

INTEGRATING ART AND SCIENCE EDUCATION THROUGH DESIGN – THE ARTEM PROJECT

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ABSTRACT: (MAX 150 WORDS)

There is a general notion that design is a suitable way to bridge the gap between art and science. Universities and schools have tried to bridge this divide in various ways with sporadic degrees of success. This paper focuses on an innovative project that goes one step further.

The University of Nancy (France) has instigated a project called ARTEM. This is an alliance between the ICN Business School, the School of Mining/Engineering and the National School of Art of the University. It combines the disciplines of art, science, technology and management. The objective is to offer students teaching which combines various forms of knowledge, intelligence and creativity. The three schools function interactively and offer several curriculum bridges.

ARTEM will reach full maturity in 2011. The purpose of this paper is to present this on-going project where design is used as a mechanism for integrating disciplines.

1. INTRODUCTION

Higher education in today's global environment needs to find new ways to evolve in order to meet the increasing demands from students, companies, and governmental bodies. Global trends to these demands involves cooperation between different universities and colleges in different countries through networks like Cumulus (ref.) and Erasmus (ref.), and has lead to the evolution of for example students graduating with double degrees. On a university level, colleges are starting to find ways cooperate and integrate their curricula by finding common bridges for cooperation. This can be done in for example the areas of project management and innovation, where business, engineering, and design all have a common interest.

Lately, design has also emerged as one of the areas that some believe is the solution to these changing conditions. Due to the popularity of the word design, it is often used in a very broad context. Besides the core design educations (both art and science based ones) focusing on for example industrial design or textile design to name a few, other disciplines are starting to integrate design into their curricula as well. In a broader perspective, design can be used as an integrating theme for both education and research. In 2003, at the 3rd Doctoral Education in Design/6th Asian Design Conference in Tsukuba, Japan, discussions regarding the benefits of single department programs versus collaborative programs involving more than one department, school, or university were addressed. Strong arguments for a better integration of art, engineering, science, and humanities were made and examples from different parts of the world were presented.

Another popular way to show initiative in keeping up with a changing environment for universities is to seek cooperation with the business community. Cooperation is often carried out via internships, guest lectures by company representative in class, and empirical collection of information for student projects or thesis work.

This paper addresses the progress and plans of the current project ARTEM in France that is aiming at integrating a multitude of the different educational changes that has been addressed above.

The word ARTEM comes from the words, art, technology and management. ARTEM is an alliance between three French institutions of higher education in Nancy, France. The schools concerned are:

- The "Ecole de Mines de Nancy" Nancy Graduate School of Mines/ Engineering
- The ICN Business School
- The Ecole Nationale Supérieure d'Art de Nancy, (National School of Art of Nancy)

The alliance enables the schools to enrich their teaching resources and to enlarge the skill levels of their students by blending art, technology and management.

2. HIGHER EDUCATION IN FRANCE

Higher education in France is divided into two systems, the university system, which is public (state supported and financed) and open to all French high school graduates and the Grandes Ecoles system, (which was started by Napoleon). The Grandes Ecoles are a system of private, graduate schools with high tuition and admission by competitive examinations, (both written and oral). The Grandes Ecoles do not exist in all subject areas. Prominent subject areas are engineering, business, art, architecture and political science. Families in France prefer to send their children to a Grandes Ecoles rather than a university because graduates of these elite schools find jobs easier than do graduates of the universities. Because the Grandes Ecoles are expensive in relation to French universities, the system has been criticized as fostering an elitist system.

All three ARTEM alliance schools are Grandes Ecoles and are members of the Conference of Grandes Ecoles in France. It should also be noted that the Grandes Ecoles are Graduate Schools. Students enter via competitive examination after completing 2 years of university level preparatory studies or 2 years of regular university studies, and then spend 3 years at the Grandes Ecole and graduate with a Masters degree.

