The idea of producing prototypes includes conceptual advances and methodological improvements that can be made available for the interested public.[5]

5. Working with students at the ESAD.CR

For the Open Class series organized by PAR at ESAD.CR I aimed at presenting examples of ideas that can be developed and tested in a dance lab environment. Given the time constraints of my Open Class (a single 90 minutes lecture demonstration) I decided to focus on highlighting a few modes in which the software *Isadora* can operate within the context of Dance Improvisation. Three experiments were prepared with a group of second year drama students.

As mentioned above, *Isadora* is software which allows for the real-time processing of still images, video, sound and graphics. These different media can be manipulated through various sensors used by life performers, or through other devices that provide numerical input. *Isadora* is a graphic programming environment that allows the user to create custom-built systems in an intuitive way, as the knowledge of programming languages is not required.

In an allusion to theatre production, software designer Mark Conniglio named the main elements of an *Isadora* document "stage", "scene", "actor" and "groups". Every set of algorithms is visually represented as an "actor", a module that is selected in the Video, Audio, MIDI, Generator, Mouse&Keyboard, Calculation and Control group in accordance with its specific function, and then dragged and

dropped onto the "stage". Connections between modules are made through links, and numerical values can be adjusted in small windows within every module.

Probably the most basic set-up in *Isadora* is the connection between a movie--player and a projector module, which can be compared to hardware devices, such as a common DVD-player and a TV screen or video projector. The advantages of using the software to reproduce a video clip become immediately apparent: several parameters of both modules permit sophisticated playback options. For example, any fragment of the clip can be selected; speed can be flexibly and gradually regulated forwards and backwards; an image can be flipped, rotated and multiplied.

Exercise 1
Following a short introduction of the *Isadora* software in the beginning of the Open Class, we proceeded to demonstrate how a movement sequence can be learned more efficiently by making full use of these playback possibilities.

In repertory, improvisation and composition classes this simple set-up represents a powerful tool. Besides learning a sequence quickly and efficiently, movement can be visualized in a way that compositional principles become tangible. Fragmentation, accumulation, changing speed and timing, trying an upside-down version, or creating complex canon-like structures are but a few possibilities. Some of these principles used in improvisation originate from musical composition; others have been adapted from film and video, such as "fast forward" and "rewind". This first exercise focused on the perceptional of the five categories of improvisational resources, where compositional principles are either familiar, or not important to the exploration.

Exercise 2
In the following experiment we explored the transfer of a compositional principle from video to dance improvisation. In other words, this experiment falls into the conceptual of the five categories of improvisational resources.

As one of the objectives of this Open Class was to encourage the audience to experiment themselves with the software at home, we made use of a pre-designed set-up entitled "scratch" which is explained by Conniglio in the tutorials.

A mouse watcher module is added to the movie-player and projector modules. Horizontal movement of the computer's mouse determines which fragment of the video clip is shown on the screen. As the speed is set to zero, the mouse movement also determines at what speed and how much of the fragment is shown. If the user moves the mouse quickly left and right, the "scratch effect" is achieved, similar to the DJ's and VJ's technique.

The improvisation task for the students was to transfer the idea of "scratching" to their previously learnt movement sequence. As this idea represented a new compositional principle, students had to "translate" the concept of "scratching" into familiar terms, such as fragmenting the movement sequence, forward and rewind a movement, and change its speed and timing.

In their exploration they would face diverse challenges, including going against the natural flow of the sequence, or controlling the weight and balance in unexpected ways. Difficulties with very detailed memory of the phrase would arise, and sometimes rewinding the movement could be very awkward or even impossible, particularly in jumps and falls.
In a subsequent phase the students started to evaluate and memorize their favorite improvisational moments. A few dancers were selected for a group improvisation and asked to develop a sense of connection between their scratched movement fragments. This experimentation proved very successful, as the performers confidently used the new principle ("scratch") to communicate amongst them.

