Educating Educational Designers: The University Of Twente Case

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Summary

How do you efficiently and effectively educate students to be academically competent and practice-oriented educational designers when they lack prior design experience? This papers provides an answer to this question by describing and discussing a four-year University program in instructional design and educational technology. The program incorporates substantive developments in the field, and uses authentic and partly technology-based approaches to teaching and learning educational design.

Introduction And Problem Statement

The basic curriculum question 'what knowledge is worth teaching' is very actual for those engaged in teaching designers. While we are changing our views on how designers work in practice, we need to reconsider the basic design models and design knowledge we are teaching (novice) designers. And there is also good reason to question whether the traditional teaching pedagogies are still sufficient to introduce novices to the field. Despite some good examples or ideas for the education of designers (c.f. Dorst & Reymen, 2004; Rieber, 2000; Rieber, Orey, & King, 2006; Schön, 1987; Rowland, Fixl & Young, 1992; Shambaugh & Magliaro, 2001; Visscher-Voerman, 1999) the attention for this topic lags behind the attention for what designers actually do. As a first and important step towards further increasing the quality of design education, it is important for educators to share their assumptions, theories, and experiences with teaching designers and to provide their answers to the afore-raised question. It is the intention of the authors of this article to share their assumptions, views and experiences with teaching (novice) designers in their program, as it may inspire other design educators.

The authors work as teachers and managers in a four-year educational design program at the University of Twente in the Netherlands, which recently celebrated its 26th anniversary. An important feature of this program is its multidisciplinary educational design orientation. This orientation was inspired by the North American tradition in the field of instructional design and educational technology, a field that encompasses the systematic analysis of learning and performance problems, and the systematic design, development, implementation, evaluation, and management of instructional and non-instructional processes to improve learning and performance in a variety of settings (Reiser & Dempsey, 2007).

Whereas there is overlap with a lot of design programs all over the world, this program has three distinct features. First, it is the only four-year design program in the Netherlands, with a 100% focus on educational science and technology. It consists of an undergraduate level (first three years of the program leading to a bachelors degree) and a graduate level (last year of the program leading to a masters degree). Whereas most students enrolling the undergraduate level are novices to the field of educational design, the graduate level designates students with a basic level of design knowledge or experience.

A second major feature of the program is its aim to educate students to be able to work in both academic settings, e.g. as design researchers, and professional contexts, e.g. as designers or as consultants.

Third, the program has a broad focus, providing theory, design perspectives, and research approaches in several educational domains (curriculum, learning and instruction, media, educational organization and management, educational measurement, and human resource development). Because of this broad focus, the term 'educational design' has been used rather than 'instructional design', as the latter evokes too much of an association with business environments (Richey, Fields, & Foxon, 2001; see also van den Akker & Kuiper, 2007).

As the basis of this program are four major design principles, e.g.:

- Design principle 1: Initiation into the academic profession as guiding pedagogical approach
- Design principle 2: The instrumental approach as leading pedagogical device, but with sufficient attention to various other main design approaches
- Design principle 3: Explicit coupling between generic and domain-specific design approaches and principles
- Design principle 4: Explicit coupling of educational design and research

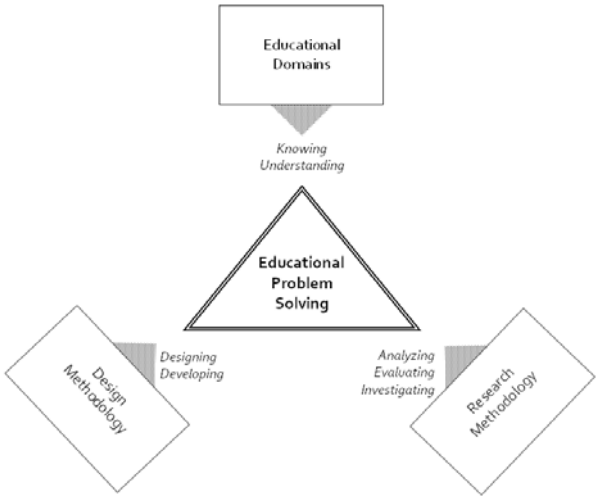
In this article, the authors will first describe the program as a kind of advanced organizer. Secondly, they will articulate the rationale and indicate why and how these design principles permeate the program, embedding them in both developments and trends in the design field and own experiences. Thirdly, the authors will provide evaluative data from a survey amongst alumni and an external university audit to sketch how this program is valued by both practitioners and academics. It is not so much meant as to proof or disproof the quality of the program, but to provide the reader with the complete picture, from curricular intentions to teaching practice to results. Fourthly, in the same line of reasoning, the authors raise several issues and bottlenecks, stemming from the program, its underlying rationale, and the experiences. The reader may be inspired to judge to what extent ideas and elaborations may be relevant for their own design teaching context.

