New Aspects of
Print Simulation Training
in Higher Education

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Entering the World of Media in Stuttgart...

Impressions of our University:

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Impressions of our University:

HdM (Hochschule der Medien) at a Glance:

- Trains media specialists
- Approximately 4000 students
- Over 20 accredited study courses (bachelor and master)
- More than 6000 applicants per year
- Partnerships with over 40 universities worldwide
- State of the art equipment and software in labs and technical departments
- University continues to expand and grow
- High recognition factor worldwide

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Stuttgart Media University

Simulation Lab at the Stuttgart Media University

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In the year 2000,
Prof. Bernd Jürgen Matt,
a long time member of our
University Council Board,
had the idea to launch
a Simulation Lab
for Printing Processes
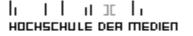at the HdM

2001 the Simulation Lab was Launched!

- Started with three Sinapse SHOTS stations for sheetfed offset printing

- One elective course was offered

- Main premise for the lab: "Optimization of Processes in the Printing Industry".

- The lab was primarily financed by the Friends and Support Association of the HdM e.V.

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2002 the Simulation Lab was Expanded

- One station for the Sinapse SIR software was implemented

- A manroland press console was purchased

- An additional elective course for the simulation of web offset printing functions was introduced

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Simulation Lab 2013

- Four Sinapse SHOTS stations
- Two Sinapse SIR stations
- One manroland software station
- Two press consoles from manroland
- Mandatory course for all PMM students held in English plus elective courses held in German or English
- An excellent working relationship with Sinapse and manroland exists for many years ☺

Simulation Lab 2013

Simulation Lab 2013

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Simulation Lab 2013

Why use Simulation Training at a University?

Why Simulation Training?

Print Simulation Software

- The number of students with any type of technical training has been decreasing the last few years.
  - *Germany has an excellent apprenticeship program*
- The time and costs associated with hands-on training on printing machines has increased and/or because of tight budgets or insufficient access time cannot be fully realised.
- Some of the existing equipment at universities is often old or doesn't reflect state of the art technologies.
- Institutional theory combined with practical working experience has always been a traditional HdM objective

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Why Simulation Training?

Print Simulation Software

- There are often great disparities between existing technical knowledge amongst students. Simulation software offers students who may have a certain "fear" to work on a printing press, the opportunity to explore all kinds of functions and build-up confidence.

- Hands-on training with fun exercises encourages students to ask questions and try different things, communicate with others in their team and contribute their own ideas. Its an intuitive and entertaining approach to learn about printing.

- Students learn how printing processes can be optimised and the impact on costs.

- Since most of the courses are held in English, students have one of the few opportunities at our university to learn technical printing terms in English.

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Why Simulation Training?

Overall Educational Areas

- Simulation offers problem based learning
- Students are participants and instructors are not just presenters of information
- Simulation is interactive, dynamic, motivating and fosters independent learning and critical thinking
- Students gain knowledge through trial and error
- Hands-on training allows students to learn better from their own experiences than having others' experiences related to them
- Simulations can be paused, whereas real life cannot

Why Simulation Training?

Overall Educational Areas

- Simulation training can be applied to nearly all kinds of industries or learning disciplines
- Its easily accessible, if need be 24/7
- Students receive feedback in response to their actions in a risk-free, persistent environment.
- When simulations are designed specifically for their audience, they can take developmental requirements into consideration
- Simulation is empowering; students take on responsible roles, find ways to succeed, and develop problem solving tools as a result of the interaction

Reactions
to
Simulation
Training

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Reactions to Simulation Training

Print Simulation Software

- Students react positively to hands-on training; only exceptions are those not interested in specific offset technologies. Surprisingly it's often these students who then get a taste of "virtual printing" and attend the second elective course.
- Students enjoy the visuals and having the time and freedom to explore various solutions/options.
- Students who have worked on a printing machine tend to test the system to the extreme! Some of them remark that there are certain factors which cannot be simulated, but they normally don't have a solution either. We always state that simulation is an excellent training tool, but not a complete replacement for a real printing press!

