

Organisation POLE



Lead POLE **Prof. Dr. Christoph Holliger** University of Applied Sciences Northwestern Switzerland School of Engineering / Academy of Art and Design Klosterzelgstrasse 2, CH-5210 Windisch tel +41 56 462 44 06 / +41 62 777 27 75 christoph.holliger@fhnw.ch



Lead POLE **Prof. Dr. Ing. habil., Dr. sc. techn. Wilfried J. Elspass** University of Applied Sciences Zürich School of Engineering / Institute of Mechatronic Systems Technikumstrasse 5, Postfach, CH-8401 Winterthur tel +41 58 934 7828 - fax +41 58 935 7828 wilfried.elspass@zhaw.ch



Lead POLE **Prof. Sebastian Stroschein** University of Applied Sciences Northwestern Switzerland Academy of Art and Design Bahnhofstrasse 102, CH-5000 Aarau tel +41 62 832 66 66 stroschein@stroschein.de



Organisational Assistance Hans Peter Wyss University of Applied Sciences Northwestern Switzerland Steinackerstrasse 5, CH-5210 Windisch tel +41 56 462 49 76 hanspeter.wyss@fhnw.ch



Technical Assistance Information and Web Technologies **Robin Oster** University of Applied Sciences Northwestern Switzerland Steinackerstrasse 5, CH-5210 Windisch tel +41797355911 robin.oster@fhnw.ch



Technical Assistance Information and Web Technologies **Michael Raps** University of Applied Sciences Northwestern Switzerland Klosterzelgstrasse 2, CH-5210 Windisch tel +41 56 462 40 80 michael.raps@fhnw.ch

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POLE - A Platform for Learning and Teaching

University students are nowadays increasingly challenged within their specific core disciplines; in addition however, they are also supposed to develop skills in order to apply this particular knowledge in practice. This ideally goes hand in hand with a sense of maturity of the individuals' characters vis-à-vis the social, cultural, and economical environment. The practical application of theoretical knowledge can thus only be implemented successfully if these three basic elements are taken into account.

In addition to university students' disciplinary knowledge, the ability to work efficiently within multicultural environments has become increasingly important. Universities are therefore looking to expand and deepen this particular aspect in order to provide the necessary expertise in this field. This realisation has led to universities becoming more proactive with regards to networking and offering joint courses, which is where POLE (Project Oriented Learning Environment) is actively involved in. In the course of this new collaboration, it has become apparent that the complementary aspect has gained in importance. An example for this is the liaising between strongly research-oriented and more practically oriented universities with the common goal of being able to implement the according results as soon as possible. Apart from contributing to more comprehensive and efficient process work, the POLE courses lay particular emphasis on improved cultural know-how.

In order to do this, students are encouraged to contribute their experiences within international teams, regardless of geographical and language barriers.

POLE sees itself as a learning system cooperating with other European or international universities. It does so within a reflexive context, taking into account the various cultures involved in order to create new methods of resolution regarding teaching and learning methods. The students are at the core of this concept, and are given the option to develop process-oriented expert knowledge through interdisciplinary teamwork. Simultaneously, they learn to work independently and to deal with current problem cases through the use of modern information and communication tools.

Processes within POLE are largely organised within the individual teams themselves. The according goals are set and committed to within the teams; in case of resulting conflicts, weight is given to iterative processes in order to find solutions. A further characteristic of POLE is an increasing tendency for the overlapping, or even amalgamation, of various lines of work in order to give way to new, holistic, and interdisciplinary perspectives. POLE is a comprehensive platform which gives students the opportunity to contribute their full potential. Each individual's attitudes, characteristics, and abilities are taken into account as a

whole in order to allow as much space as possible for independent development of students' responsibilities and skills. A contribution to the concept of 'Campus in Mind' is made by POLE in providing the multi-disciplinary teams with learning facilities that are based on experimental and interactive technologies.

The teamwork in the POLE courses allows the students to further expand their specific professional skills, on the other hand; it also gives them the opportunity to develop more generic competences, which nowadays is one of the key qualifications in order to be able to adapt to a continuously changing environment. The course also enables students to evaluate their ability to function in a team and to analyse their styles of communication. Through practical examples, students are given the opportunity to explore how well they are able to work in a team, and to what degree they are flexible to accept members' concerns from other disciplines, i.e. how they can integrate these into their own work and patterns of thinking.

Experts and mentors which do not form part of the university, but are active members of businesses and the industry in general, are an essential part of POLE courses. Their participation contributes a high degree of practical knowledge to the projects, pointing out the actual 'state of the art'. In this manner, POLE manages to link academic education and professional practice. The intensive interaction between these two elements guarantees a rapid transfer of technology, while at the same time ensuring that the students involved are motivated to a high degree.