Description Of The Bachelors And Masters Curriculum

The current bachelors program has evolved over 25 years. Although major elements have been there, the design principles have only been formulated recently.

There have been formulated 5 competence areas for the program, which stem directly from the program's focus on educational problem-solving. In order to analyze and understand educational problems students need theoretical knowledge (reflected in competence area 1: domain knowledge) and research skills (reflected in competence area 2: research competencies); in order to solve them, they need design/development and research/evaluation knowledge and skills (reflected in competence area 3: design competencies) (see Figure 1; adapted from Verhagen, 2000). To operate within the triangle theory-design-research, students require social, communicative, information technology, and reflexive skills (reflected in competence area 4: general academic and professional skills). Since many designers come to work as consultants in either the design or research area, the students also need to master advisory competencies (competence area 5).

Figure 1. Educational problem solving



These competencies apply to both the three-year bachelors program and the one-year masters program. The only difference is that in the masters program the competencies are related to one specific domain and students are expected to demonstrate a higher level of mastery, as formulated in the European 'Dublin descriptors', with respect to 'knowledge and understanding'; 'applying knowledge and understanding', 'making judgments'; 'communication'; and 'learning skills' (see Joint Quality Initiative, 2004). All competence levels get equal attention in the programs, except for the advisory competencies which are devoted less time.

Structure Of The Bachelors Curriculum

The Educational Design Management & Media (EDMM) program consists of four main components, in which several courses are clustered. In Figure 5 the structure is visualized. This is not a chronological structure, but a content-related structure where the arrows show which courses are related. The student study load of each course is being expressed in terms of European Credits (EC), with one EC equaling 28 hours of total student work. This may include attending classes, reading, group work, working on assignments, writing reports, and meeting teachers

for feedback depending on the amount of independence expected from students. As such, each academic year matches 60 European credits; the full bachelors program consists of 180 EC.

The first component consists of the *foundational courses*. Here, an introduction is provided to the field of education and training; to related domains of psychology, sociology, andragogy, and pedagogy; and to one of the educational domains, human resource development. In these courses, students acquire basic terminology and create a knowledge base that they can rely on in other courses.

Second, the *design stream* consists of an introduction course and five design ateliers in combination with nine supporting courses. The first four ateliers are linked with a specific educational domain (media; curriculum and instruction; organization and management and human resource development; and evaluation and assessment). The fifth atelier fully consists of an authentic 'synthesis' design project to be conducted in groups in the domain of choice. In the course 'Educational design: Introduction' an introduction is provided to design methodology in general and to each of the specific ADDIE-phases and activities in particular. In the ateliers, students practice design techniques and methods in each of the domains with increasing complexity.

Third, students in their third year should choose several courses in a discipline different from the educational domain for a broader academic orientation. This set of courses is called the *minor* and stems from the University of Twente philosophy that attending courses in other domains develops and broadens students' academic competencies, such as communicating with professionals from other disciplines, having a broad perspective on science, and being able to master new topics relatively quickly.

Fourth, the *research stream* consists of six courses and, at the end of the third year, an individual research project. In the courses students are taught research methodology, research designs, methods of qualitative and predominantly quantitative data gathering, and statistical analysis techniques. The research assignment (more or less in a design context) requires a student to demonstrate his or her competencies as a junior researcher.

Structure Of The Masters Curriculum

In the masters program Educational Science and Technology, students narrow their specialization further in one particular educational domain. They choose one out of three different tracks: Curriculum, Instruction & Media Applications (CIMA), Educational Measurement, Evaluation, and Assessment (EMEA); or Organization Psychology and Human Resource Development (OP&HRD). The masters program is comprised of 60 EC, and can be attended full-time (one year of study) or part-time (two years of study).

Each of the masters tracks consists of three different chronological components. First, the introduction course of 5 EC provides a domain-specific overview and specifies the content areas to be taught or competencies to be developed in the track.

Second, there are two core and three elective courses of 5 EC each. The core courses explore the domain in more detail and relate to one or more of the general competencies. In the elective courses, students can broaden their knowledge and skills within either the masters track or in other tracks depending on their specific interests.