Reactions to Simulation Training

Print Simulation Software

- The confidence gained in discussing technical printing issues amongst inexperienced students can be observed each semester.
- The students work well in teams and the fun factor appears to be a strong motivational factor to learn more; they actively exchange ideas and also monitor each others progress.
- Alumni are often thankful for the "practical" training they received in the simulation courses and have had to apply the knowledge gained on the simulator when working in the industry.
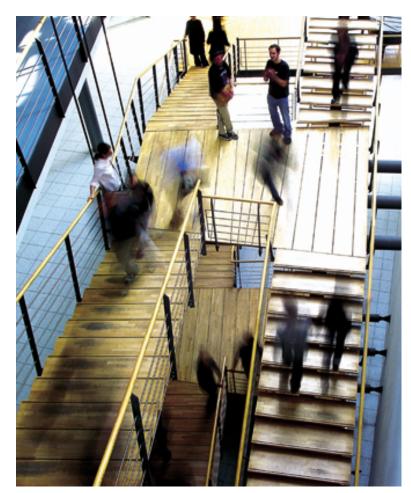
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Reactions to Simulation Training

- A positive aspect is the combination of fun and e-learning which appears to be particularly attractive to students.
- There are some errors in the software which we work around but as we all know there is no perfect software.
- Students are used to games and high tech software so often their expectations are very high with regard to what the software should be able to do.
- A TEE (Transfer Effectiveness Evaluation) is often difficult as students sometimes learn how to use the simulation software effectively instead of learning about the real life processes.

Stuttgart Media University

New Aspects
of
Simulation
Training

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Computing Power

- Cost of computing power continues to decrease making simulation a viable training method and increasingly interesting training tool.

- Simulation is moving away from traditional large hardware systems to virtual environments such as serious games.

- Advances in computing technology including processors, monitors, increased memory as well as video cards with 3D capability have made high quality synthetic environments inexpensive and highly immersive.

- Technology leaps with audio, video and high definition graphics is making sophisticated simulation software affordable.

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Serious Games

- Computer-based games have a powerful engaging effect. Finding ways to engage students in training or educational games with the same intensity users engage with traditional games could revolutionize instruction!

- Companies, universities and researchers have recognized this and are focusing on incorporating highly interactive computer-based games into a more serious role for education. So to say: "serious games".

- Economics alone do not fully account for the growing incorporation of simulation in education. Through advancements in software technology in all areas of life, students EXPECT interesting and user friendly applications for learning as well.

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Serious Games

- Winning the game should not be a primary aim for students taking part in a simulation; the focus should be directed towards everyone gaining some useful and relevant knowledge

- Students often require an extra boost to keep them entertained, especially when a simulation is run over an extended period, so serious games will be an important aspect in future education.

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Serious Games

- As training shifts from expensive high-end simulation solutions to serious games, the goals of the knowledge transfer have to be defined. Most simulation games have been developed for commercial reasons and education features are typically an afterthought.

- Many of the games currently used for training seem to be simply showcasing new technologies or repurposing an entertainment game simulation rather than being targeted towards the elimination of an instructional gap.

- Well-defined instructional requirements for training and/or instructional games will need to be developed to ensure the games are accomplishing the goals for which they intended, and that they are not just simply providing entertainment

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Blended Learning

- Learning in a simulated environment does not necessarily equate to an ability to perform tasks on the job or to transferable skills.

- Simulation as a supplement to other forms of education rather than as a stand alone medium for instruction has been proven to be the most effective application.

- Cross media blended learning concepts will continue to gain in importance.

- Integrated learning concepts that optimally utilize networking possibilities via internet or intranet, combined with classic learning methods and new media will change the learning environments not only in universities, but in schools, training sites, etc.

Blended Learning

Waddick Study*

- The incentive to use simulations over other media forms is that the hands-on learning experience either increases transfer or increases the efficiency with which knowledge transfer is achieved.

- Waddick evaluated a simulation designed to teach the use of a spectrophotometer to university students. He compared its effectiveness against a teacher demonstration and found the simulation and the teacher demonstration to produce equally effective performances using an actual spectrophotometer.

*Waddick, J. (1994). Case study: The use of a hypercard simulation to aid in the teaching of laboratory apparatus operation. *Educational & Training Technology International, 31*(4), 295-301.

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Languages

- The language function in the Sinapse simulation software used has greatly improved!

- Students are able to change the language within the exercise they're working on and computer generated audio options are also available.

