Informatics and Media production

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Abstract

This thesis investigates whether the discipline Informatics is suitable as the main subject for courses and programs that teach media production and related subjects. To analyze the two fields, Grounded Theory is used in order to achieve an overview of the two fields. The result of the study is that while informatics can provide a framework for media production to work within, it's not a perfect match.

Key words: Informatics, media production, information systems, education

1 Introduction

1.1 Background

The general area of digital media production is an emerging discipline within academia. Even within the professional field it's a young discipline. Pioneering work was done by George Lucas, who had some digital tools in his pipeline in the middle of the 80's (Prince, 2004)
Films like O' Brother, Where Art Thou and Welcome to Pleasantville were among the first feature length movies to be produced with digital tools as a major part of the production chain. These two movies where produced in the late 1990's, which at the time of writing of this report is less than two decades ago (Prince, 2004).
Finally, the first feature length 3d-movie, Toy Story, premiered 1995, and Pixar was founded a little more than a decade before that.

All these examples demonstrate that the discipline surrounding digital media production is a fairly young one, even compared to other computer based sciences. For instance, the programming language of C was developed in the late 60's and early 70's.

Even 3d-graphics as a discipline outdates the generic field of digital media production, with roots going back to the late 50's. (Comninos et al., 2009)

1.2 New academic subjects

Since digital media production is a young discipline overall, it's also a new domain within academia. When new domains emerge, there is often an initial ambiguity regarding which discipline it should belong to. For instance, the area of computer sciences grew first from mathematics, and later it fell under the domain of electronics and electronic engineering. (Dahlbom, 1996)

Same thing can be seen with the subject of Informatics, that started out in a number of different areas (computer sciences, cognitive sciences etc) and then converged into the subject we now know as Informatics(Dahlbom, 1996).

A similar process can be seen in the development of Media Production and related subjects. For instance, in the UK, the subject was studied in computer science, engineering and art schools. There was also varying ways to look at the subject, depending on which discipline it fell under. It was first in 1989 that the first masters program that combined technological skills and artistic skills was developed and launched. (Comninos et al., 2009)

Even then, it was met by some scepticism, especially from the art field. (Comninos et al., 2009). In some ways, it seems this is based on the two major parts of the field of media production, art and technology, and their inherent differences. This is also discribed by McCraken (2006) who points out that succesful students in the computer graphics field are the ones that manage to combine those two fields, but also points out that there is a tendency for various schools to focus to much on one of these two areas (McCracken, 2006)

The development of a new field also takes time, and is something that grows organically. This is a process that is described by Fagerberg and Verspagen (Fagerberg & Verspagen, 2009)
, Molke et al(Molke et al., 2004) and Berry et al(Berry & Parasuraman, 1993) who describes the growth of Innovation Studies, Occupational Science and Service Marketing, respectively. They all present similar stories with subjects that grow over time, first studied under other disciplines, but then growing into areas of themselves. It's not uncommon to for this new area to be challenged by other, existing disciplines how (rightly or falsely) feel threatened by this new discipline. More multidisciplinary disciplines also face the challenge of deciding where to belong, and can grow from multiple subjects. (Dahlbom, 1996), (Laxer & Orr, 2006), (Comninos et al., 2009).

1.3 Problem area and purpose of study

1.3.1 The merging of two subjects

At University West, there are two bachelor programs related to media production in various ways (Digital Media and 3d Visualization and Animation). Both of these lead to a bachelors degree in Informatics. This choice has influenced both programs, and in some cases there has been a conflict between the formal subject (Informatics) and the skills and abilities that was expected by the students and future employers. This is more apparent in the more technical areas of media production (in the Digital Media program) and in the 3d-visualization program.

Informatics, at it's core, is a social science with a focus on the usage of information systems in society and organizations. Although it has changed and evolved over the years, the discipline as such hasn't had the main intention to support the processes of designing and producing media productions.

This relationship, between the discipline Informatics and the general area of media production, is the focus of this thesis.

1.3.2 Research question

This report is a primary study on how well the domain of Media Production maps to information system sciences as they are described by swedish universities.

Is the theoretical framework found in the Informatics discipline applicable to the the domain of Media production, so that Media Production can be considered be a part of Informatics?

To properly answer this question, the following points will be evaluated:

What are the key objectives and challenges in media production education, as posed by swedish universities?

and

Does informatics as an academic discipline provide a framework that fulfills those objectives?

1.4 Summary of thesis

1.4.1 Method

This is a qualitative study where the disciplines of Informatics and the domain of media production are compared to evaluate the relationship between the two.

The study is conducted through the use of Grounded Theory, and the data used is collected from curricula and descriptions of Informatics and media production from swedish universities. (Pandit, 1996)

1.4.2 Previous works

A number of earlier works are used to provide a context and a foundation for the different concepts in this study. One core text is the New Informatics by Bo Dahlbom (Dahlbom, 1996), which provides a framework for the discipline Informatics.

In the late 1980's and early 1990's, UK launced its first masters and bachelors programs for computer graphics, and this case is used to provide a framework on how to think about media production. (Comninos et al., 2009)

Another important contributer is the SIGGRAPH Curriculum Working Group. This group was formed with the purpose of developing the educational field of computer graphics, and between the years 2002 and 2006 they formulated 17 core concepts found necessary for a successful education in computer graphics. (Laxer & Orr, 2006)

1.4.3 Content Analysis

With the purpose of getting an overview of the subject, a content analysis is performed on both the collected descriptions of Informatics, and the curricula of media production classes.

The website for Swedish National Agency for Higher Education provides a complete list of all Swedish universities. (n.d.). Using that, all universities that provide courses in Informatics was found, and their descriptions of the subject Informatics as well as their various curricula were downloaded.

The same thing was then done with courses and programs that was considered to be related to the area of media production. The guiding principle was to see if any given course or program had the process of designing and producing still and moving images and/or sound as part of the curriculum. Courses and programs that were artistic rather than scientific was also excluded since they operate under slightly different circumstances.

All curricula and descriptions were then gathered together and read through. All important keywords (including course objectives) were extracted and put in a spreadsheet for better overview. This process was done for both the Informatics courses and the courses related to Media Production.

Using a special software, these keywords were then grouped together in larger categories. The objective of this procedure was to find a larger structure of how the two subjects were described and defined by the academic collective.

1.4.4 Interviews

Two interviews where conducted with professionals in the field. Both interviewees work in a context where media production is taught under the discipline of Informatics. The interviews where open ended, and the purpose of the interviews was to get an insight into their reasoning on how they look at the combination of the two subjects on a professional level.

The first interviewee is a teacher that works with courses that uses Informatics as it's Main Area, and Media Production as it's subject group. The second interviewee is program manager for the Digital Media program, which has a strong track in media production and leads to a bachelors degree in Informatics.

The result of the interviews is presented through categories that evolved during the interview.

1.4.5 Result

The aim of this study was to get map the subjects of Informatics and Media Production and analyze how applicable Informatics is as a foundation for Media Production. The study was initiated by the issues raised by placing media production classes under the main area of Informatics.

The study showed that media production as a discipline is still a young discipline. It also shows that some aspects of Informatics can be applied to media production. Examples of this is the design methodology and using principles from Informatics to build a production pipeline.

There are, however, some areas where Informatics fall short. The main area is the discussion about aesthetic and artistic qualities, and how to evaluate these. In this area, the discipline of Informatics doesn't provide a suitable framework.

Finally, while there are some areas where Informatics can be applied, those areas aren't unique for Informatics. Rather there are other disciplines that provides these tools as well.

The conclusion is that Informatics can be used as the framework to put media production in, but it isn't a perfect match.

2 Theoretical Background

2.1 Information Systems

2.1.1 Terminology

In this thesis, the term ”Informatics” is used as a translation for the swedish word ”Informatik”. However, as Dahlbom writes, that term isn’t without it’s problems. In countries outside of Sweden, ”Informatics” is used to describe Computer Sciences in general, whereas in Sweden it’s a more specific discipline. (Dahlbom, 1996)

Sometimes the earlier term (Information Systems) is still used, and sometimes the the clarifying term ”social informatics” is used to distinguish the Swedish use of informatics from the more commonly used definition. (Dahlbom, 1996)

2.1.2 History of Information Systems

Broadly speaking, the domain of Informatics focuses on the use of technology in organizations, businesses and governmental bodies. The background of informatics provides both an understanding of the domain in itself, and it also provides an example of how a discipline grows and changes as it matures.

In Bo Dahlboms article (1996) on the growth and emergance of Informatics in Scandinavia, he talks about stages of computer use.

While computers and the predecessors of computers have a longer history than that, Dahlbom starts in the 1950’s and describes the early computers and what is required to use them. The computers where big calculating machines used to make large and complex calculations. The skills needed to use them where mostly in the field of mathematics, like numerical analysis. The use of these machines were mostly military, and provided data for ballistic calculations and similar.

In the 1960’s the use of computers expanded into the administrative domain. Instead of just doing calculations, computers where used as Informatics, keeping track of large amounts of data. They where used to keep track of people, products, economical transactions etc. At the same time, computers started to be used to control and manage processes, like in the production industry.