Third, the specialization phase is comprised of 30 EC. In this phase, students conduct a review of literature on research or design methodology, and on the content of their final design and/or research project. The other 20 EC are used to conduct the final project and to write the scientific thesis.

Design Principles Permeating The Bachelors And The Masters Curriculum

Now that the reader has a general picture of the structure of the program, we share the design principles that underlie this program and that helped us to focus choices with respect to content, pedagogies, assessment, etc. In this section we provide some illustrations and indicate (where possible) where they are clearly linked to each other.

Design principle 1: Initiation In The Academic Profession As Guiding Pedagogical Approach

Throughout the program, students must be prepared for the roles of academically qualified professional designer, researcher, and advisor. They are expected to acquire theoretical knowledge, to build design/development and research/evaluation knowledge, and to develop the creative ability to choose and apply a combination of those skills to fulfill design, research, and consultancy tasks in known and unknown authentic situations (see also Figure 1). In view of that and inspired by the Studio Experience at the University of Georgia (Rieber, 2000; Rieber, Orey, & King, 2006), a pedagogical approach is intended as initiation into the academic profession (Verhagen, 2000). Students are induced to develop their competencies through conducting authentic tasks, both individually and collaboratively. During all these activities, teachers assume the role of masters, showing students in words and

actions how academic professionals would act. Students are increasingly expected to act as independent self-regulating and autonomous academic professionals. Therefore, the amount of one-on-one time between students and teachers gradually decreases, whereas the complexity of the assignments increases. The role of the teacher slowly shifts from instructor to coach and master. In the third year, students work on two large assignments supervised by a teacher: a design project in groups and an individual research project. The combination of these two projects constitutes the final stage of the bachelors program. The initiative is placed with the students, but teachers are very approachable with flexible schedules. In this respect it is important to realize that the financial reimbursement for teachers is the result of the quotient of the number of EC times the number of students attending the course. It is not, as is the case in many countries, related to the number of formal contact hours with students. As a result, it is easier for teachers to develop learning activities that ask for a reasonable amount of student independence and to provide flexible supervision geared to the individual or group needs. This culminates in a master-apprentice approach. Working on authentic assignments is considered the bridge between theory and practice. Students learn design skills through working on authentic assignments (mostly in groups). Assignments may include a multimedia product for an educational purpose (Atelier 1), a web quest as an application of instructional theory (Atelier 2); a written advice for organizational (re)structuring, school policy or human resource development policy (Atelier 3); or a professional project proposal and offer, as well as educational materials such as lesson series on math for autistic children or an electronic learning environment for higher education students, (Atelier 5). In the course 'Curriculum, Instruction and Media: Practical Orientation' practice is further intensified through cooperation with a teacher college in the neighborhood. In all these situations, students are expected to draw on theory, which is offered in the foundational courses and in the nine theoretical courses within the ateliers.

Practice comes into the program not only through authentic assignments, but also through alumni or other practitioners who incidentally function as guest lecturers (for instance, Human Resource Development Theory) or in a jury to assess student work (Atelier 3).

The concept of master-apprentice also permeates throughout the masters, but here, contact time with teachers is increased since there is only one year of study.

Design principle 2: Attention To Various Design Approaches, With The Instrumental Approach As Leading Pedagogical Device

Over years, the field has expanded to all education and training sectors manifesting itself in a rich variety of instructional or educational design theories and models for various problem types and multiple settings (see for example Andrews & Goodson, 1991; Gustafson & Branch, 2002). Some of the design models are conceptual while others are procedural (Richey, 2005). 'Procedural' models represent recommended ADDIE-based steps to follow in a design process. The majority of these models pertain to either large or small scale comprehensive design projects. They are, for the most part, derived from applications of general systems theory. Other procedural models like Gagné's (1985) Events of Instruction Model, for example, address more specific aspects of the design, development, and evaluation processes. 'Conceptual' design models identify variables that impact the design process and show their interrelationships. An example of these types of models is the Five Domains of Instructional Technology Model (Seels & Richey, 1994).