French universities traditionally do not maintain a single unified campus, as is the case in many universities around the world. The University of Nancy, which was founded in 1572, enrolls over 50,000 students. It has traditionally been divided into 3 different universities, The University of Nancy 1, which has the faculties of medicine, pharmacy, sciences and mathematics, dentistry,

and sports, The University of Nancy 2, which is comprised of the faculties of economics, law, liberal arts and social sciences, technology, business, cinema and audiovisual, and the INPL, (sometimes referred to as The University of Nancy 3) which is composed of 8 engineering schools. Each school, or faculty, maintains a separate installation and students enrolled in one faculty do not mix with students from another. Students studying chemistry, for example, take all their courses at the science faculty, while psychology students take all their classes and the liberal arts campus. There are virtually no exchanges between students or faculty in any of the arms of a French university. To have 3 separate schools work together is revolutionary in France.

3. A UNIQUE ALLIANCE

More and more today the success of a commercial project depends on the triangle of skills, which are design, manufacture and management. Job profiles for executives today also demand multiple skills for new types of jobs at the meeting point of technology, art and management.

ARTEM is an inter-university group reporting to three government ministries: the Ministry of National Education and Research, the Ministry of Culture and Ministry of Industry. (See figure 1 below for an overview.) The project is unique in France. It will carry out interdisciplinary research, offer interdisciplinary teaching, and achieve an intercultural synergy including arts, technology and management disciplines. On a national policy level, it is considered a pilot project for the modernization of the French university teaching practices and research. The objective of the alliance, which is also highly supported on a regional level by, the Nancy universities, (in particular by the Institut Polytechnique de Lorraine, (INPL) on behalf of the Ecole de Mines and the University of Nancy 2, on behalf of the ICN), the Greater Nancy Urban Community, the Lorraine Regional Council and the Meurthe-and-Moselle General Council, is to offer students from the 3 institutions teaching which combines various forms of knowledge, intelligence and creativity. Shared courses, projects and joint training groups are at the heart of this new plan. The 3 schools function interactively and offer several curriculum bridges. In 2011, they will be brought together in a single, original and multidisciplinary campus in the center of Nancy.

The ARTEM project began in the year 2000 and will reach maturity in 2011 with the completion of a new campus complex for the 3 schools. The campus will have over 5,000 students, professors and researchers. ARTEM is an alliance of artist/designers, engineers and businessmen, the

disciplines of art, science, technology and management, the know-how to conceive, produce and negotiate, to form a new generation of leaders.

National Supporting Actors

- Ministry of National Education and Research,
- Ministry of Culture,
- Ministry of Industry

Regional Supporting Actors

- University of Nancy,
- Institut Polytechnique de Lorraine,
- Greater Nancy Urban Community,
- Lorraine Regional Council,
- Meurthe-and-Moselle General Council

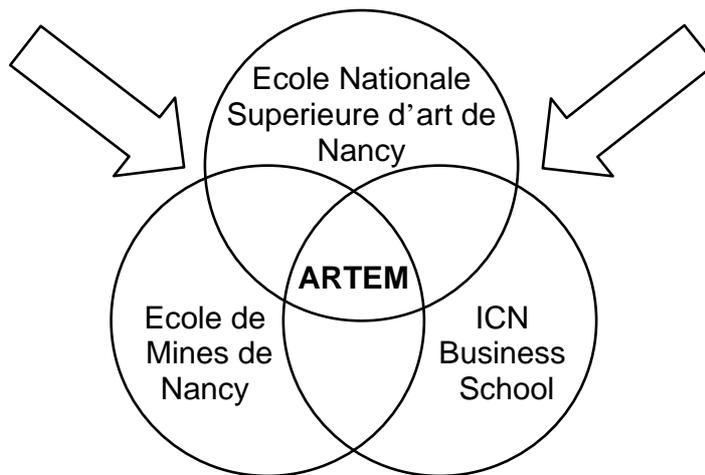


Figure 1: ARTEM schools and supporting actors.

The teaching system is based on the dynamics of art, technology and management. It combines the integration of new technology in the firm, creation of new professions at the meeting point of technology, art and management, development of more sensitive aesthetic tastes and a better understanding of the creative process. Students have the possibility of choosing one day per week in a workshop at one of the three schools, in subjects ranging from economic intelligence to e-commerce, to environmental design, to multimedia.

4. THE ARTEM CAMPUS

The future campus is the largest university project in France. It will house the 3 schools together with the Jean-Lamont Institute, a research center from the CNRS, (National Scientific Research Center)

The Parisian architect Nicolas Michelin, was selected as having the best design after an international competition, in which architects from Switzerland and Holland, were among the 6 finalists. The complex will combine Nancy's art-nouveaux heritage with a Guggenheim inspired modern art design.