During the 1970’s computers became more and more used on an individual level (although still in the office) through tools like word processors and spreadsheets. As the use of computers spread, so did the interest in designing computers so that they were easier to

use. Thus the interface got more attention, and the foundation of the modern computer graphical interface saw the light of day, including inventions like the computer mouse.

Slowly, a personalization process started, and Dahlbom attributes it to the growing use in the office. For instance, people used it for economic calculations in the office, and saw that they could use the same tool for keeping track of their own, private economy, use it to write letters, make homework etc. Parallel with this, the interest in Human Computer interaction grew, and became the domain for designers and cognitivists, rather than technicians.

When the computer reached our homes, the use of them changed. Instead of just being a "home office"-tool, it's use widened to entertainment, media and communication. Instead of being computing machines or Informatics, the concept of personal computing was introduced.

While network communication had existed before, in the 90's the use of Internet became more widespread, and in combination with the trends that started in the 80's the term Information Technology emerged. Computers are no longer used as standalone tools, but are instead part of a wider network.

2.1.3 The Nature of Information systems

If, as Dahlbom says, this discipline is about the use of information systems and that the use of information systems has changed, or rather grown, over the years, then it follows that the discipline has both changed and grown over the years as well. As the area studied has changed, the discipline in itself has changed as well, slowly incorporating new areas as they were needed. While more the more advanced mathematical and programming questions are left in their respective field, many of the other subjects dealt with over the years remain within the domain of Informatics.

Examples of this includes, but is not limited to, scripting, user interface design, the effect of introducing IT-systems in an organization and process management.

As the content of the domain has changed, so has the name. In Sweden, the name has change from Administrative data processing (Administrativ Databehandling, ADB), System sciences to Informatics (Informatik).

2.2 Media production

2.2.1 Digital Media Production

For this report, the domain of digital media production entails activities and theories surrounding the realization and visualization of an idea or a story with sound, still images

and video. Areas that fall under this is digital image processing, digital audio processing, digital color correction, digital video editing, postproduction and special effects using digital tools and 3d-graphics (although not CAD-based 3d-graphics).

While the pure artistic and creative disciplines, like script-wrting or drawing, are excluded from this area for the purpose of this report, others, like montage, picture composition, and similar will be included.

Also included is the understanding of the process of digital media production, it's business effects and it's place in society, as long as those areas are isolated from the more technical aspects of the discipline. Overall, the area includes both technical, social, esthetical and economical aspects of the production of sound, still images and video (including 3d-graphics).

Just as Informatics started out, not as a single discipline, but got where it is today through various disciplines, the discipline media production still can be found in a variety of places. (Wong et al., 2004). For instance, courses that call themselves media or digital media-classes can be found in Computer Science, Commuications or Art and Design faculties. In addition to that, many schools place this domain under an independent header. (Wong et al., 2004)

2.2.2 Earlier works

There's a number of earlier works that look at the challenges of arranging a successful education within the field of Media Production or related fields. Media Production is an area that is categorized in a number of ways, and taught under a number of different subjects, as presented by Wong (Wong et al., 2004)

While there are articles that document the work with developing Curriculums and education programs within the larger field of media production, the wide variety of ways to interpret the subject makes direct comparisons difficult. Instead of media production, sometimes terms like computer graphics or computer animation is used. These areas differ slightly from media production in that they put are less interested in the act of media capture (that is, recording sound and images). That doesn't mean, however, that they ignore it altogether.

Pioneering work

During the 1980's there was a growing industry in computer graphics and 3d-animation in the UK. However, there was no applicable university level education to provide this new industry with skilled workers. (Comninos et al., 2009)

As a reaction to this, the National Centre for Computer Animation (NCCA) was founded in 1989. Before this, education aimed at Computer Graphics was almost exclusively done at Computer Science or engineering schools. (Comninos et al., 2009)

The core idea that NCCA worked from, and this was developed from long experience of those involved in the project combined with analyzing industry needs, was to produce graduates that were a hybrid technologist and artist. This idea was met by sceptic views from other academies throughout the UK. However, as the Comninos et al (2009) points out, this wasn't the first time that a field used multiple disciplines in this way. One well established field is the field of Architecture, which combines both artistic ability and technical skills. An architect needs to design buildings that are both aesthetically pleasing and structurally sound. (Comninos et al., 2009)

In 1990 the first Masters program in Computer Animation was launched, and it was one of the first in the world to combine a mix of 50% art and 50% science. (Comninos et al., 2009)

Two years later, in 1992, a similar Bachelors degree was launched, working under the same principles as the masters program.

Art and Science

While the NCCA was among the first to look at computer graphics as a multi-disciplinary subject, that way to look at the field is used by others as well.

In an article that looks at why many animation graduates have difficulties getting a job after going through an education, McCracken focuses on the importance of being multi-talented. One of the key words used is Problem Solving, and that requires a solid knowledge about both artistic principles and technical issues and the inner workings of the tools. (McCracken, 2006)

2.2.3 SIGGRAPH Curriculum working group

In 2001 there was a discussion forum at the 2001 SIGGRAPH Conference Educators Program called "The Emerging Computer Graphics Discipline". (Laxer & Orr, 2006). It was led by Gary Bertoline of Purdue University and in the talks he put forward that computer graphics should be considered a "renaissance discipline, on a continuum between art and computer science". (Laxer & Orr, 2006)

That forum and the following discussions started was the spawning point for the SIGGRAPH Curriculum working group. Their purpose was to find core topics that should form the basis for a computer graphics students education and that formed this

”multidisciplinary nature”. Early, two main tracks were identified, one for the more artistically inclined and one for the more technically inclined.

2006 the work had progressed and a set of core topics were defined. They had been formulated with input from both representatives of academia, and representatives from the computer graphics industry. This resulted in 17 core subjects, and in this report it’s considered good if students at least touch upon all these subjects.

These core subjects are presented in the list below:

Fundamentals
Professional Issues
Physical Sciences
Math
Perception and Cognition
Human-Computer Interactions
Programming and Scripting
Animation
Rendering
Modelling
Graphics Hardware
Digital Images
Communications
Cultural Perspectives
Art and Design foundations
Real-Time Graphics
Advanced Topics

The purpose of the SIGGRAPH Curriculum working group is more related directly to computer graphics, and less to digital media production as a whole. In this way it’s not fully applicable to the discipline of media production. It is, however, an interesting starting point. What is lacking is mostly the capture of sound and images, and media production avoids the issue of the more advanced maths and programming issues.

Two points that are reinforced by this, however, is that it is a very young subject and that’s it’s a multidisciplinary subject that stretches over a wide range of areas.

3 Method

3.1 Overview of the method

This study is based on a Grounded Theory method. The idea behind grounded theory is to collect raw data, and then categorize that data in more abstract catgories. (Strauss & Corbin, 1997; Pandit, 1996)

In this study, the data is obtained from curricula and descriptions of the discipline informatics and media production related courses and programs. In addition to this, interviews will be made with professionals in the field, and the study will be supported by a litterature study of previous works.

The use of multiple types of data sources is supported and encouraged by Grounded Theory, because it gives a more ”synergistic view of evidence” (Strauss & Corbin, 1997; Pandit, 1996)

In this study caution had to be taken about getting a solid understanding of the categories and key words found. There are three risks in this study. First, there will be a comparison between two different disciplines, and while they can use the same words, there is no guarantee that the assign the same meaning to words. Second, in some cases words that have a very specific meaning in some disciplines, while other disciplines uses the words everyday meaning. One example of this is the area of words like aesthetics and art, which have a very clearly defined meaning in their own domain, whereas professionals in other disciplines uses these words in a more generic meaning, like ”visually pleasing”.

The purpose of this dual study is then to compare the two models to evaluate whether informatics discipline is applicable as a framework and discipline for media production.

3.2 Content analysis of Curriculums

This study is a qualitative study that aims to analyze how the discipline of Informatics is described and defined by a number of curriculums and descriptions from universities in Sweden. A Grounded Theory-method will be used to systematically build a framework of concepts that can help define both disciplines.

Grounded Theory is described by Corbin and Straus (1998), and they present a framework and a method for collecting and analyzing raw data and from that data find abstract categories. (Strauss & Corbin, 1998)

They propose a nine-step method, and these steps are grouped into five phases

- Research Design Phase
  - Review of technical litterature
  - Selecting Cases
- Data Collection Phase
  - Develop rigorous data collection protocol
  - Entering the field
- Data Ordering Phase
  - Data Ordering
- Data Analysis Phase
  - Analyzing data relating to the first case
  - Theoretical sampling
  - Reaching Closure
- Litterature Comparison Phase
  - Compare emergent theory with extant litterature

(Strauss & Corbin, 1998)

These steps are the ones presented by Strauss and Corbin. However, Grounded Theory is not a single, unified method, but there are rather a number of different interpretations of it (Goulding, 1999), and there is also some inherent flexibility to the method (Jones & Alony, 2011).

In the following sections, the different phases are described as they were used in this particular study.

3.2.1 Research Design Phase

The first phase defines the area being researched and creates a focus for the study. In this study, the professional experience from the author and a basic orientation of the two subjects were used.

The data sources for this study will be curricula and descriptions from all Swedish universities teaching informatics or courses related to media production, literature describing previous works and open interviews.

The criteria for selecting curricula and descriptions for informatics was that all schools that taught informatics was included.