More recently, analyses of professional design practices have shown that design approaches are much less homogenous and much more diverse than suggested in literature, due to differences in the kinds of design products to be created, design contexts, and the designer's personal preferences and amount of experience. For instance, some designers follow the ADDIE phases successively or linearly, while others jump back and forth between different phases and/or conduct activities concurrently. Part of these differences can be traced back to the basic assumptions of designers on what is a good design and what constitutes a good design process. Acknowledging this, Visscher-Voerman and Gustafson (2004) distinguish four alternative design paradigms and underlying rationalities, instrumental or 'planning-by-objectives', communicative or 'communication to reach consensus', pragmatic or 'interactive and repetitive try-out and revision', and artistic or 'creation of products based on connoisseurship'. In their study, they found designers, not only with instrumental rationality (amongst 14 interviewed professional designers) but also with a communicative rationality (7) and three designers with a pragmatic rationality.

Not only in practice can be found an increase in other approached than the instrumental one, this holds also for academic design projects. For example, amongst academic design projects in the University of Twente, we view an increase in particularly the pragmatic paradigm, as an exemplification of design research (see below) (e.g. McKenney, 2001; Nieveen, 1997; Keursten, 1994; Roes, 1997; Thijs, 1999; van den Berg;1996; Visser, 1998; Voogt, 1993).

The vast expansion of design theories, models, and approaches made us realize that these different approaches should be addressed in the program to some extent. At the same time, it has been our experience that

students, being novice designers without any experience, profit most from learning to apply a sequential and structured problem-solving design approach. Therefore, it is considered important to use the instrumental approach as a basic 'pedagogical tool'. This means that students should first become familiar with the ins and outs, in theory and in practice, with this approach before moving to other approaches. The instrumental way of designing, provides novices with clear guidelines and steps for all kinds of design activities that could be conducted in a variety of design processes and contexts (Visscher-Voerman, 1999). It can also serve as a baseline against which theoretically different and innovative notions can be discussed (Self, 1997).

At the same time, however, students need to learn about and experience other less structured design approaches, such as the communicative, pragmatic, and artistic approach, to develop from a novice to a more experienced designer. During the program, they need to develop sensitivity to different design process options and become more flexible in choosing one approach. In the courses Educational design: an Introduction, the four paradigms are introduced to the students, with an emphasis on the instrumental approach. Atelier 1 asks students to apply the instrumental approach, atelier 2 guides students through a pragmatic approach, atelier 3 leans towards the communicative approach, atelier 4, again, is instrumental. In atelier 5 students are expected to deliberately choose and justify a design approach, and then reflect on its merit. However, it is our experience that students primarily and rather spontaneously apply an instrumental problem-solving approach even at the end of the program. In general, part-time students with more practical (design) experience are more able to value the different design approaches and put elements of those approaches into practice. In the masters program, the generic model is also followed, but tailored to the more domain-specific design model from the respective masters track (see also next design principle).

Design principle 3: Explicit Coupling Between Generic And Domain-specific Design Approaches And Principles

Studies of design practice have shown that design processes are highly influenced by various factors in the design context, such as the type of problem to be solved and the type of intervention to be designed. These factors have been incorporated into design-specific models (some of which have been mentioned above), and as such those models are quite helpful in addressing domain-specific accents, interests, needs, and wishes regarding design approach and interventions. Design models in the domain of educational media, for instance, provide clear guidelines for user-interface design or design of web-sites, and in doing so create a preference for pragmatic approaches. While facing the ultimate challenge of bridging the gap between policy intentions, classroom practices and student gains, curriculum developers use or might want to rely on models and approaches emphasizing iteration, formative evaluation, and deliberation. The field of human resource development concerns a range of non-training interventions like coaching programs, on-the-job learning programs, or competency profiles, and thus stresses socio-professional design activities that might be reflected in communicative approaches.

In view of helping students develop the competencies envisaged, it is considered of major importance to not only highlight the main domain-specific design models and approaches, but to also address commonalities and differences between the various domain-specific approaches, the models, and the four alternative design paradigms. Since the beginning of the program in 1981, the faculty has been organized into different departments, reflecting different educational domains. Because teachers from all departments participated in the program, input from different domains in the curriculum was guaranteed rather naturally. In the current bachelors program, there is more explicit attention for the relationship between generic and domain-specific design and these are deliberately aligned. This clearly shows in the design ateliers, which are specifically built around a certain theme, and where generic design activities are complemented with domain specific design approaches. In the first year of the course 'Educational Design: An Introduction', there is a 'professor parade'. During these sessions, six professors provide a two-hour sketch of their educational domain by illuminating specific design and research interests, themes and activities in relation to the generic model, and by explicitly focusing on the merits and shortcomings of the generic model for their domain. The masters further concentrates on domain-specific design approaches and principles.