The campus will be a blend of glass and gardens and the showpiece is a large solar heated partially-enclosed gallery (350 meters long) which will connect the 3 schools. The design idea of the architect is "to create a university campus completely open to the neighborhood and not enclosed upon itself. That is why we have designed a large public gallery which runs parallel to the street and which at the same time gives access to the schools" (Le Moniteur, November 10, 2006) The campus will be built on a 10 hectares site and the buildings will occupy 70,000 square meters.

5. THE WORKSHOPS

One of the centerpieces of ARTEM is its workshops. These workshops bring together student from the 3 schools. They are on current and controversial topics and are designed to be laboratories for research, taking research to practical levels. For the professors of the schools, it provides an opportunity to prove and expand their research theories. Many of the ARTEM workshops are company sponsored and respond to the needs of the business community.

Students in engineering, business and art tend to have different personalities, (at least they do in France) and having them all in class together is a challenge. Workshops are taught by faculty members from all three schools. Each school proposes their own workshops.

In theory, ARTEM workshops are designed to be linked to research conducted by the professors of the 3 schools. In effect they are designed to develop and prove theories. They also offer collaboration with partner universities and thus create opportunities for international research.

In business, ARTEM workshops are often tied to marketing research, to see if markets exist and to see if products and theories have merit. Companies easily profit from these workshops using them as free or low cost field work studies programs. The workshops ask faculty and companies CEOs the following question, what do you want to prove, what do you want to test?

There is a “cutting edge” aspect to ARTEM workshops. This means they should be on topics which are not usually taught in universities. They should be on current and controversial topics. They should be “laboratories for research”, taking the research to practical levels. ARTEM works reflect an experimental, innovative and take a risk, aspect.

Up till now there have been several problems with the workshops, and this reflects the French educational system.

- The overwhelming majority of the workshops are taught in French and this limits the participation of international faculty and reduces the “cutting edge aspect”
- The workshops are not always based on research but rather on what a professor normally teaches. Therefore too many are simply too mundane.
- There is a large difference between the workshops given by the 3 schools. The ICN is incontestably more international than the other 2 schools. The most traditional and therefore most French is the School of Fine Arts, when by definition they should be the most liberal.
- Workshops are simply “flipped over from year to year” rather than replace with new cutting edge topics. This is because the job of coordination is handled by administrative personnel who look for the simplest and not always the best solution.
- Coordination between the 3 schools is not easy
- The students are flexible than the professors and the professors more flexible than the administrators. The administration of the schools does not integrate well.

6. THE PROJECTS

The projects are the other important aspect of ARTEM. The projects are based on the idea that researchers, professors, and students can be mobilized to design, build and manage specific projects tied to regional or national needs. Each year a group of companies, (ARTEM Business partners) proposes projects for the students and their professors to work on. Some examples of recent projects are:

Dupont Medical is a company that manufactures medical devices and instruments for the health care industry. Some of the products it manufactures are stethoscopes and blood pressure measurements.

The project it gave ARTEM was to help develop an examination table that could be used in doctor's offices and hospitals. The project would be to design a new table, using different material and build a prototype, then conduct market research to see the viability of the product. The project thus effectively combines design, engineering and marketing research.

A second project sponsored by Dupont Medical was to design a wheelchair that was more comfortable than those in use. Dupont Medical is one of the principal manufacturers of wheelchairs. Products are used principally by old and handicapped people. Dupont wanted a design which would be more adapted to older people. Again the project included design, the building of a prototype and a market research study.

Another was sponsored by BNP Paribas Bank. The project consists of organizing a marketing research study among young people (primarily students) concerning their banking habits and needs and to design a cyber bank in the neighboring city of Metz.

Some projects are ongoing, and are passed on from year to year to different groups of students. One such project deals with climate change. The project consists of modifying the motors of certain cars so that they will run on vegetable oil. The technical modifications necessary are based on the Elsbett kit which is available in Germany. This is the first time the method has been tested in France.

A small community in the region of Nancy was selected and the agreement of the regional authorities was obtained. The French carmaker Renault has lent sponsorship to the project.