In the case of media production, the selection process was made harder by the lack of a common descriptor. The guiding principle was to see if any given course or program had the process of designing and producing still and moving images and/or sound as part of the

curriculum. Courses and programs that were artistic rather than scientific was also excluded since they operate under slightly different circumstances.

In addition to the analysis of how the subjects are described, interviews have been made with two lecturers that are active in both the fields of Informatics and media production. The interviews were open-ended and the aim of them was to get an insight into how courses in media production can work on a more practical level, for the first interview, and to get reflections on how to design an education program that is gives an exam in Informatics, but is focused heavily into media production and similar fields.

Including both the curricula from universities and the interviews ensures that the issue is studied from different angles, and provides a more synergetic, complete image. (Strauss & Corbin, 1998)

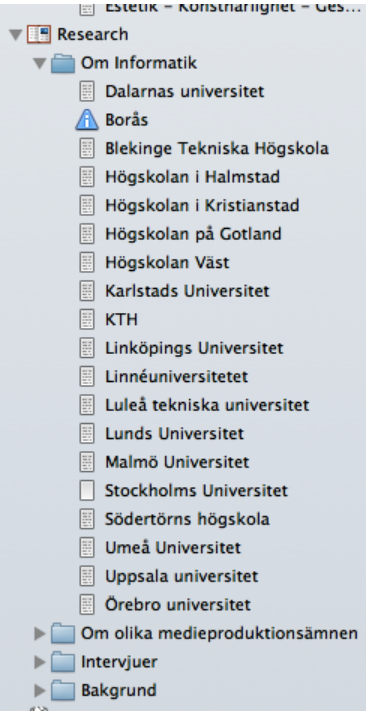
3.2.2 Data Collection Phase

The content analysis began with data collection. The Swedish National Agency for Higher Education provides a complete list over Swedish universities. Using this list, the website of all universities were visited, and curricula and information about first Informatics and then media production was collected.

When PDF's of curricula was available, these were downloaded. All this information was stored offline, using the tool Scrivener. For each school, courses and programs were studied. Relevant texts was copied in it's entirety into Scrivener, sorted under each university. For each university, program or course, the URL-adress linking directly to the original site was provided, making it easier to go back to the source.

In the case of informatics, the selection process was simple, and the selection criteria was that the university taught informatics and/or had an informatics department. The figure on

this page shows what the structure looks like within the program.



The interviews where about 30 minutes (the first interview) and 60 minutes (the second interview). In both cases the interviews where recorded and later transcribed.

Mostly, the interviewees where allowed to talk freely, and it was more important to get their personal insight and outlook in things than to get answers to specific questions.

3.2.3 Data Ordering Phase

The purpose of this phase is to organize the collected data. This serves two purposes. First, having well organized data makes the analysis of the data easier. Second, if it's organized in a chronological order, it's also easier to examine the process of the data collection. (Strauss & Corbin, 1997)

In this study, the two different kinds of data collections also resulted in two ways to organize the data. One for the study of curricula and one for the interviews.

Entered keywords in spreadsheet,

Strauss et al proposes that the data should be organized chronologically (Strauss & Corbin, 1997). However, as time isn't a relevant factor in this study, the choice was made to organize the data according to respective university instead. The main reason for doing this was that it makes it easier to go back to the source, i.e the relevant school, for validating a certain data.

The spreadsheet was organized so that each column was a different university, and then all relevant keywords, sentences and course objectives were listed under the university. In the case of media production, the different subject groups or main areas were listed as well.

Interviews

The interviews were recorded as a digital file and then transcribed using a software tool called InterviewTranscriber. This tool divides the sound file in phrases, and these phrases can then be sorted chronologically or based on speaker. Each phase is connected to the sound file, so by clicking on a written phrase it's possible to jump directly to that place in the sound file, thus facilitating the validation of what was written and said.

3.2.4 Data Analysis phase

The Data Analysis phase is the phase where the collected data is interpreted and analyzed. The aim of the process is to group all the keywords and passages obtained in the previous phase in categories and sub-categories, and also to find relationships between these categories (Jones & Alony, 2011).

This process uses three different types of coding, Open Coding, Axial Coding and Selective Coding (Pandit, 1996), and together these help build a theoretical framework for the area being studied.

It should be noted, however, that these three often work in conjunction and in an iterative process, rather than sequential (Pandit, 1996).

The use of memo-notes is often recommended (Goulding, 1999; Pandit, 1996; Strauss & Corbin, 1997), in order to facilitate moving key-words and categories around as the model develops. In this study, a software tool called Scapple will be used for this instead.

Since this study is comparing two different disciplines, two separate workspaces were created. One for informatics, and one for media production.

Open Coding

The process of open coding is where units of data, like key-words or sentences, are grouped together in more generic categories (Goulding, 1999; Pandit, 1996). In this study it meant looking at a key-word or a course objective (from hereon called unit of data), and then copying it from the spreadsheet (described above) into the Scapple workspace. Each unit of data from a single university was pasted into the workspace, and similar units were placed in close proximity to each other.

Units of data that didn't seem to belong to anything else was still pasted into the workspace, but at a place of their own.

As the process continued, groups of data emerged, thus forming different categories. In some instances the category was clear and even explicit, but in some cases it was possible to see groupings of data that clearly belonged together, but didn't reveal a clear category until later in the process. One example of this was the category "Material", which is a collective name for all components included in a media production (still and moving images, animations, sounds etc).

Axial Coding

While the process of Open Coding gives different categories, it doesn't say anything about the relationships between these categories. This is done in the Axial Coding process. Here, the categories are given relationships to each other, forming categories and sub-categories (Pandit, 1996).

Selective Coding

As more and more units of data are added to the workspace, the different categories and their relationships becomes stronger and more saturated. Saturation in this case means that new data conforms to and confirms the already existing categories (Jones & Alony, 2011). As the saturation decreases, the need to add all data from a particular source (interview, litterature study etc) goes down. Instead, only data that adds something new to the model is amended to the workspace, the rest are ignored (Jones & Alony, 2011). This process of selective adding of new data is called Selective Coding

Data in this study was added to the workspace on a university-by-university basis.

For the workspace that focused on media production, selective coding went up after about 2/3 of the universities, and the amount of new data added was decreased significantly. Almost no new data at all was added from the last two universities.

This was even more significant in the study of informatics, where the workspace became saturated at an earlier stage, even though the number of universities were lower. One explanation for that could be that informatics is a more well-defined discipline than media production.

Theoretical Coding

While both open coding, axial coding and selective coding is about building categories, Theoretical Coding is about studying these categories and sub-categories to find causal relationships between them (Jones & Alony, 2011).

In this study, the condition that the relationships should be causal poses a problem, since the study doesn't set out to construct a cause-and-effect theory. Neither does the subject matter in itself contain causal relationships.

It can still be argued, however, that this method is valid and applicable. While there are no causal relationships in the curricula themselves, they do explicitly and implicitly express causal and other relationships when describing the disciplines.

In other words it can be said that this study cannot reveal any causal relationships between two categories, but it can reveal that the universities describe the two categories as having a causal relationship.

Iterative process

As mentioned above, the different coding phases (open, axial, selective and theoretical) shouldn't be considered sequential phases following a waterfall model. Instead they are iterative, and are applied continuously as more and more data is added (Pandit, 1996)

In this study, it became an iterative process where more data was added to the workspace and formed into categories. After a number of schools, two things happened. First, a couple of clear categories emerged, and second, the workspace became very cluttered.

Using open coding, data units that were clearly similar was removed from the workspace, and replaced by a single category. Each iteration in this process was the adding of a new university. All units of data that clearly belonged to an already existing generic category was omitted, and only new data was added. After a while, new, clear categories became apparent, and the individual data units replaced with a single category and so on.

3.2.5 Litterature Comparison Phase

The final step of this method is the Litterature Comparison phase. During this phase, the model built in the Data Analysis phase is compared to existing literature and earlier studies (Pandit, 1996; Strauss & Corbin, 1997).

To some extent, the interviews performed will also be used to gain an increased understanding of the model.

3.2.6 Final comparison

When the two disciplines are studied for themselves, the resulting analysis will be used to find an answer to the secondary questions regarding the objectives/ challenges given by

media production, and whether informatics can provide an answer to those questions. These answers will then be used to try to evaluate the main question of the thesis.

4 Result and Analysis

4.1 Classification of media production classes

The classification of the media production discipline isn't unified. Instead a number of different subjects are used. Some use already existing and widely used terms, like media production, computer science or Informatics, while others define their own classifications, like audiovisual studies.

This table shows the different subjects used, both in Swedish and the English translation. The latter uses the translation the schools themselves use.

Audiovisuell Produktion	Audiovisual production
Audiovisuella studier	Audiovisual studies
Bildproduktion	Moving image production
Datateknik	Computer engineering
Datavetenskap	Computer Science
Digital Visualisering	Digital visualisation
Fri Konst	Free arts
Gestaltning i Konvergerande Medier	Expression in convergent media
Grafisk Design	Graphical Design
Informatik	Informatics
Informationsdesign	Information Design
Kultur- och mediegestaltning	Culture and Media Production
Ljud och musikproduktion	Sound- and music production
Medie och kommunikationsvetenskap	Media studies
Mediedesign	Media design
Medieproduktion	Media production
Medieteknik	Media engineering
Visuell kommunikation	Visual communication

There are today 21 universities in Sweden with one or more classes that is related to digital media production as described in this paper. Out of these, at least four of them has a relationship between the subject of Informatics and digital media production.