Design Principle 4: Explicit Coupling Of Educational Design And Research

A recent development in the academic world is the emergence of and growing attention to 'design-based research' or 'design research' (van den Akker, Gravemeijer, McKenney, & Nieveen, 2006; see also Richey, Klein, & Nelson, 2004; Burkhardt & Schoenfeld, 2003; Design-Based Research Collaborative, 2003; van den Akker, 1999). Design research may be characterized as follows (van den Akker et al., 2006, p.4):

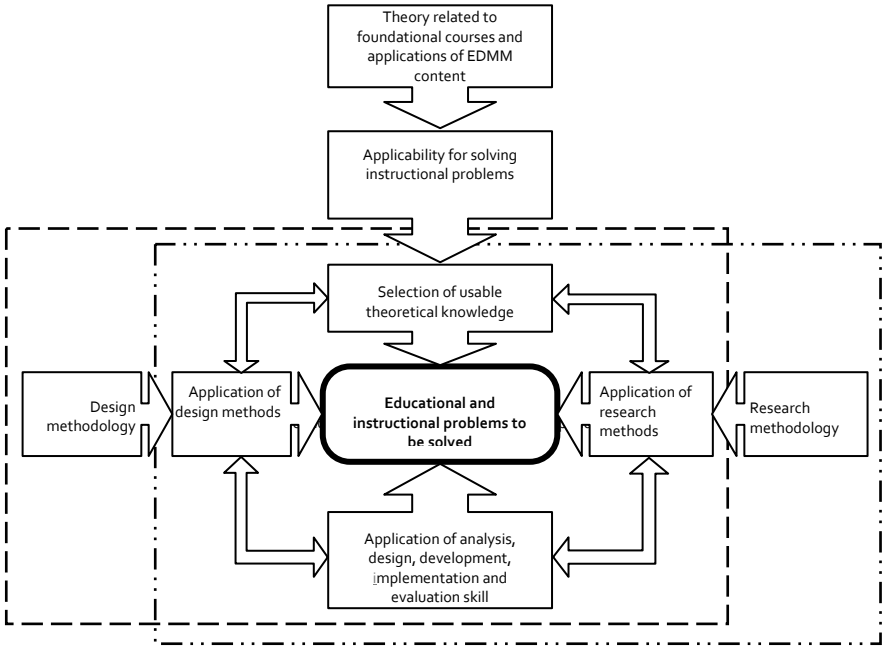
- Interventionist: the research aims at designing an intervention in the real world.
- Iterative: the research incorporates a cyclic approach of design, evaluation, and revision.
- Process-oriented: a black box model of input-output measurement is avoided; the focus is on understanding and improving interventions.
- Utility-oriented: the merit of a design is measured, in part, by its practicality for users in real settings.

- Theory-oriented: the design is (at least partly) based upon theoretical propositions; and field testing of the design contributes to theory building.

Following Barab and Squire (2004), van den Akker et al. broadly define design research as "a series of approaches, with the intent of producing new theories, artifacts, and practices that account for and potentially impact learning and teaching in naturalistic settings" (2006, p.5). They describe three motives for initiating design research: the desire to increase the relevance of research for educational policy and practice, the development of empirically grounded theories, and the aspiration to increase the robustness of design practice. Along with the pragmatic design paradigm, design-based research exemplifies the growing importance of formative evaluation during the design process.

Since its start the program has included courses on research methodology along with design methodology. Research methodology courses deal (amongst other things) with the development and use of a consistent 'research chain of reasoning' (cf. Krathwohl, 1998) which is the core of the so-called empirical cycle. With the growing interest in design research, what should become more manifest in the program is that the research chain of reasoning will gradually reflect academic skills that are also vital to the educational engineering processes. Design research requires the educational designer to conduct a systematic preliminary investigation of tasks, problems, and context. This includes searching for more accurate and explicit connections of that analysis with state-of-the-art knowledge from literature; formulating a guiding problem statement; reasoning logically towards a solution based on design principles derived from the preliminary investigation; and submitting the blueprint or a draft of intervention to a formative evaluation that uses the design principles as evaluation criteria. Figure 2 visualizes the analytical relatedness between research and design methodology.

Figure 2: The relatedness between research and design methodology.