7. THE BAR CAMP

Bar Camps are similar to the concept of "happenings". These impromptu events flourished in New York in the 1960s. In England, the first happenings were organized in Liverpool in 1965. In Australia, the Yellow House Artist Collective in Sydney staged 24 hour happenings throughout the early 1970s.

Bar Camps is a form of Foo Camps, an invitation-only event hosted by publishing figure Tim O'Reilly. The Bar Camp is an international network of unconferences, open, participatory workshop events, whose contents are provided by the participants. The camps are organized largely through the Internet. The framework for the Bar Camp is similar to Open Space methodology for organizing meetings but is general more informal in scope. They generally consist of sessions proposed and scheduled by participants using white boards and paper boards. While loosely structured, there are rules. All attendees are encouraged to participate and to share information and experiences both live and afterwards via blogs, web channels and photo sharing.

ARTEM will hold its first bar camp/happening on the weekend of October 13th, 2007. The project will consist of an invitation only weekend of 48 hours for 20 professionals and educators involved in the health care industry in Nancy. Participants will be "locked up" for the weekend, without cell phones and elements of distraction.

It should be noted that one of the most important faculties of the University of Nancy is the medical school and that the University Hospital is one of the most highly reputed in France. Health care is the most important industry and biggest employer in Nancy.

The bar camp will be organized around idea generation on how to improve certain aspects of health care. Participants will be given a seminar on idea generation and brainstorming before the bar camp begins. This is important because brainstorming is a highly familiar, but to some degree tired tool for gathering and developing new ideas. Every business uses brainstorming, whether internally in the conference room, or by bringing in consultants to help generate ideas on specific problems. Everyone is convinced they're doing something meaningful, when in fact brainstorming sessions are never as productive as they could or should be. The October bar camp will be based on new research on brainstorming by professors of the ICN Business School.

The purpose of the weekend will be to generate ideas and to stimulate people to think radically about procedures they do not question on a daily basis.

8. TRANSVERSAL ASPECTS OF THE ARTEM PROJECT

The word transversal is one which comes up often when you speak of ARTEM in Nancy. It implies cooperation between the schools and between the people in the schools.

Is the project really a transversal one, or is it just the overriding idea which sounds wonderful in theory but does not work in reality? It should be noted that the three schools involved in this project are similar and yet have significant differences. The ICN Business School, (Commercial Institute of Nancy) has EQUIS accreditation (<http://www.efmd.org/equis>) and is in the process of acquiring AACSB accreditation (<http://www.aacsb.edu>). These international business accrediting associations require a substantial international orientation. The other two schools have a far more national and even regional orientation. As of today, ARTEM has really no international presence. Almost all the published information is in French (see reference list for a selection of articles and web links). The ICN has a different concept of ARTEM, and different requirements than the other schools. The engineering and art schools have a more traditional point of view toward ARTEM and do not see the need to internationalize it.

The driving forces behind the transversal elements in ARTEM are, not surprisingly, the students. Faculty and administration, being conservative in nature, resist change and see information as a tool of power and as things to be guarded rather than exchanged. Globalization is forcing people to work more and more closely with people who do not share the same backgrounds and orientations. We all tend to consider ourselves as unique beings, but tend to see others as representatives of groups. Everyone is born into a series of reference groups. Other groups we acquire over time. The following are the major reference groups in society: race, religion sex, national origin, profession, language, teams, clubs and associations. While it is natural to like and be proud of our reference groups, the notion of belonging to one country, one religion, one team leads to a preference for that country, religion and team and then to the idea that others are inferior. The transversal nature of ARTEM is important because the French education system does not foster contact between diverse groups. The eventual internationalization of ARTEM is also important since French students designate language and then national origin as their principal reference groups.

9. CONCLUDING COMMENTS

This is without doubt a large project where the outcome of many of the activities will not be possible to fully assess until much later in time. The trend within the academic education system is currently to give students a learning opportunity with a higher degree of integration of different disciplines in order to prepare them better for their future careers where design will be an integral part. As can be seen in the ARTEM project so far, there are numerous challenges to integrate

so many different parties and expect them to work together. The three schools, faculty, and students, all have to rise above cultural differences and traditions in order to make this vision come to full completion. The ambition is high and the resources are in place for the ARTEM project to become a success - time will tell how well it will work out.

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