4.2 Categories and their relationships

4.2.1 Media production

Categories

This is a summary of the categories that were found when structuring the objectives and contents of the different curricula. On the following page is a summary of the structure of keywords

Technology

A large amount of schools use the Swedish word ”teknik”, and stresses the importance of this. There is some ambiguity in this, since ”teknik” can mean both technology and technological tools, as well as technique (as methodology and how well someone is performing something). However, looking at the context in which the word is normally used in the description, it seems as it’s the former that is the main use of the word.

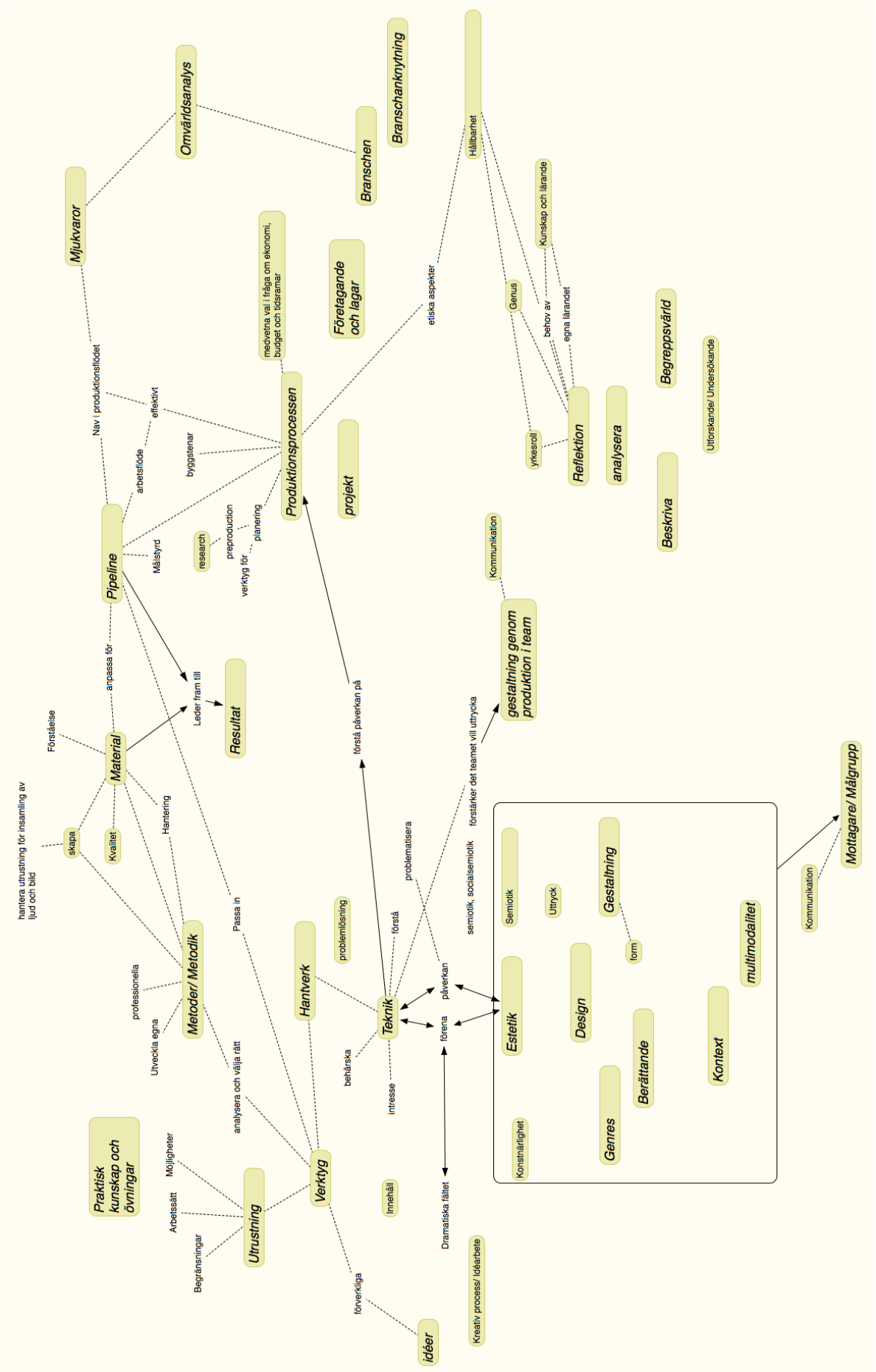
There are a number of other contexts/words connected to this keyword. While there is some connection to practical work, it’s also said that the producer/user should master the technology and also attain a deeper understanding of it. There are also a couple of mentions that technical solutions should be sought out and that the technology should be challenged and pushed

Some schools look at natural sciences and, for instance, want to give the students a basic understanding on how sound and acoustics work.

Closely related to this is the tools of the trade, and many of the statements hint at this. For instance, the tools and the technology used in a particular case should be chosen consciously depending on the context.

As said above, the meaning ”technology” is the main use of the word, but there are some cases where ”method” is a better chosen word. For instance, in 3d-modelling and animation-classes, the methods for 3d-modelling and animation are a part of the curriculum.

While the concept of technology and the understanding thereof is one of the absolutely most common concepts mentioned in the various curriculums very little is mentioned about what it actually means.


Mjukvaror
Omvärldsanalys
Branschen
Branschanknytning
Företagande och lagar
projekt
Produktionsprocessen
Pipeline
Material
Resultat
Leder fram till
anpassa för
Förståelse
skapa
Kvalitet
Hantering
hantera utrustning för insamling av ljud och bild
Nav i produktionsflödet
effektivt
arbetsflöde
byggstenar
Målstyrd
research
preproduction
planering
verktyg för
medvetna val i fråga om ekonomi, budget och tidsramar
etiska aspekter
Hållbarhet
Genus
yrkesroll
behov av
Kunskap och lärande
egna lärandet
Reflektion
analysera
Beskriva
Begreppsvärld
Utforskande/ Undersökande
Kommunikation
gestaltning genom produktion i team
förstärker det teamet vill uttrycka
förstå påverkan på
Hantverk
problemlösning
Teknik
förstå
problematisera
semiotik, socialsemiotik
påverkan
förena
Metoder/ Metodik
professionella
Utveckla egna
Passa in
analysera och välja rätt
behärska
intresse
Verktyg
Utrustning
Möjligheter
Arbetssätt
Begränsningar
Praktisk kunskap och övningar
förverkliga
idéer
Innehåll
Dramatiska fältet
Kreativ process/ Idéarbete
Estetik
Semiotik
Uttryck
Konstnärlighet
Design
Gestaltning
form
Genres
Berättande
Kontext
multimodalitet
Kommunikation
Mottagare/ Målgrupp

However, it's often mentioned that the students should display skills and affinity for finding technical solutions. This implies that technology is more than just simple knowledge on how to do things, there seems to be a deeper understanding of the principles behind as well. Many schools do also mention the theoretical foundations of technology, which further supports this position

Working as a team

One central keyword is the importance of working in a team. There is a separate keyword that focuses on the actual practical process in the production, but this area is more aimed at the social, organizational aspects of working in a team. Much of it focuses on communication, like the ability to communicate ideas within a team, and to create productive interactions between the team members.

What should be communicated is the vision/idea and the solution for how to get there. Not only from an informative point of view, but also from a motivational.

Reflection, evaluation and self awareness

The ability to evaluate, reflect upon and analyze is also mentioned in a number of places. Furthermore, there are a couple of distinct areas that are mentioned here.

- The overall quality of a product (both technical and aesthetical)
- One-self as a professional and as a leader
- The individual learning process and the need for additional, new knowledge and skills
- Ethical issues
- Theoretical questions

Some of these are more related to the learning process, and some more related to the actual working situation. With that said, in none of the schools so far is it explicitly stated that learning ends after graduation, instead they work for a learning process that extends well into the working life.

On another direction, there is a separation between internal reflection and external reflection. The former is about knowing your self, your skills and your role, while the latter is more evaluating a specific work or product, for instance.

Communication and recepient

Communication is seen as an integral skill in media production. There are two major aspects of this, internal and external. Internal communication is communication within the

team, or with other professionals. It can be conveying an idea or a vision, or presenting a workflow so that everyone understands it.

External communication is the ability to use media channels to convey a message and to understand the recipient of a media production. The first part of this, to convey a message, requires an understanding of the possibilities of media productions, and the ability to design it so that it has the ability to capture and hold the interest of the recepient and the target group.

In order to do that, you also need a knowledge of the target group, knowing what their interests are and how to speak to them.

Easthetics and design

When it comes to the content and the look of the final product, there are a number of different terms used. While they can seem similar on the surface, there are some things that should be taken into consideration.

In this area it's also important to remember that, while these terms are defined in their respective areas, their everyday use doesn't necessarily correspond to that definition, and therefore it's important to be cautious when trying to draw conclusions from the words used.

The two most common words are aesthetics and design. The final product should be aesthetically pleasing, and the students should have the ability to evaluate and analyze media productions from an aesthetic point of view.

