(new) media in *creative technology*

from a *new media* perspective

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abstract In this note we will discuss the educational targets and learning goals for the *new media* track in *creative technology*. By way of introduction, it will also be explained what must be understood by educational targets, and how we can relate these to the learning goals or topics represented by a collection of courses. A set of courses will be proposed, but also an alternative approach, offering *media in context*, that is as an element of *creative applications* will be discussed, for which we will also indicate the relation to other theories and areas of science.

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introduction

Creating a curriculum for *creative technology*, and for that matter a *new media* track, is, indeed, a complex puzzle, for which potentially many solutions exist. The reader may wonder why also here the sub-title *from a new media perspective* is used. Briefly, this may be explained by stating that, one way or another, *media* may be regarded as an essential ingredient of any ICT-related study, and that, in addition, there are multiple ways of including *media* in the *creative technology* curriculum, even without offering an explicit *new media* track or specialisation.

In other reports[1] we have discussed the relation of *new media* to design, indicated the requirements for computing, sketched scenarios, and (moreover) gave an outline of the *creative technology* curriculum. In each of the reports, an indication of *educational targets*, for each of the various tracks or sub-disciplines, was given, suggesting the relevance of the proposed solution(s).

To give an indication what is meant by the arguably debatable categories of educational targets, a brief explanation is given below:

categories of educational targets

- *skills* – practical, hands-on, technology-oriented
- *knowledge* – ready-to-use, beyond skills, required insight
- *theory* – grounded in literature and scientific research
- *experience* – application of skills and knowledge in context
- *attitude* – personal disposition and motivation

Although there may be no sharp dividing line between for example skills and knowledge, knowledge and theory, and skills and experience, when taking into account the scope within which skills are executed, or the depth or explicitness of theories involved, such a distinction becomes (hopefully) more clear.

Below we will, after clarifying the learning goals and educational targets of the *creative technology* curriculum, give an outline of how the *new media* track could fit within the curriculum, and what choices need to be made to finally realize the curriculum.

creative technology – learning goals and targets

In CreaTe – Proposal for a new curriculum[2] (p. 12), a number of components are mentioned that should be part of such a curriculum. These components include:

learning goals – *creative technology*

- computing – architecture, networks, programming
- technology – new media, smart technology
- creative applications – creativity (mental + artistic), psychology, research/design methods, communication
- business – marketing, planning, project management
- design – sketch, prototype, realize

[1] janus.cs.utwente.nl:8000/twiki/bin/view/CT/NewMedia08

[2] janus.cs.utwente.nl:8000/twiki/pub/CT/WebHome/CreaTeFinalReport_v1.0.pdf

An observation we may make is that for *creative applications* the list of learning goals is rather long and diverse, potentially involving many scientific and possibly extra-academic disciplines, dependent on what level, so to speak, we wish to present these aspects.

In principle, the components listed above can be taken to represent educational targets, that is what students of *creative technology* need to learn or obtain during their study:

educational targets – *creative technology*

- **skill(s)** –*computing, mathematics, simulation, technology*
- **knowledge** –*computer & software architecture, human factors*
- **theory** –*systems engineering, media & communication*
- **experience(s)** –*project(s), deployment in social context*
- **attitude** –*initiative, creative, involved*

Let it be clear, these targets are not a given per se, but could, and probably should be discussed, to obtain a concise description of what we aim for with *creative technology*. An additional (intended) benefit is that this way the requirements for each track in the curriculum can (in principle) be more concisely specified, and compared with the requirements for other tracks.

new media – targets and learning goals

In delineating the content and scope of the *new media* track, or even more plainly the *media* component in the *creative technology* curriculum, we may, with an eye to what is common nowadays for university-level curricula, arrive at the following educational targets:

educational targets – *new media* / ...

- **skill(s)** – scripting, programming, interaction design
- **knowledge** – web, multimedia & game technology
- **theory** – understanding of media & communication
- **experience(s)** – concept development & realization of (playful) application(s)
- **attitude** – explorative, with an eye for the *rethorics of the material*

There is, obviously, ample freedom of what courses or topics to introduce, apart from basic web technology, to realize such targets. Within the *creative technology* curriculum, however, covering a substantial part of the following topics, at least for a *new media* track, seems mandatory.

learning goals – *new media*

- interactive video – in customizable format
- web technology – for developing information portal(s)
- animation – for simulations and (physical) systems
- virtual reality – for games and virtual environments
- game development – for entertainment and instruction
- rich internet application(s) – for multimedia (web) applications
- interactive installation(s) – media art

In the list of topics, each of which could be presented in a course of its own, no explicit indication is given what must be considered pre-requisite knowledge. One option is to include in each course an introductory part in which the basic technology is presented, accompanied with exercises that allow the students to practice and gain experience. This is the way that, for example at art schools, the obstacle of teaching technology is generally dealt with. However, in an academic setting,it seems more worthwhile to profit from other disciplines, such as *computing* and *design*, to obtain the required skills and knowledge of, respectively, scripting/programming and modelling.

new media – course(s)