- Multi-language applications are considered as standard these days by users and expected!

- Adapting simulation software to different languages, regional differences and technical requirements (internationalization and localization) will gain in importance as globalization increases.

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Personalized Applications

- In the near future, it will not be sufficient to merely present scenarios that approximate expected conditions and then expose students to these general circumstances. There will have to be a much more targeted approach as to what specific skills need to be trained and what component elements of such skill development can best be served by exposure to simulations

- The days of generalized simulations are numbered. The future will require greater flexibility and focus on the individual as designer, operator, user, trainee, or customer.

- University students will expect their respective simulation (s) to adapt to themselves and their own personal settings.

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Increased Interactivity

- Real-time interactivity as students are used to in games, will increase in future simulation software applications.

- Multi-user functions or comparing results with other students online (within the course, university or with other institutions worldwide) motivates students.

- 3D augmented reality environments can help improve interactive experience.

- For print simulation software more multi-media files and pictures could be kept on a central database to be downloaded by users worldwide.

- Interactivity with actual printing companies (as once planned by manroland) would provide students with real situations, problems, statistics, etc.

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Trainer Requirements

- Matching the most efficient type and category of simulation to train specific learning needs is a specialized skill and there is a shortage or gap in the training of simulation specialists who can effectively design and employ training simulation.

- The design of DIY simulation software is difficult as students vary in their base of knowledge. Trainers need to understand the real life processes as well as the simulation of these and keep updated with the fast changing technologies in both areas.

- Education for educators!

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Future Potentials for Print Simulation

- Better graphics and representation of costs.

- Personalized simulation for press operators, CSRs, management, etc. Identify the different knowledge needs of the trainee.

- Touch consoles (as pursued by Sinapse), user friendly hardware and software.

- Cloud based interactivity in exchange with other users.

- Better representation of new, innovative printing technologies on the market.

- More integration of videos and computer graphics explaining the basics of printing technologies.

- Simulation based software for print manager decisions (i.e. should I buy that new press?)

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Business Management Simulations

Business Simulation in General

- Participants in the simulation manage a (virtual) company. They will make typical business decisions in a realistic environment.

- They learn principles of business administration: how to use information in decision-making, and how to handle risk and uncertainty.

- They experience decision-making processes within a team while managing time constraints.

- Management simulations offer, through (virtual) experiences, a high degree of transferable knowledge and skills which participants can utilize in their daily work.

PMM/priME-Cup Business Simulations

- The priME stands for "print media" as well as "premium management & entrepreneurship".

- Board games with a focus on print and media and general management simulation

- The cup is a simulation game/business simulation contest for students with a nationwide impact. Developed from our study course Print Media Management it has become a model for networked entrepreneurship education in Germany including 14,000 participants since 2002.

- Invented and driven by PMM-Professor Dr. Helmut Wittenzellner

Benefits for the participants

- Transfer economical „statistics" into practical perceptions.

- Become acquainted with instruments of cost accounting, income statements and product calculation.

- Handle complex decision making under uncertainty.

- Setting of goals and strategies, decision making and the transfer in a team, using PC supported or board game planning models.

- Development and usage of trans-sectoral thinking and acting.

- Motto: "Learning entrepreneurship while having fun with the game".

Haptical Print Business
Simulations

PC-Based General
Management Simulations

Jury evaluating
student presentations

Conclusion

- The future of simulation is bright.

- Technological advancements in areas such as manufacturing, transportation, communications, and science are rapidly changing our world.

- Innovations in training will be needed to meet these new requirements. Not only must graduates, professionals, workers, etc. become proficient in using these new technologies, but shrinking manpower requires more cross-training, self-paced training, and distance learning.

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Conclusion

- Universities, including those in the print and media areas will have to re-evaluate their teaching methodology and implement new technologies such as simulation training, to improve the transfer of knowledge.

- As the printing industry goes through massive changes which ultimately also affects university funding for print related educational areas, simulation will increasingly be an inexpensive option to teach university students printing technologies and management expertise.

- Reducing the complexity in education of today's faced paced changing technologies is a great challenge. Virtually all areas where humans pursue understanding can and will benefit from the dynamic and malleable representations that simulation renders.

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Questions?

- Please don't hesitate to contact me should you wish further information:

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Thank You for Your Attention ☺

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