There also seems to be a connection between aesthetics and technology. It is said that the student and media producer should unite digital technology and creativity.

Design is a related concept, and the student should have knowledge about different kinds of design (information design, graphical design etc), and this seems to be related to, among other things, composition and layout. It can also mean things like the look and style of a movie.

Both design and aesthetics have some fundamental rules and methods to them, which makes them a bit different from the third, which is artistic ability. In some circumstances that is related to the word craft, the artist and the craftsman are not far apart. However, there is also the kind of art that is a special branch in academia, or rather separated from academia, with its' own rules and frameworks.

Production and media producer

The concept of a digital media production, and digital media producer, is a core concept in all the analyzed schools and courses. From the context, it encompasses all moments that takes you from an idea to a finished product (that is, a video, 3d-animation, picture or similar). However, while this is true when the concept is looked on as a whole, it's not true when individual classes are considered. They can instead limit it to, for instance, just the process of creating a media product, without considerations for economy or target group.

This makes this term tricky to use, but still it's central in the domain as such. With that said, it seems like there always is a practical, creative aspect to it. This can be compared with a movie producer, which is a strictly administrative, economical position. The producer leads and administers the making of a movie, instead of taking part of the actual process in making the movie.

Constraints and economy

There is a strong consensus that it's important for a media producer to be aware of constraints and limitations in a production process. The two most important factors mentioned are time constraints and budget constraints. A production must be delivered before deadline, and a media producer must be able to work within these constraints.

In order to keep within constraints, when choices are made, they need to take economic and time factors into consideration. As one of the curricula describes it "informed choices should be made" in regard to economic consequences.

Another important aspect, related to this, is to "be able to weigh cost versus quality", that is knowing which level of quality to aim for, depending on the budget constraints of the production.

Process

Understanding the process means having an understanding of all the steps in a production, from the generating of one or more ideas to the final product. It's a subset of the production aspect mentioned above, because it excludes the more administrative and peripheral aspects.

Also, not all classes include all these steps when we talk about the process. In some cases the idea generation and design phases are included, and in others it's more focus on sub-process within the entire production process.

The first aspect is mentioned in a number of places, and this hints at there is a methodology and a process that is taught that deals with the actual idea generating process.

In the second case, different courses focus on different phases of a particular type of production. Instead of specifying all the different processes in this overview, it's better to say that all media productions is made up of different processes and workflows, independent of type of production and independent of which scale you look at it. There are processes, and after that, the individual courses and context should dictate what kind of processes are taught/ included.

Problem Solving

This is the ability to solve new problems that occur in the production process, instead of relying on previous "how-to"-knowledge. One university describes this category as "identifying and formulating problems and acquiring the knowledge to solve those problems". This is often mentioned in a context that supports problem solving both as an individual, and as a group process.

Equipment

When discussing equipment, the focus is on handling and understanding how to use equipment for media capture and storage. Examples of this is still image cameras, video cameras, sound recording equipment, lights and similar. It also includes being able to operate in a studio environment.

It's also important to know the capabilities and limitations of various tools so that informed decisions can be made about when to use a certain piece of equipment or not.

Craft

The Craft category is well represented in the data. There is, however, not much explanation of what is meant by this, except for what is understood from more "common knowledge". As can be guessed, many of the occurrences of this category is related to the tools and equipment-categories, and is also closely related to the "Technology"-category.

As mentioned under "Technology", the Swedish word "Teknik" has two meanings. It can be translated into "Technology", but also "Technique", which is more related to craft.

Overall, craft is mentioned in various contexts, but always with the same basic meaning. It can mean the craft of video editing, 3d-modelling, animating or rendering, just to mention a few of the different crafts.

Materia

Materia in this context means all types of stored content and content containers. While the term ”materia” wasn’t found explicitly in the curricula in the way used here, there was a large amount of objectives and phrases that was about the capture and creation of various types of content, the handling of content and the manipulation of content.

However, as both capture, creation, handling and manipulating content requires interacting with the media, or content storage, the word ”materia” was chosen as a more neutral word.

Process

The pipeline is a sub-set of the production process. While the production process also with business and management issues, the pipeline focuses more on the development of the actual content from a technical perspective. For instance, it’s said that it’s important to choose the right tools so that they work in an existing pipeline, and to adapt the material so that it fits into the pipeline. Examples of the latter is to work with color and file formats in an informed way so that the end result is of high quality and is predictable.

Methods

Also related to categories like Craft, Equipment and Technology, the Method-category is about how you as a media producer does things. What is the procedure for animation a character, work with color correction or editing a movie.

There is also a relationship between methods and material. In short, if the material can be considered a noun, the method is the verb.

The students are expected to learn professional methods for working with media content, but also to have the ability to develop methods of their own, as needed.

Software Tools

It’s not only important to understand how software tools work (that falls under the more generic category of ”Technology”). Another aspect mentioned is to have a wider understanding of the different options that are available, and to have an overview of the software market.

The role and influence of the software tools is also highlighted. For instance, one editing course has ”Use of sound- and editing programs as a central hub in a media production” as one of it’s objectives.

Business

This category is related to the Industry Knowledge-category, but is more focused on the individual business. Issues like financing, entrepreneurial and professional attitudes and the economical issues that small scale studios and businesses face.

Legal issues are also important to have a basic understanding of. This includes questions about intellectual property, file sharing etc.

Finally, there's a sustainability-perspective related to this category. The production process, the software used and the conditions overall should be chosen with the aspect of sustainability in mind.

Content

This is a collection of categories that all are related to the content of the media production. These categories are aesthetics and semiotics, art and artistic ability, design, narrating and the ability to express and convey feelings and emotions.

The word that is most commonly used is aesthetics, or the study of what is visually pleasing and how to convey a certain mood or feeling. This word is most often used as the main representative for how something looks on a non-technical level.

There is a strong connection between aesthetics and technology/technique, and the students should have a strong understanding on how aesthetics and technology influence each other, and in some cases, be able to reflect on the problems concerning how technology influences aesthetics.

It also seems to be a core idea that media production is about the union between aesthetics and technology.

The design aspect is also important, and it touches on a number of different areas. It can be concrete, in that you can design layouts, graphics, images, sounds etc, but there is also a more abstract design concept, where you design solutions, processes etc. It should also be noted that the design process in itself is studied.

Overall, this is a large category, and there are more details than presented here, but going deeper than this would be going outside of the scope of this thesis. However, within this category is an important aspect in media production. The end result is important in how it looks, feels, sounds and what it conveys.

Industry Knowledge

Knowing the industry that you operate in is mentioned by a number of curricula. Both as a more generic overview, so that you as an actor know the conditions and circumstances in which you are working, and as a way to make connections and understand how to build networks. This is, among other things, a way to increase the likelihood of acquiring jobs in the future.

Analysis and reflection

Reflection and analysis is two important skills that have a wide range of applications in the various curricula.

First, it's the skill of meta-reflection, or reflecting and analyzing ones own abilities, strengths and weaknesses, as well as reflecting upon the need of new knowledge in oneself. The role as a professional is also mentioned here, as are ethical questions.

Second, it's the ability to analyze things around oneself, like design- and production processes, the final quality of a media production.

Media Production as described by Swedish Universities

The overall image provided by the study of media production is that it's a multi-disciplinary field. It can roughly be divided up in five major parts: Technology and practice, process/pipeline, business, producer and aesthetics. All these fields seem to be required to fulfill the role of media producer.

Technology and practice

This field encompasses the technological aspects of media production, as well as the craft and skill of the media producer in the use of the technology. While it's easy to consider this field a purely practical field, there is a strong emphasis on the deeper understanding of technology and the principles behind it. Concepts like problem solving, developing new methods for working and make informed choices and decisions in the process are also important.

Production process/Pipeline

The production process is the process that goes initial order to finalized product. It encompasses idea generation, problem solving, creating and designing the look of the product, creating all the materials and components needed and finally to package the finished product in a format that is usable for the client in the way it's supposed to be used.

In this process it's important to relate to factors like budget constraints, time constraints, what tools are used in the pipeline and so on. Unless it's a one-man studio or one-man job, it's also important to relate to other people and to communicate clearly.

A sub-section of the production process is the pipeline. The pipeline is the chain of tools and software that is used to produce the final product. This chain, and the individual items within that chain, must be taken into consideration when starting the project so that file formats, methods and tools fit inside that pipeline.

Business and industry

Working as a media producer means working within an industry with it's own special conditions and circumstances. In order to make the likelihood of success within that industry increase, many schools actively train the students in understanding how the industry works, what it looks like and who the major actors are.

Skills concerning running and working within a business of their own is also included in this. This is both about having an entrepreneurial and professional attitude and outlook, as well as having a good understanding of economics/finance and legal issues.

Content

While there are some different sub-skills and areas within this main category, the common denominator is that the end result of a media production should have a certain quality to how it looks and sounds. Skills and areas talked about in this category is aesthetics, semiotics, design, art and artistic ability, expression and narrative.

This field also both encompasses the skill to produce something that an observer would consider visually pleasing (and more important, fulfilling it's purpose) and to analyze other works and to reflect upon them using theories and principles from the same skills.