In specifying the requirements for the computing track in *creative technology* and giving a first proposal for how to organise the first year, admittedly from a *new media* perspective, the following list of courses were proposed, see below. It must be remarked beforehand, however, that the proposal for the first year, which only includes NM1 and NM2, for a total of 9 credits, was to a large extent motivated by feasibility, that is

an equal distribution of courses over the sub-discplines of *creative technology* and, consequently, a delegation of the responsibility to teach *scripting* to *new media*, as part of NM1 (*web technology*). Another, implicit, assumption was that attention to contextual aspects of *new media*, related with creativity, communication and business, was envisaged to take place in *creative application* projects, that must serve an integrative function in the program.

course(s)

course	credits	description
CS1	3	computer & network architecture(s)
CS2	6	programming fundamental(s) – C++/Java
CS3	6	advanced programming – idoms, APIs
NM1	3	web technology (1) – html, javascript. css
NM2	6	animation in 2D
NM3	6	web technology (2) – php, sql, web services
NM4	6	3D virtual environments – x3d/vrml
NM5	6	game development – C++/DirectX
CA1	3	*we create identity*
CA2	6	*living & working tomorrow* (advanced)
CA3	6	*have fun and play!*

As an exmmple CA1 (*we create identity*) planned in the first month, would allow students to create a common website, make interactive videos about topics of interest, and present themselves both as individuals and as a group, thus creating a *common identity*, using open source content management and social networking (web) technology. This way not only the students creativity is stimulated but, albeit in a somewhat implicit way, students also gain hands-on experience (skills) with current-day web technology. In later *creative application* courses, CA2 and CA3, other tracks, in particular *smart technology* and *design* could play a more prominent role.

As argued in the computing requirements report, it is likely that we wish to offer our students, next to scripting, in-depth skills and knowledge of programming, preferably in C++, which also seems required for the *smart technology* track, and may also be considered a pre-requisite for (serious) game development with more advanced technologies. As a remark, dividing the tasks of teaching basic skills and programming is beyond the scope of this note, even though it will ultimately determine in what form media technologies will be presented.

media in context – creative application(s)

It seems worthwhile to present a scenario of teaching media-related skills and knowledge (and even some theory) not in a topic-oriented way as indicated above, but embedded in a *creative application* project. The type of application could range from, say, a cultural heritage application [1], a social awareness system which by its definition would include smart technology [2], or a (more or less *serious*) game on a suitable rich media platform [3].

Irrespective of the type of application or the societal topic(s) addressed by the product, such a course/prpject would address the following learning goals:

learning goal(s)

- elementary web-based multimedia technology
- programming and tools for interactive animation and video
- first principles of information visualisation
- basic media and cummunication theory
- the design of an effective communication plan
- the business and societal context of media deployment

The advantage of such an approach, in which media technology is presented in the context of a *creative application* (of societal relevance), over a disciplinary approach to teaching *new media*, is that skills and knowledge are learned as a group, which allows students to tackle issues according to their interest, expertise and (individual) talent. The disadvantage, in return, is that it becomes more difficult to assess the contribution as well as the level of skill and knowledge of the individual student(s).

Very likely, for a first year, a middle-way approach is most desirable, where students work individually or in small groups in disciplinary courses for the various tracks, but are encouraged to work in large groups on integrative *creative application* projects, which allows them to develop a more personal profile according to individual preference(s).

An example structure of such an integrative project, with a *new media* flavor, indeed, is given below:

course structure

- week 1 – introduction of platform and design issues [2]
- week 1 – concept design of (media) application(s) [6]
- week 2 – essentials of animation and visualisation [6]
- week 2 – basic media and communication theory [4]
- week 3 – information presentation in (flex RIA) platform
- week 3 – student presentations of design and storyboards
- week 4 – business and societal context of the creative industry [5]
- week 4 – delivery and presentation of final application(s)

Not included in this outline, are checkpoints for tutor and peer review, which are essental instruments for feedback and progress control. Also, in my experience, it is worthwhile to create an element of (external) visibility, for example by involving an (external) commercial or institutional partner, which acts as *opdrachtgever*.

As for issues of theory and technology, it must be mentioned that such projects may form an excellent starting point for literature study or technical exploration, since they do provide the motivation needed for more in-depth studies, that may otherwise be hard to achieve.

conclusion(s)

In this brief report we have given an outline of the disciplinary courses needed for a *new media* track in *creative technology*. Also we have sketched a partially alternative scenario which allows for teaching *media* skills and knowledge in the context of a *creative application* project, where the goals is determined by content and (societal) relevance, yet the means require sufficient yechnical expertise, that must be acquired on the way.

In summary, however, it seems best to include a sufficient amount of disciplinary (*new media*) courses, where students can explore their technical skills and creative talent in a more independent and individual way. From a *new media* perspective, I am tempted to say, such courses form an essential preparation for more demanding projects, where apart from technical skills and knowledge, also interpersonal communication and group behavior play a role. Nevertheless, as integrative units, *creative application* projects must be considered essential in the *creative technology* curriculum, to prepare students for one of the possible roles in the *creative industry*, *product design*, *communication*, *entertainment*, or (serious) *game development*.

reference(s)

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