POLE is not only about to significantly remould the landscape of teaching and learning at universities, but it also intends to wield substantial influence concerning decisionmaking and the creation of practical work processes. In association with university teaching staff, the mentors are instrumental in contributing expert knowledge and regular feedbacks to the teams, while they are also actively involved concerning the evaluation of processes and related products. The latter will be of increasing importance in the future, as scientific research has been initiated in connection with reflections of certain POLE processes. It is the intention of this kind of research to support students with regards to the awareness of their personal learning styles. The findings will then be made accessible for future work in a broader context.

Further POLE research issues include for example the creation of knowledge databases, which will serve as a tool for more rapid evaluation of solutions and decision making processes in the future. These efforts are based on the knowledge that a large part of creational, construction, and design processes are substantially shaped by re-design.

The initial POLE courses had been launched as a result of the ever increasing demands in the current building trade, which is of a highly complex, segmented, and competitive nature. Experts from the fields of architecture, civil engineering, and construction management are clearly demanding a broader education, along with more diversified core skills for engineering students. The POLE learning environment and its associated methodology is not limited to this initial context, but allows students from practically any discipline to apply their theoretical knowledge in practical cases. Through collaboration in interdisciplinary teams guided by process management students, students from fields such as architecture, urban planning, civil engineering, interior design, plastics engineering, mechanical engineering and economics were given the opportunity to cooperate in POLE projects and thus better understand the individual processes involved and acknowledge their relation to the social, economical, and political dimensions.

The present POLE course offered during the spring/summer semester 2009 will bring together the disciplines of industrial and product design, mechanical engineering, electrical engineering, computer science, plastics technology as well as material science and process management with students and faculty from University of Applied Sciences Northwestern Switzerland, Swiss Federal Institute of Technology ETH Zürich, Zürich University of Applied Sciences, Helsinki University of Technology HUT (Finland), Aalborg University (Denmark), Tecnológico de Monterrey (Mexico), Technical University Delft (NL) and Olin College Boston (USA).

Responsibilities of POLE and its Partner Universities

POLE considers itself as a learning platform which enables and facilitates interdisciplinary processes. It has also proven to offer an excellent test bed for research in the field of modern teaching and learning as well as in the field of evaluation of novel learning spaces. At the same time it is important to put on record that the responsibility for the disciplinary supervision of the students remains with the sending home universities. This relates also to the grading of the students' contribution. POLE on the other hand will provide a qualification on the team processes and on their interaction patterns. (It is suggested that students who successfully participate in POLE projects receive academic credits based on the ECTS.) The experience during the previous POLE courses has revealed that this double responsibility of the student towards his/her POLE team and towards the home university and professors, respectively, may also bear conflicts. POLE demands that team decisions be respected what the approach and the agreed objectives is concerned; POLE leaders are convinced that within this frame work there is still ample tether to adhere to high academic standards in the disciplinary work.

Saying this makes it obvious that a close accompaniment and monitoring of the project by the faculty of the partner universities is essential and highly welcomed by POLE. The involved faculty will receive full access to all documents of the POLE project. Their participation during the kick-off events, the reviews and the final presentations will add to the interdisciplinary depth and thus to the quality of the project and to further developments of POLE.

Assessment

POLE has the ambition to continuously improve its learning and teaching platform. One step to do so is by integrating an external assessor into the process, who will participate in as many of the POLE design activities. POLE has cooperated in this field of evaluation and assessment with the Department of Education of the University of Applied Sciences Northwestern Switzerland and with Stanford University since the very beginning in the year 2000. The participatory assessment will focus on the effectiveness of the design processes and the adequate use of collaborative communication technologies.

Driven Driver Project Task Theme: Innovative Concepts for the Car of the Future

Automobiles constitute the backbone of today's transportation system. Mobility has strongly contributed to the unprecedented growth in Western industrial nations and to the individual freedom of people. A fundamental relinquishment of individual cars cannot be anticipated since passengers as well as freight traffic have been constantly growing in the past decades. On the other hand a clear call for innovation in safety components, intelligent navigation systems and infotainment for the future car can hardly be overheard. In addition, we can observe a growing awareness and research activities in the field of carbon neutral automobiles.

Volkswagen has always been among the leaders in innovation for car design. Only through their continuous efforts for perfection and on an extensive corporate engagement could recent contributions like the 1-Liter-Car or its convenient distance control system become a reality.