The Producer

There seems to be a strong consensus on that the personal development of the practicing media producer and media creator is important. Both analytical and reflective skills are taught, and the ability to reflect on your own strengths and weaknesses as well as evaluating the work of own and others is emphasized.

Relationships

These different fields and categories weren't found isolated from each other. On the contrary, they are described as having strong connections to each other.

Technology and Content
There is a strong connection between the categories Technology and Content. The most commonly used word is aesthetics instead of content, but in order to reason about all related aspects the word content is used instead here.

While there are many other factors determining the quality of the content, the technology is used to create the content, and therefore has an influence on the final result. In the same way, the final result as it is envisioned and planned is important to decide which tools and what technology to use.

Technology, pipeline and the production process
When technology is considered, it's mostly looked at as a single, isolated workstation, or a single tool. However, all instances of technology, methods and skills using these are parts of the pipeline. So, when designing a pipeline, consideration has to be made so that the tools used will fit into that same pipeline, and vice versa.

These design choices is then also affected by, and affects the larger production process. For instance, time constraints and budget constraints will affect what resources are available and suitable to use in for a specific production.

4.2.2 Information Systems

The subject of Informatics as such is often described as a multi-disciplinary subject. While different schools have slightly different emphasis the core ideas remain the same. It's described as the meeting point between social sciences, psychology and cognitive sciences, technology, economy, organizational theory, programming/ development and design. Another description is that it combines theory, practice and philosophy.

Areas mentioned in relationship to Informatics are businesses and business systems, web design, IT-strategist, project leader, media production and multimedia, industrial IT.

Relationships

When analyzing how the different schools describe the domain of Information System, one concept stands out. Instead of just listing and describing various key concepts one by one, there is a focus on the relationships between various concepts.

These concepts are the individual, society, organizations, IT and technology. While these concepts are important in themselves, the focus is on what happens when these interact. For instance, it's important to have an understanding on what happens when you introduce IT in an organization, or how society and IT affect each other. The most common relationship, however, seems to be between man and technology. What happens when these two meet and interact? How does one influence the other?

Scripting and development

When development is mentioned, it's a bit incongruent on what it means, depending on where you look. In some cases it's programming and scripting in various languages. In other cases, it's more aimed at systems development on a higher level. Both levels can be found though. The level of scripting/ programming found is often on a more basic level and/ or aimed at web programming or databases, but there are also examples of more advanced programming, like AI-programming.

When developing an IT-system for economics, for instance, it could very well fall within the domain of Informatics to do the actual programming for said system. However, if one where to focus on optimizing a single algorithm to be as quick as possible, that would more fall under the domain of computer science. (Dahlbom, 1996)

Methods

System development is not just about the actual programming, it's also knowledge about various methods for developing systems. Examples of this could be (but is not limited to) UML-diagrams, agile programming etc.

System development

Development also takes place on a higher level than the coding. It's also about designing the system as such. That means the entire process from deciding to build the system to setting up conditions and demands, coding, testing and finally deployment of the system. This is a core concept and activity within Informatics

Design

The term Design is found in mutiple places and has different meanings depending on where you find it.

One recurring feature is different variations on design with the user and the users experience and tasks in focus. It can be interaction design, user driven design, user centered design or design for user experiences.

There's also the design of services and products. This is usually related to the above. It's not about designing a software tool where the function of the tool is the focus, but it's more about designing services that helps the users with a specific task or operation. Related to this, the design of business models is also mentioned.

Finally, it's about designing a system and it's architecture and infrastructure.

Organisations

The organization perspective means looking at how an organization works, and the relationship between it, technology/IT, it's members and the surrounding society.

In this context, an organization can be clubs, volunteer movements, businesses or government agencies.

Issues that can be studied are the processes within an organization and how they can be supported by IT-systems, or how to implement a new system within an organization.

Related to this is the study of operations of an organization. Informatics is about the development, change, analysis and methodology of the operations. Both on a daily and individual basis, and on a larger scale.

Use

Informatics focuses heavily on the use of things. Compared with computer sciences where algorithms can be studied in themselves (for instance, in order to optimize their speed), in Informatics the focus is more on how something is used. When developing a new service, the goal is that the service should be used, either to facilitate an activity or support an operation, or to be a service that meets a need from users, so that they would want to invest in it.

Related issues to this are mentions of Interaction Design (although not from all schools), and a heavy emphasis on that IT-systems should support the ongoing operations of an organization of any kind.

Technology

The understanding of technology is important. Partly as a standalone subject, but even more so in regards to how it interacts and influences society, humanity and the organizations it's introduced in.

Understanding this requires, but is not satisfied by, an understanding of the technology itself, organization theory, human psychology and social science. In addition to this, it's also important to look at what happens in the meeting between these different actors.

Other things mentioned are skills in technical problem solving, and to be able to understand the limitations and benefits of technology in a given context.

Business and economics

There are two parts of the business concept. First, it's about developing, analyzing and adopting an IT-system so that it fits into and facilitates the processes of a given business. Examples of this would be to invest in a new economic system, or design an inventory/order-system for a business.

The other aspect is to develop products and services that can be transformed into a business, i e to sell them or to otherwise get other people or actors to pay for the service.

Operations

Informatics is often focused on the operations of of an organization, agency, business or individual. In different ways it's meant to support, facilitate and make the operations more efficient than before. To be able to do that, it's important to be able to analyze the operations, and either work on existing workflows within the operations, or develop new ones.

Just as when talking about organizations, this aspect can be either about the daily tasks that an individual agent within the organization performs, or it can be something that affects the entire infrastructure of the organization.

Information, data and communication

Informatics is about sending data and information, and thereby to support and carry communication. The understanding of these concepts are therefore important, and an Informatics student/expert should be able to define what those are and analyze them in a given context.

In addition to this, the need to understand how technology can be used for communication is included.

4.3 Interviews

4.3.1 Interview 1

The first interview is based on a course about sound and video editing. The course falls under the main area of Informatics, and it's subject group is media production. While the discussions were focused on that group, it is used as an example to highlight more generic principles.

The interview had three major themes. It started out with a discussion on how to evaluate quality and aesthetics of students assignements using an academic approach. The second theme focuses on the roles of the main area (Informatics) and the subject group (Media

production) and their effect on the course. Finally, There's a short discussion on a concrete example and how it relates to the previous discussions.

Evaluating quality and aesthetics

One assignement of the course is a video production, where the students records, edits and exports a short film. In addition to the actual practical work, the students also write a short paper where they reflect upon and motivate their work.

When asked about thoughts on what quality and aesthetics is in this context, and how they are evaluated, the interviewed teacher put the focus on deliberate choices.

As the interviewee puts it, the result of a production shouldn't be what it is because of pure happenstance. Instead the result should be deliberate and the result of conscious and informed choices.

A good result is also a production that is coherent, where the included components and design choices are parts of a whole.

When evaluating the result, it's important to not just look at how you evaluate the product, but rather how you think someone else, a generic viewer, would experience it.

The written document is an important part of the evaluating process. In this document, the student documents his or her thought processes and design choices, and motivates why these choices were made. From this document, you should be able to read and understand how the student thought about the production process. The teacher explains that "when the written and the production correlates, the result is often very good".

Since this process is important, the written part is usually considered to have a higher impact on the final grade than the actual result itself.

The problem with this, the teacher states, is that it is disadvantageous to students who are lacking in writing skills. This could be students that come from non-academical environments but who have a good understanding and a good eye for video recording and editing.

It's also a problem that it's hard to distinguish between being unskilled at writing, and to lack meta-reflective ability. In order to write about your internal thoughts and design process, you need to be able to reflect on that. In the experience of the interviewed teacher, especially newer students and students from non-academical homes have a harder time with meta-reflection.

To sum up, that means that a badly written report can be caused by a non-existant design process, an unskilled writer or a someone who makes good design choices but is unaware of the process around it.

When asked, the teacher agreed that it's important to train students in that meta-reflective process, and that it's not done enough.

Contributions of Information Systems and Media production

In the second part of the interview, the focus was on the academic categorization of the course. There are two categories to take into consideration. The main area is the area that the course falls under, and it tells which, if any, type of exam the course contributes to. The subject group is, officially, something used by SCB to classify the course.

When talking about these areas, the interviewee makes a clear distinction between the two. According to him, the subject group is the "heart" of the course. It states what type of content the course has, and also what the course outcome is. The course is *about* media production.

This particular courses contribution to the main area of Informatics, is the design aspect. There is a user-oriented design perspective in the course, and this perspective is what the course takes from the Informatics framework, and what it contributes to the final exam.

In this part, there is a reflection on the terms aesthetics and design. While the curriculum uses the word aesthetics, when thinking about it, the teacher admits that "design" would be a better choice of words.

Example

The interview was finished with a short example. Let's say that the student has the intention to make a short horror movie. If the student uses a design perspective, they first set out to study other movies in the same genre, analyzing them and finding out what makes them special.

The next step is then to apply these finds on the students own work, hopefully then achieving similar results.

According to the interviewee, this separates design from pure artistic endeavors. In the latter, there is no such preproduction analysis. Instead the artist just goes on a hunch, not following any set rules.

However, this shouldn't be interpreted as the designer never thinks outside the box, but just copies what others have done. "However, the designer also needs to think outside the box", as the interviewee puts it.