In the bachelors program's research stream, students are taught basic research methodology with a primary focus on the quantitative research paradigm, and are trained in more concrete quantitative techniques for data gathering and analysis. This culminates in the third-year research assignment, where students in the role of junior researchers are expected to conduct a small, yet well-defined part of research in their chosen design context.
The design ateliers, the third-year authentic design project, the masters course assignments, and the final masters project provide students with the ultimate opportunity to integrate research and design. For example, in Atelier 2, in line with pragmatic approaches, students are guided through an analysis phase and through three cycles of design and evaluation (screening, expert appraisal, and try-out) while developing a web quest. In Atelier 5, students are expected to hand over an evaluated design. In this respect, the approaches in the ateliers more or less have characteristics of design research (interventionist, iterative, process-oriented, utility-oriented).

The Use Of A Design Model

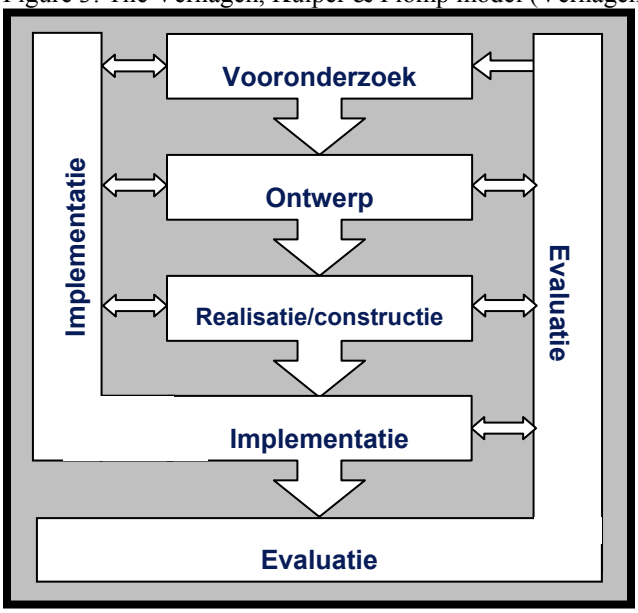
In order to meet all the design principles as elaborated before, we view it as important to use a guiding educational design model that can serve as a 'kapstok'. In the starting years of the program, we relied on a model, formulated by Plomp (1982). A typical approach of this procedural model is that an educational problem - defined as a discrepancy between 'what is' and 'what should be' - is tackled via a five-stage (ADDIE; actually: ADDEI) general procedure for problem-solving by means of a systems approach.

A validation study of this model by Pieters & Bergman (1992) showed that designers thought that the visual representation of this model was too linear and too instrumental in nature, and that it failed to embody other approaches. A remolding of this model was found imperative in order to achieve the following (Verhagen 2000):

- stress the implementation perspective more, exemplified by the motto that implementation starts in the preliminary investigation phase and should be continuously reckoned with throughout the design process;
- accentuate the role and importance of formative and summative evaluation, based on the adage proclaimed throughout the program that there cannot be analysis, design, development, and implementation without evaluation;
- represent all four alternative design paradigms and underlying rationalities distinguished by Visscher-Voerman and Gustafson (2004);
- provide room to typify models and approaches that are domain-specific.

The converted model has been called the Verhagen, Kuiper & Plomp Model and has been pictured in Figure 3.

Figure 3: The Verhagen, Kuiper & Plomp model (Verhagen, 2000).



The Quality Of The Bachelors And The Masters Curriculum

The Envisaged Quality From An Academic Perspective: The External Audit

The quality of a program - in terms of its efficiency and effectiveness - depends on how it is enacted, how it is experienced by students (in terms of learning experiences and outcomes), and how it is perceived by teachers and other stakeholders. Indications about some of these variables are available from three sources: (1) an external audit of both programs (a process that started in 2005 and was completed by the end of 2006), (2) yearly surveys among alumni about how well the alumni are doing in their professional practice and what they consider in retrospect as

strengths and weaknesses of the program(s), and (3) regular course evaluations as part of the internal quality assurance policy. Here and now we confine ourselves highlighting accreditation findings.