Under the premise that with growing automation, the driver of a car will - especially during boring rides on the highway - be able to delegate more and more control functions to intelligent systems, new possibilities for self-defined activities will open up. As an example we can anticipate the future driver focusing on various multi-media applications while a computer guides him/her safely and stress-free to a destination - all supported by an information system that is continuously up-dated with current traffic data. Such a vision for the car of the future necessitates the reflection on the qualities of existing and dreamt-of functionalities. The task of the present POLE project Driven Driver will be to conceive and then design such futuristic tools, build functional prototypes and interfaces for them in such a way that they can be tested by a special simulator; a high-tech system which Volkswagen is willing to make available to each team. Any wild functions and gadgets the teams can think of are welcome to be integrated in this prospective project which has a time horizon of 20 years. Saying this, it becomes clear why such an endeavour can only be tackled by multidisciplinary teams consisting of product and industrial designers, material scientists, mechanical and electrical engineers, computer scientists, psychologists, systems and mechatronic engineers as well as coordinating business engineers. Only an interdisciplinary discourse will allow for meaningful solutions which embrace sensory systems, ergonomic principles, electromechanical boundary conditions, communication aspects, as well as - most importantly - the "human factor".

Process Design

POLE as a platform for learning and teaching not only focuses on the product but puts strong emphasis on the structuring of the design process. The following list of deliverables shall facilitate the work process for the teams as a back bone.







Deliverables I

At the end of the kick-off week (February 15, 2009):

- Written statement of the team's objective(s)
- Concept of the information management (using ICT) by each team
- Description of the anticipated contributions of each student as a member of her/his team
- Commitment of each team member on a (preliminary) milestone structure

At the first review (Videoconference; March 10, 2009):

(duration of presentations 30 minutes/team)

- Product definition and list of requirements
- Verification of team's collaboration strategy (List and structure of teams' documents)
- Clarification of contributions of each team member (written document); reflection about changes or confirmation of one's own role within the team
- Intermediary results, presented on the intranet
 (1 day prior to the review to make sure the data can be displayed)
- Refined sketches of envisioned product

At the second review (Videoconference; April 17, 2009):

(duration 30 minutes/team plus 30 minutes discussion):

- Intermediary results, presented on the intranet (1 day prior to the review)
- Verification of roles within the team
- Selection of validated concept
- 1st versions of all deliverables due at the final presentation
- Clear concept of final prototype
- Definition of remaining milestones (segmentation; who does what?)

Final presentation (June 4, 2009; in Wolfsburg)

Presentation of all relevant results on POLE's Driven Driver Project intranet portal. (by June 2, midnight) Note: Inputs will be blocked thereafter!

- Oral presentation (duration: 45 minutes/team) for colleagues, faculty and jury
- Demonstration of functionalities using Volkswagen's simulator
- Fulfilment of targeted specifications
- Potential for future research and development of Driven Driver follow-ups
- Detailed evaluation of individual learning and insights
- Comments on success factors and/or pitfalls of interdisciplinary design teams

• Suggestions for future POLE projects

• Oral presentation of a management summary for a delegation of Volkswagen's directorate (duration 10 minutes/team)

Deliverables II (hard copy) At the end of the kick-off week:

- Written statement of the objective(s)
- Concept of the information management (using ICT) by each team

Stopover one (March 6, 2009): Specification of requirements (draft version) by each team

At the first review (March 10, 2009):

List of documents and document structureRefined sketches of envisioned product

Stopover two (March 13, 2009): Specification of requirements (final version) by each team

At the second review (April 17, 2009):

- Refined process plan (milestones) for final phase of the project
- List of target specifications

Final presentation (June 4, 2009):

- Visualisation of proposed design by 3D renderings.
- Prototype or mock-up of final product
- Comprehensive documentation through physical documents (e.g. scaled technical drawings according to production standards) of

- product - usability

• Video simulation of operational procedures

• Documentation of development and team process



Information and Collaboration Technologies ICT

POLE is offering a modern infrastructure with respect to information and communication technologies (ICT). POLE encourages the partner universities to support their students with respect to ICT as much as possible, in particular granting them access to their own information technologies.

The following list of ICT tools characterizes the necessary standards:

- 24 hours per day access to work stations, so students can work on their tasks and are able to communicate at all times
- Access to telephones with international access for conference calls
- Video conferencing facilities (available at least 2 hours per week and team)
- Suitable IT support (firewalls, basic support)
- Broad band internet access
- MS-Office including PowerPoint, Acrobat Reader, ZIP and FTP programmes

During the kick-off sessions POLE will provide instruction in the use of data transfer tools for the sharing of the use of video conferencing as well as in disciplinary applications. Restriction: It must be noted that for synchronous communication there is only support provided by POLE for operating systems Windows 2000 (and higher). The POLE ICT experts will also assist the teams in terms of security of internet interactions in the confidentiality context.