4.3.2 Interview 2

The second interview is with the program administrator for a three-year program that offers a bachelors degree in Informatics, but with a clear profile in digital media and media production.

Reflections regarding the program

When developing the program, the focus wasn't on the subject group or type of exam first. Instead, the focus was on providing an interesting program that corresponded to the students expectations. The main reason that it became a degree in Informatics is that that's the subject that was taught.

Media production is seen as a path that continues throughout the program, together a number of other subjects. These subjects include media informatics, webb-design and development and design theory.

Out of these paths, the one that is closes to the core of Informatics is Webb development and design. The reason for this is that there is a strong and clear connection to systems design. The program does put a strong emphasis on the webb-based aspects, and even the media production courses are mainly seen as a way to provide content for web. However, within the courses this isn't and doesn't need to be apparent.

The program as such is quite varied, as can be seen in the various paths mentioned above, and that results in some students expressing discontent with the program as such. They tend to feel that they haven't learned enough detailed skills in order to get jobs. According to the interviewee this subgroup mainly came from those interested in media production, and less from those interested in webb-development or design.

One thing that the interviewee stresses as a problem, both for the webb-centered parts of the program and the media production parts, is the need to be able to design aesthetically pleasing products. To solve this problem and cover that area, it was shoehorned into Informatics via the fields of design, development process and user centered design, among other things.

Currently, the program needs an even bigger focus on the design aspects, and less on informatics. When it comes to the issue about subject group, the interviewee refers to a discussion with a phd colleague who asked "Has anyone complained so far? If not, keep doing what you are doing!".

Reflections on the connection between media production and informatics

The interview started out with explaining the goal for the thesis, that is to find out if the discipline of Informatics is a good framework and a good subject to use in courses in media production areas. The reason for this was to get an insight into how the reasoning around the design of the Digital Media-program.

According to the interviewee, there is a relationship between the two disciplines, but there are also some areas where Informatics is sorely lacking.

In the program discussed, the media production courses can be considered to be applied Informatics. That is, Informatics gives processes for development and design, and these processes can be applied to media production classes. However, media production isn't dependent on that application in itself.

When reflecting on the two subjects, the main difference is perspective, what you look at. The interviewee considers media production a subject that is closer to engineering rather than belonging to social sciences. It's more on focusing inwards, on a specific detail, than to look at the surrounding society, as Informatics do. However, the latter is not clear cut in this, but remains in two camps. On one hand it's firmly rooted in the social sciences, but it also has more technical parts, like web-development and programming.

To describe the difference, the interviewee mentions an example from a student that has it's practice at a post-production company. "… He's doing a tatoo on a person, which is added in post production. He doesn't need to know anything about it. He needs to know, almost not even how it's supposed to be used. All he needs to know is how to make the tatoo fit the arm in this three-second sequence"

With that said, he adds the caveat that the students probably will want to change positions in the company and at a later stage meet clients, and then he needs others skills.

While we can justify the use of Informatics by pointing at the process to get from an idea to finished product, but even so, that framework don't give any answers about the final product. That would require the discipline to provide answers about aesthetics, which it cant. According to the interviewee, Gothenburg University approached the School of Design and Crafts to get input on how they handled the issue of aesthetics.

In Sweden, there isn't an academic tradition in regards to aesthetics that way. Not if one compares with, for instance, UK and their masters-programmes in Graphical Design.

Informatics, on the other hand, has a long tradiion in managing organisations. In that field, the aethetic factor is not something that needs to be considered.

The design process

Informatics has it roots in big administrative systems. However, as society and the discipline drifted towards more individualization, more emphasis was put on the surface. While it still has a hard time answering aesthetic questions, it's interesting that it can use the discipline of HCI, which talks about interaction design, for instance.

When asked about his view on Informatics and design, and if that is applicable for media production systems, he sees a problem.

"With my limited understanding of their professional situation, most of them will probably create content, and not interactive interfaces, and thats when a degree in Informatics becomes a problem. Or, maybe not a problem, but not a perfect match"

The interviewee was given the example of designing a sequence from a horror movie, similar to the example in the previous interview. Can those design processes and production processes be considered to be a part of the Informatics framework?

Another comparison was also given from a lecture by Peter Lord from Aardman animation. When they where in the beginning of their career as animators, they experimented with how to animate characters. One of their first attempts was that they drew and animated a character that walked, tipped and fell to the ground. When they had done the animation, they looked at it and asked themselves if it was funny? They saw that it wasn't, and did it again with some tweaks, and then asked the same question again. That process was then repeated over and over in an iterative cycle.

He agreed that those processes were found in Informatics as well, but that they aren't unique for Informatics.

"Theres's a process in everything. That's kind of an atom in society"

That iterative process that Peter Lord described can also be found within Informatics. But, as the interviewee describes it, that's not where it comes from. There are better roots than that. Better disciplines to look at would be School of Design and Crafts, architectural schools or schools for industrial design. He also mentions Donald Schön, who is often used in interaction design and Informatics and who comes directly from the architecture discipline.

He then adds another comparison between media production and Informatics. "When we develop an information system, it lives. The internal structure of a system influences what

the experience of it will be later". However, if you are making a movie, it's more static. The process will of course influence the look of the film, but it cannot change things afterwards. Then it's just the viewer and her experience that is connected with the material. Also, the movie is static, while the system should evolve and change.

With that said, however, one border case is when you are making a series of movies with the same resources. Then the process behind it becomes more important, and it can also be changed and developed.

Information System can help media production with things like processes, but there are other places where those things are found. Information System works, but isn't the best way.

The interviewee also talked a little about the importance of adhering strictly to the chosen field. "I was pragmatic before, and I'm growing even more after those conversations where it was said 'As long as you believe in it'". It's more important to build a program and an education that fits it's purpose, rather than one that fit's it's chosen area. When the program Digital Media was created, the discipline that we where in was the one that was used.

4.4 Litterature comparison phase

4.4.1 Informatics

Use

One of the core ideas that emerge when looking at the concept chart of informatics is the study of how technology is used in various ways. This is most apparent in the use of technology by individual humans, but the use of technology by organizations or society is also considered.

This interpretation is strengthened by peripheral skills like user centered design, user demands, user-driven services etc.

In the article "The New Informatics", Dahlbom (1996) confirms this interpretation, and uses the use of computers and technology, and how that use has changed, as a common denominator for the emergence of Informatics and later informatics (Dahlbom, 1996).

Wills et al (2009) also supports this concept when they talk about the users of a system as a key player, and they and the system must be "seamless and a ease" (among others) for the union between individual and technology to operate as one (Wills, 2009).

Organizations

The organization have an important role in informatics, as presented both by the study and by litterature. Dahlbom (1996) points out that the use of computer systems in organizations was among the first use of computers outside of pure computing (Dahlbom, 1996).

Technology - man - society

The union between technology, man and society is something that is central to many of the curricula. This is related to the use of technology, but extends beyond that.

Dahlbom (1996) describes that there is a dichotomy between for instance society and technology, or man and technology. However, he argues, that this is a false dichotomy, that in order to understand the role technology plays for society, and the other way around, that dichotomy must be abandoned. Instead, he argues, man and technology, society and technology are intertwined, and affect each other both ways at the same time (Dahlbom, 1996).

Design

There is a strong design-aspect in the discipline of Informatics. This is evident both in the curricula and in the litterature. When computers moved from the offices into the homes, and the use became more wide spread, disciplines like HCI and interaction design was amended to the informatics discipline. (Dahlbom, 1996)

4.4.2 Media production

Technology - Aesthetics

In the media production curricula of Swedish universities, the union between technology (and related categories) and content (aesthetics, design, semiotics etc) is strong and one of the fundamental factors

This relationship can also be found in the work of NCCA in the UK (Comninos et al., 2009). They were among the first to launch a masters degree that combined both technology and (using their terminology) art.

McCracken (2006) also puts forth a strong argument for a stronger fundamental understanding of the technical principles that underlie the tools that CG artists use to create. He never questions whether there should be a strong artistic side to these subjects, but have observed a trend that CG artists are drifting away from the technical understanding. He makes the comparison that the classical master painters not only were

excellent painters, they also mastered the tools of their trade, and mixed their own colors, constructed their own brushes etc. (McCracken, 2006)

However, he is also clear on the point that graphical/artistic talent is needed, and points at what happened when 3d software packages or desktop publishing software became available to a larger group of people. At first, their usage bloomed, and the talent of graphic designers and artists were forgotten. After a while, though, it was discovered that technology couldn't replace ability, and talented designers and artists were once again sought after. This time, however, the designers and artists had had the time to incorporate their skills and this new technology (McCracken, 2006).

Problem Solving

There are a number of examples in the curricula that talk about the ability to solve problems and to develop new working methods for media producers. It's about being able to recognize and formulate a problem, which then is solved through the use of already existing or newly acquired knowledge.

McCracken (2006) supports this, and claims that the ability to solve problems (technical and otherwise) is one of the most important abilities of a cg artist or media producer. This makes them more employable, and allows them to push the boundaries of their skills and their equipment.

Both McCracken and Comninos from NCCA argues the case that media producers and cg artists should learn some programming. The purpose of this is not just to learn the actual programming, but that with programming follows a certain mindset, a way to "think effectively" (Comninos et al., 2009) and be a better problem solver.