The external audit took place within the framework of the overall transition of Dutch university education into a bachelors-masters system. Because of this, all redesigned degree programs have to be externally audited using a standard protocol and then accredited to receive funding from the national government. The protocol covers six topics: objectives of the program; content and structure of the program; deployment of staff, facilities, and provisions; internal quality assurance; and results in terms of the students' success rate and the level and quality of the qualifications achieved by the graduates. These topics are assessed via 21 facets, for each of which criteria have been formulated. The starting point is a self evaluation report, followed by on-site visits by an official Audit Committee where documents are studied and staff, students, and alumni are interviewed in group sessions. Only the qualifications 'pass' or 'fail' exist for the six topics. More distinct judgments are given for the 21 facets, however. Both the bachelors and the masters program got passes for all topics. The Committee was positive about the profile of both programs, which was recognized as clearly design-oriented in the tradition of the international domain of instructional design and technology, and well articulated in the curriculum. The level of the end qualifications of both programs were rated as good. According to the Committee, graduates describe themselves as problem solvers at an academic level. The bachelors program was judged as coherent, with the ateliers as an effective device for fostering interaction between theory and application. The masters program received some criticism, however. In the Committee's opinion the various tracks are so different that they found it hard to see them as viable options for one masters program. That being the case, the Committee judged that the various tracks offer coherent one-year programs in their specific domain that comply with the general design-oriented profile for educating academic problem solvers. Theory development and research being seen as instrumental to design processes is characteristic of this profile at the masters level. The Committee recognized that a proper balance between design and research is strived for. In the bachelors as well as the masters program sufficient attention is paid to academic reflection. It was also noticed that there exist many professional connections (via staff and assignments) with the world of business and industry and with all kinds of institutions and agencies where alumni find jobs (all yielding a clear picture of the labor market), but the goals of both programs have been developed without the systematic involvement of employers of graduates.

The Envisaged Quality From A Professional Perspective: The Alumni Survey

All students (36) who had graduated from the program between 2003 and 2004 have been sent a survey with questions in which alumni are asked to look back at the curriculum from the perspective of their current work situation. The goal was to check whether changes in the outline and content of the curriculum were necessary or regarded to be useful (Slotman & Meijer, 2005).
The response to the questionnaire was 64% (23 persons), meaning that the response group is only partially representative for the target group.
The questionnaire contains questions relating to the following themes:

- general characteristics of alumni
- education
- current work situation
- current job
- review of the curriculum
- alumni association

The results show that 95% of the alumni have found a job two years after finishing their studies, 4 of them as a PhD-student. More than 80 % of the alumni have found a job 6 months after graduation. The level and nature of the job and task description matches the educational domain for which the alumni were educated.

Respondents are satisfied about the preparation of their studies to their current job. They indicated to choose the same studies again as preparation for their current job.

Discussion

Above, we have shared the ins and outs of our educational design program, in which we aim at educating academically qualified problem solvers who are competent to work in a variety of professional settings. In closing, we reflect on five issues that have gotten attention and that will continue to deserve particular attention: the level of academic competence achieved by graduates, the orientation on professional practice, the role of reflection across

the program, the attention to be devoted to the instrumental design approach versus other approaches, and the relationship between design and research.

Level Of Academic Competence Achieved By Graduates

Although the Audit Committee came to the reassuring conclusion that graduates qualify themselves as academic problem solvers and that masters theses are of good quality, the one-year-length of the masters program is a source of concern. Students who enroll the program have different backgrounds, they can be EDMM graduates, graduates from bachelors programs other than EDMM such as professional bachelors who graduated from a Netherlands teacher education institute (with or without working experience) and academic bachelors from abroad (Africa, for instance). It is our experience that many of the enrolling professional bachelors have difficulty in attaining the academic level required within the space of only one year. They simply need more time to master design and research competencies with sufficient academic depth even if they invested in a pre-masters program to qualify for the masters year. This problem of dealing with students with diverse academic skills and attitudes within a short time frame has also been recognized by the Audit Committee. According to the Committee, the best (though probably politically unfeasible) solution to the problem would be to prolong the masters program by one year. Another possibility, in addition to maintaining a strict admission policy, could be to stimulate students to primarily focus on competencies they need to work on in view of the end qualifications to be attained. Such a competence-based approach begins with students' talents, accepting that someone cannot be good at everything. It also entails flexibility in contents, pedagogical approach, and assessment modes. Such a competence-based approach, however, requires a change in teaching practices and, much harder to realize, teachers' beliefs.

Orientation On Professional Practice

The clear focus in the program on professional practices has been exemplified in several authentic learning assignments to be conducted for and in interaction with professional clients. Students highly appreciate and value this (according to regular course evaluations) and the many professional connections they made did not go unnoticed by the Audit Committee. During the assignments, the role models are provided by staff, which consists of primarily academic thinkers and designers. However, what is missing in the program is not only a more systematic involvement of future employers in further developing program goals (see external audit), but also a more prominent role of professional designers in design courses (in addition to the already existing involvement of professional clients and the already existing focus on professional settings). The latter could be realized, for example, by inviting alumni to be guest lecturers, act as role models in design situations, or to provide insight into possible design shortcuts. Thus, they could be an encouragement to students during their development from novice to experienced designer.