Team Composition

The POLE Driven Driver course is based on the partnership of University of Applied Sciences Northwestern Switzerland (with its faculties of industrial design, plastics engineering, electrical and mechanical engineering and computer science, process management), Aalborg University (department of production and institute for architecture & design), Zürich University of Applied Sciences (school of engineering), ETH Zürich (department of mechanical engineering), Helsinki University of Technology (departement of engineering management), TU Delft (Faculty of Industrial Design Engineering), Olin College Boston (department of design and mechanical engineering) and Tecnológico de Monterrey (departments of design, computer science and mechanical engineering).

Approx. 30 students in five interdisciplinary teams will work on the design and development of a novel concept for the "car of the future" for Volkswagen, Wolfsburg, Germany under the guidance and supervision of more than 10 faculty members.

Evaluation Criteria

The evaluation of the project results will be in the duty of an international jury. It will consist of one member of each discipline and two members of the POLE directorate. Each team will receive a report with an acknowledgement of the contributions according to the following criteria: (1) fulfilment of Volkswagen's requirements (a list of specifications will be handed out during the kick-off week by the patron), (2) usability, (3) innovative potential of solutions, (4) presentation of product, (5) general impressions.

Confidentiality Agreement

Due to the high potential of such a novel product Volkswagen and POLE have agreed to respect a confidentiality agreement which in turn has to be signed by all partners involved in the project.

Individual copies for each participant will be ready for signature at the kick-off event.

Budget for production costs

Each team is granted a budget of max. CHF 2'000 for material and production expenses. Payments can only be made by POLE against bills or (signed) receipts.

Cost of living and accommodation

Thanks to the financial support of sponsors and the industry partner Volkswagen, POLE is able to partially subsidize the cost of living and those for the documentations and hand-outs for the participating students. Nevertheless, a contribution total of 200 Euro for the kick-off week and the final presentation events will be charged to each student. The participants are also responsible for insurance matters.



Program Spring/Summer Semester 2009

Kick-off	Event	
Wednesday February 11, 2009	Arrival of Students and Guests	15:00
	Welcome	15:30
	POLE - What is It?	16:00
	Task "Driven Driver"	16:30
	Coffee Break	
	Team Formation I	17:30
	Dinner	18:30
	Team Formation II	20:00
	My Discipline - Our Task - Our Team	21:00
Thursday February 12, 2009	Breakfast	08:30
	Team Building Exercise I	09:00
	Input Volkswagen	10:00
	Lunch	12:00
	Team Work I / Reflection on Input VW / Questions to VW	13:00
	Input to Dragons Diapping	
	input to Process Plaining	14:30
	Team Work II (First Draft of Process Plan)	14:30 15:00
	Team Work II (First Draft of Process Plan) Coffee Break	14:30 15:00 16:00
	Team Work II (First Draft of Process Plan) Coffee Break Team Work III (Identification of Work Packages)	14:30 15:00 16:00 16:30

Friday February 13, 2009	Breakfast	08:30
	Input to Product Dougloomont	
	(Process)	09:00
	In the subscription of the	
	input for ICT and Video Conferencing	10:00
	Excursion (Brown Bag Lunch)	12:00
	Open End	

	Lunch	12:00
	Project Management II (continued)	
	Individual Dinner (Organized by Teams)	
	Team Work (Preparing Presentation)	open ended
Sunday February 15, 2009	Breakfast	08:00
	Group Work (Getting Ready for Presentations)	08:30
	Lunch (Sandwiches and Drinks)	12:00
	Presentation 1 (incl. Feedback from Faculty and Coaches)	12:00
	Presentation 2 (incl. Feedback from Faculty and Coaches)	13:00
	Presentation 3 (incl. Feedback from Faculty and Coaches)	14:30
	Presentation 4 (incl. Feedback from Faculty and Coaches)	15:30
	Presentation 5 (incl. Feedback from Faculty and Coaches)	17:00
	Apero / Clean Up	18:00
	Assessment/Questionnaire	18.30
	Re-Design of Process in Teams	19:00
	Farewell Dinner	20:00

Kick-off

Saturday February 14, 2009 Event

Breakfast

Project Management I (Time Line, Documentation; Team Structure, etc.) 08:30

09:00

Course Dates	Event
February 11, till February 15, 2009	Kickoff-Meeting
March 10, 2009	Review I (by Videoconference from Home Universities)
April 17, 2009	Review II (by Videoconference from Home Universities)
Around June 1	Arrival of students according to team's decisions
June 4, 2009	Presentation of Results to Volkswagen, Wolfsburg, Germany (All teams, faculties, jury members, industry partners)

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POLE Project University of Applied Sciences Northwestern Switzerland Klosterzelgstrasse 2, CH-5210 Windisch, Switzerland christoph.holliger@fhnw.ch

Layout and illustrations

Prof. Sebastian Stroschein Gabriella a Marca, Zurich

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