With this in mind, it's interesting to see that there are some curricula that have scripting or programming as a part of their objectives or course contents. It is not as common, however, as either McCracken or Comninos seems to prefer.

Pipeline and production process

The production process and pipeline have a central role in many curricula, and it sends strong signals that this is an important aspect for media producers.

This notion is supported by the current development at NCCA. They have a full educational program that leads to a bachelors degree, which focuses on managing the pipeline and understand both the technical and aesthetical aspects, so that they can be incorporated into a pipeline. (Hopper & Rainey, 2003)

It's also interesting to note that McCracken (2006) advocates that schools for Computer graphics turn to disciplines such as architecture and engineering to learn how they work with production processes(McCracken, 2006)

SIGGRAPH Working Group

The list produced by the SIGGRAPH Curriculum Working Group was meant as a guideline for computer graphics educations on what to include on the curriculum.

If we look at the list in it's entirety (included at p .13), and compare with the categories we have found in this study, we see that the list isn't complete.

Concepts Found	**Concepts not found**
Fundamentals	Math
Professional Issues	Human-Computer Interactions
Perception and Cognition	Real-Time Graphics
Programming and Scripting	Graphics Hardware
Animation	Advanced Topics
Rendering	
Modelling	
Digital Images	
Communications	
Cultural Perspectives	
Art and Design foundations	
Physical Sciences	

As can bee seen, the parts that are missing are the more technically advanced issues that are more aimed at dedicated programmers and developers, rather than media producers. This area was left outside of this study on purpose, and when that is taken into account, the discipline of media production as constructed in this study complies with the SIGGRAPH Curriculum Work Group recommendations.

Key objectives

The key objectives as described by both the swedish curricula and the litterature seems to be the following.

- The ability to create productions that reach a certain level of quality on a visual, audial and technical scale.
- Understand the relationship between technology and aesthetics (including related concepts)
- Design and work in a pipeline to create media productions in various forms.

- Communicate within a team and with people outside the field
- Have an understanding of the business of running a media production studio and understand the industry that the studio acts in. This include legal issues.

These key objectives, especially the first three, which can be considered more crucial to a media production must be satisfactory answered or handled by the informatics framework for that field to be a satisfactory field to host media production within.

4.5 Final analysis

The first part of this section is a more generic text on the relationship between media production and informatics. After that, the key objectives identified in the previous section is listed and an attempt is made to evaluate whether informatics can provide a framework that satisfies those objectives.

Finally, from those answers, an attempt is made to answer the main question of this thesis and provide a motivation for that answer.

4.5.1 On the relationship media production and informatics

There are a couple of aspects where Informatics and Media Production seem related. They both are situated where different disciplines meet. They both have a technical aspect, and they also need to balance that with knowledge of the surrounding world. In the case of Informatics, this technical aspect is actual development and programming, and for media production is the ability to handle complex computer programs like 3d-programs or post production tools. In Informatics you look at the end user of a system, and in Media Production you look at the recipient of a product.

There are design aspects in both areas and can use similar methodologies. However, as mentioned in the second interview, this shouldn't be view as Media production can use the design principles from Informatics. Instead one should look at the same source that Informatics did, namely classical design-schools, like architect school and industrial design. With that said, Informatics has already gone through the process of integrating those design principles into it's domain, and when applicable the Media Production domain should be able to take inspiration from that process as well. It's interesting to note that McCracken (2009) also suggests that computer graphics related educations would benefit from learning from architecture and engineering schools.

Technology and content

In the analysis there are several cases where the relationship between technology and the aesthetic and/or content of the final product is mentioned. Either to be looked at as a problem or to understand the relationship between the two.

In this question, we find a parallel issue in the domain of Informatics. There is a discussion between two paradigms, the social constructivist paradigm and the technological determinists. The former state that society and it's flow dictates the development of new technology, while the latter state the opposite, that technology dictates how society behaves.

Between those extremes there is a third position that say that they both affect each other. It's a flow between technology and society back and forth.

If this third position is used as a way to look at the relationship between technology and content then it means that the direction of influence between the two isn't one-directional either. Instead, it's acknowledge that the technology will affect the final result, and that the result you want dictates what technology is used.

While some lift this as a problem, it should also be noted that many stylistic and thematic expressions grow from limitations and/or possibilities given by the technology used. Examples of this would be Film Noir, that uses stark contrasts between black and white to convey a certain mood or the movie Lawnmower Man that used a specific technology using virtual particle systems to tell a story.

4.5.2 Evaluation of key objectives

In the previous section five key objectives was formulated and the objective of the thesis is to evaluate how well the discipline of informatics corresponds to these objectives.

The ability to create productions that reach a certain level of quality on a visual, audial and technical scale.

The study hasn't revealed a natural framework within informatics that provides a foundation for evaluating and leading to aesthetical, artistic or well designed results. While it can be argued that there are aspects of iterative design processes and user centered design in designing media productions, informatics isn't the only provider of these frameworks. Rather, informatics has lifted those frameworks from other areas, like industrial design and architecture.

Understand the relationship between technology and aesthetics (including related concepts)

While informatics gives some insight in the relationship between technology and the user, the very specific tools within media production seems to fall outside the range of informatics. While there is nothing within the field of informatics that excludes these tools, there is no theoretical foundation for their use within informatics either.

Design and work in a pipeline to create media productions in various forms.

One of the core functions of informatics is to build systems that can help organizations and businesses with processes and information flow. In this objective, informatics can provide valuable knowledge and insights. One of the interviewees describes it as "applied informatics", where the media production pipeline is one possible application of informatics and Informatics. However, there are also engineering disciplines that study production processes and pipelines.

Communicate within a team and with people outside the field

Working in projects and teams is not uncommon within informatics. However, the theoretical framework as such is more on an organizational level than on an interpersonal.

Have an understanding of the business of running a media production studio and understand the industry that that studio acts in. This include an understanding of legal issues.

There are strong connections between informatics and business organizations. For instance, the development of e-services, economy systems, accounting systems and similar are all core activities within informatics. However, informatics isn't the only discipline that teaches business, economy and law.

4.5.3 Evaluation of informatics as a whole

The issue that this theses set out to investigate was the following:

Is the theoretical framework found in the Informatics discipline applicable to the the domain of Media production, so that Media Production can be considered be a part of Informatics?

This was examined by trying to find a number of key objectives in media production, and then by analyzing the discipline of informatics, evaluate whether informatics could provide a framework that supports those objectives.

As could be seen in the previous section, it isn't a perfect match. There are some areas (mainly the aesthetic ones) where informatics fails to provide a framework or theoretical foundation, neither for how to achieve the objective nor how to evaluate and analyze it.

In other areas, like design methodology or pipeline-design, informatics can provide a framework, but so can other disciplines.

Based on the lack of support for the more aesthetical issues, and weak support for others, the direct answer to the question posed by the thesis is that media production shouldn't be a part of informatics.

5 Discussion

This study came to the conclusion that media production shouldn't be a part of informatics. However, there are still areas within media production where informatics can provide good support. Mainly this is in the production pipeline, helping to design an infrastructure through which a production works.

It should also be noted that while informatics doesn't fulfill all objectives, the discipline does provide a foundation for most of them. It can even provide some support for the more aesthetic objectives within media production, although with some tweaking. With this in mind, it's not impossible for a media production education to use informatics as it's framework, even though it's not an optimal solution. What makes this possible is that informatics borrows from other fields, and media production would need to borrow from those same fields, like architecture, industrial design, engineering and economics.

When media production in Sweden starts to emerge as a discipline on its own, it's still advisable to look at informatics for tips and ideas. As mentioned before, the two share many similarities, and it's not impossible that valuable lessons could be learned from the development of informatics.

5.1 Future of Media production

Currently, media production (in it's various forms) is a domain that lacks higher degrees. It's just recently that some schools have introduced Masters degrees in media production-related subjects (for intance, audiovisual studies in Dalarna). However, in order to be fully established as a subject, more work needs to be done. For instance, senior lecturers is needed to give exams within the area, and in order to educate phd-students within the domain itself, a professor is needed.

As this study showed, the different classes and courses that falls under the domain uses a wide range of subjects. While one of the points with the Bologna process is that you should be able to define your own subjects, it also leads to some confusion as regarding to what you can do within the domain. For instance, in what ways is it possible to make the technology-aspect more academic. If there is one clear subject (Media Production, for instance) then there can be studies done and articles written that is clearly related to that subject and it's easier to get an understanding of the limits of the domain. In the absence of that we have a number of schools that struggle with the same issues, but have a hard time helping each others with those struggles due to the different subjects.

Finally, in order to build a coherent domain, it's important to build a collection of studies and articles that aim at this particular domain. These articles should be spread over the entire domain, not just those that traditionally are more well researched from other areas (like communication or working in teams).

5.2 Future studies

This study is an early study of the media production landscape looks like in Swedish universities, but it has only scratched the surface. A number of questions has been raised during this study. In interviews and in the litterature, it's mentioned that disciplines like architecture and some engineering schools can provide frameworks for strengthening the subject. This area is open to research in order to find and modify methods from those areas so that they can support the media production field.

The concept of problem solving is presented as an important factor for CG artists and media producers. Training students in this is a pedagogical challenge, and an area that would benefit from further research as well

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