Role Of Reflection

A large aspect of the academic attitude is revealed in its considerable emphasis on reflection. Compared to the instructional design competencies for professional designers as formulated by Richey, Fields and Foxon (2001), the component of reflection seems to be more prominent in our curriculum. We regard reflection as an opportunity to not only optimally shape a situation and pre-consider design solutions (Richey, Fields & Foxon, 2001), but to also make designers become aware of their own individual strengths, shortcomings, interests, and basic assumptions. The ability to reflect grants a person lifelong learning and is one of the Dublin descriptors (Joint Quality Initiative, 2004). However, reflection is still too underexposed, especially in the bachelors program even though its importance is acknowledged and its merits are recognized. Students are required to prepare two so called 'reflection papers' (as part of both the first-year introduction course on educational design methodology and the second-year Atelier 3 course) and to elaborate a reflection section on part of the design report on the third-year Atelier 5 design assignment, but the primary focus is on reflection-on-action rather than reflection-in-action (Schön, 1983). In addition, the reflections made are more self-evaluative than reflective. This is possibly due to the fact that it is only in the third year that students are taught and coached on how to reflect. As a solution to this shortcoming, the program has recently decided to pay more attention to the acquisition of reflection-on-action techniques in the first year of the program (from 2007-2008 onwards), and to stimulate the use of reflection-in-action techniques while working on design assignments in the five ateliers.

Instrumental Approach Versus Other Educational Design Approaches

As stated above, we have chosen to use the instrumental approach as the leading pedagogical device. It is our experience that students who already have some design experience are better able to value the various design approaches (instrumental, communicative, pragmatic, and artistic). It is interesting to explore why this could be the case, and how we could incorporate that into our curriculum. One possibility is that these students already have a broader repertoire or a higher level of expertise (as suggested by Jones & Richey, 2000), which enables them to understand and value the different models more quickly and thoroughly. It might also mean that the way we teach the communicative, pragmatic, or artistic approach should be changed or intensified. After all, it is still possible that our current teaching does not connect to the level of expertise of the novice designer (Dorst & Reymen, 2004). In the current program, the four design paradigms and accompanying approaches are introduced through readings and lectures at the very start of the program, and students are supposed to refer to these approaches in their reflections throughout the program. However, it could be more effective to request students to deliberately think or work as a designer from a specific approach (in authentic assignments or in studio assignments, for example) and then ask them to compare their experiences with this approach to experiences with the instrumental approach. Another option could be to introduce design approaches other than the instrumental approach later in the program when students have really mastered the instrumental approach. From a pedagogical point of view, it might then be easier for them to value and interpret the different approaches. Iets meer beschrijven als een interessant onderwerp voor toekomstig onderzoek.

Relationship Between Design And Research

The research courses delivered in the program expose the students to traditional research methods with a relatively large time investment in elements of quantitative research such as quantitative data gathering methods (surveys) and analysis (SPSS). This is motivated by the fact that students consider these subjects rather difficult to master. At the same time, we experience that students have difficulties in recognizing the relevance of the research approaches that are taught to them for design activities. One reason is that research methodology courses and design methodology courses are still more or less separated streams in the curriculum. There is especially room for improvement at the bachelors level as far as the link between research and design methodology is concerned. Improvements to be seriously considered are twofold. First, for students it still should be made more manifest that the research chain of reasoning also reflects academic skills that are vital to educational engineering processes. This idea has been formulated as a redesign principle in the above, but still deserves further attention. Second, more attention is needed in both programs for the concept and methodology of research-based educational engineering (van den Akker & Kuiper, 2007).

In this article, we have shared the ins and outs of our educational design program, in which we aim at preparing students to work as academic or practitioner in the field of educational design and technology. The Audit Committee has provided evidence that the current bachelors and masters programs are of high quality. They are well-balanced, and consistent with the redesign principles. Through the programs, students do indeed develop into academically qualified problem solvers who are competent to work in a variety of professional settings. The critical remarks made in the above final paragraphs are just meant to illustrate that we take our job as designers and teachers of the program very seriously, and are constantly striving for the further improvement of program quality.

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