Exercise 3
The third experiment aimed at showing how identical compositional principles function in different artistic languages. In both the areas of dance improvisation and programming media, we focused on the generation of new movement sequences employing random procedures to assemble fragments of existing material.

For this purpose we chose to work based on movement sequences taken from a section of the dance film *Roseland* by Wim Vanderkeybus.

A video clip of this section was programmed in *Isadora* in a way that short fragments of two or three second randomly fade in and out. In an allusion to the original version of *Roseland*, in which three couples dance similar duets simultaneously, we split the screen in three areas, where the video fragments would randomly appear.

Isadora allows to resize each part of the split screen horizontally and vertically, and to present it in 3D perspective. These possibilities are very interesting for stage designers, as constituent elements of a single video image can be independently adapted to and projected onto different scenic elements. Each part of the split screen had a different perspective and spatial depth, resembling the choreographic staging of the duets in *Roseland*. We suggested in the Open Class that beyond the static staging of video projections, one can imagine the importance of choreographic thinking when it comes to programming the motion pathways and dynamics of projected images and screens.

To prepare for their improvisational task, the students had previously learnt 15 short movement fragments of the *Roseland* duets, identical with those appearing and disappearing on the screen. Now they were asked to assemble the learnt fragments into a random choreography as they were improvising. Fragments could be repeated and connected in different sequences. In order to successfully realize the task, students needed to quickly choose fragments and find a physical logic to connect them. Memory and preferences for certain fragments were issues to be addressed as well.

The improvisational process as a whole was very interesting to watch, because even though there were no aesthetic criteria for the students' decision-making, the improvised performance of the *Roseland* movement fragments in front of an audience had a clear compositional structure and aesthetically intense moments. How did this happen? Friederike Lampert (2007) suggests that choreography (or dance composition) can be seen as "slowed-down" improvisation. Inversely

improvisation can be seen as "instant choreography", or real-time composition. Her model of the improvisational process shows that the improviser passes through phases of disorientation, chaos and destabilization, and phases of finding new orientation, new order or structure and stability. Lampert describes this process as "movement between chaos and order".

I believe that the intense struggle to trust their bodily knowledge and experience, while the students explored generating the new movement sequences, represented a captivating drama of artistic creation for the witnessing audience. Beyond the aesthetic and compositional concerns a fascination with the present moment was felt: what is going to happen next? And where? How will a movement relate to the previous fragment we just saw? These kinds of questions naturally arise when random procedures and generative techniques are employed, no matter what the artistic language is.

As mentioned above, we presented the *Roseland* duets in a split screen mode and used the randomly generated fragments as a visualization of the concept we wanted to use in the improvisation. But simultaneously we also intended to present interesting possibilities for stage design.

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CONCLUSION

In other words, the experimentation with and transfer of compositional principles and techniques can be bi-directional. The past decades have seen the adaptation of quite a few principles from the visual arts and film for choreography, but dance has only begun to "export" its knowledge.

Dance as the study of movement provides a bodily knowledge, which can help to contribute to improvements in many areas such as Design. A variety of workshops with Design students from different disciplines have shown me that improvisational exercises from the first three categories introduced above (physical/sensorial, perception and conception) definitely helped these students to develop better motion graphics, kinetic typography, or stage and ambient designs.

I support the vision of the founders of the famous art school Bauhaus, who believed that the study of movement should be an integral part of the training of any artist, and consequently offered a movement course for every student in the very beginning of their training.[6] In my view the hybrid nature of Contemporary Art and Performance requires a collaborative effort of students, teachers, academics and artists to reform the artistic training offered at the present. I feel strongly that we need to develop a much more holistic, cross-disciplinary and international vision of artistic education and practice. Hopefully some of the concepts and ideas outlined above will be a contribution in this sense. •

[6] See the work of Gertrud Grunow, who taught the "Harmonisierungslehre" (a system based on Dalcroze she developed to harmonize the different art forms) 1920-24 at the Bauhaus.

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