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Visual Literacy Practices in Higher Education

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Declaration

I certify that all material in this dissertation which is not my own work has been identified and that no material is included for which a degree has previously been conferred upon me.

...Julia Schellenberg... (signature of candidate)

Submitted electronically and unsigned

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Abstract

In our media-driven age visuals are increasingly frequent and prominently present in society and their importance and influence across academic disciplines is growing. This makes it essential to enable learners to become visually literate and justifies the need for teaching visual literacy competencies. Yet, there has been little research on visual literacy practices undertaken across academic subjects and institutions in higher education. Moreover, the key challenges and factors of success for achieving visual literacy education haven't been studied to date. Accordingly, this research aimed to elucidate the issues most relevant to visual literacy and to identify practices undertaken by universities/faculties and academic libraries. Explorative and descriptive research was conducted using literature analysis and an online questionnaire distributed to an international group of visual literacy practitioners. The results indicate that similar educational approaches were frequently chosen across academic disciplines and institutions. All practitioners encouraged their students to become critical consumers and producers of images and visual media. However, visual assignments were perceived as especially time-consuming and the assessment of student work may pose specific difficulties, especially in the light of constant technological evolution. In order to successfully implement visual literacy education changes to curricula, educational strategies, funding, and employee expertise are necessary.

Keywords: higher education, academic libraries, colleges & universities, teaching methods, educational strategies, visual literacy

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Chapter 1: Introduction

The first chapter gives background information on the need for teaching visual literacy competencies in higher education. It starts by introducing the world surrounding today's students and in particular, the influence of information and communication technologies. Furthermore, it describes the impact of visuals mediated through new media. It continues by explaining how these developments impact teaching and learning in academic environments and the need for students to be visually literate. Finally, the importance of the research is explained, the research questions are stated and the concept of visual literacy is defined.

1.1 Background

The tremendous spreading of new technological tools, and in particular communication and information technologies, has impacted the lives of younger people. (Bleed, 2005) Students that currently populate our colleges and universities grew up in a digital environment. This generation, also referred to as Digital Natives (Prensky, 2001), is unfamiliar with a life lacking digital technology. For digital natives the internet, mobility, and related technologies have always been available and they have gathered extensive networked media and communication experiences. They are used to connectivity anytime and anywhere and being always connected is something natural to them. (Windisch & Medman, 2008) Data compiled by Eurostat, Luxembourg have forecasted that in 2015 all students in the European Union (28 countries) access the internet daily and nearly as many participate in social networks, posting messages, and more. While, for example, almost 85 % are playing or downloading games, images, films or music using the internet (see figure 1). (Eurostat)

Prevalent is the dissemination of visuals mediated through digital media. According to Bleed (2005) we are daily exposed to a vast amount of images and people spend much of their income on visual media such as television, movies, photography, or video games. Metros (2008, p. 102) states that people are highly stimulated by a culture “with easy access to the visually rich Web, photo dependant social networks, video saturated media, and graphically sophisticated entertainment and gaming.” Formats have changed from text to graphical interfaces and graphical messages presented in media such as television, advertising or hypermedia permeates our technology-oriented culture. Last but not least visuals such as signs and images form an efficient way of communicating information quickly and effectively. (Brizee, 2003) Felten (2008, p. 60) argues that “the new ‘pictorial turn` means that images no longer exist primarily to entertain and illustrate. Rather they are becoming central to communication and meaning-making.”

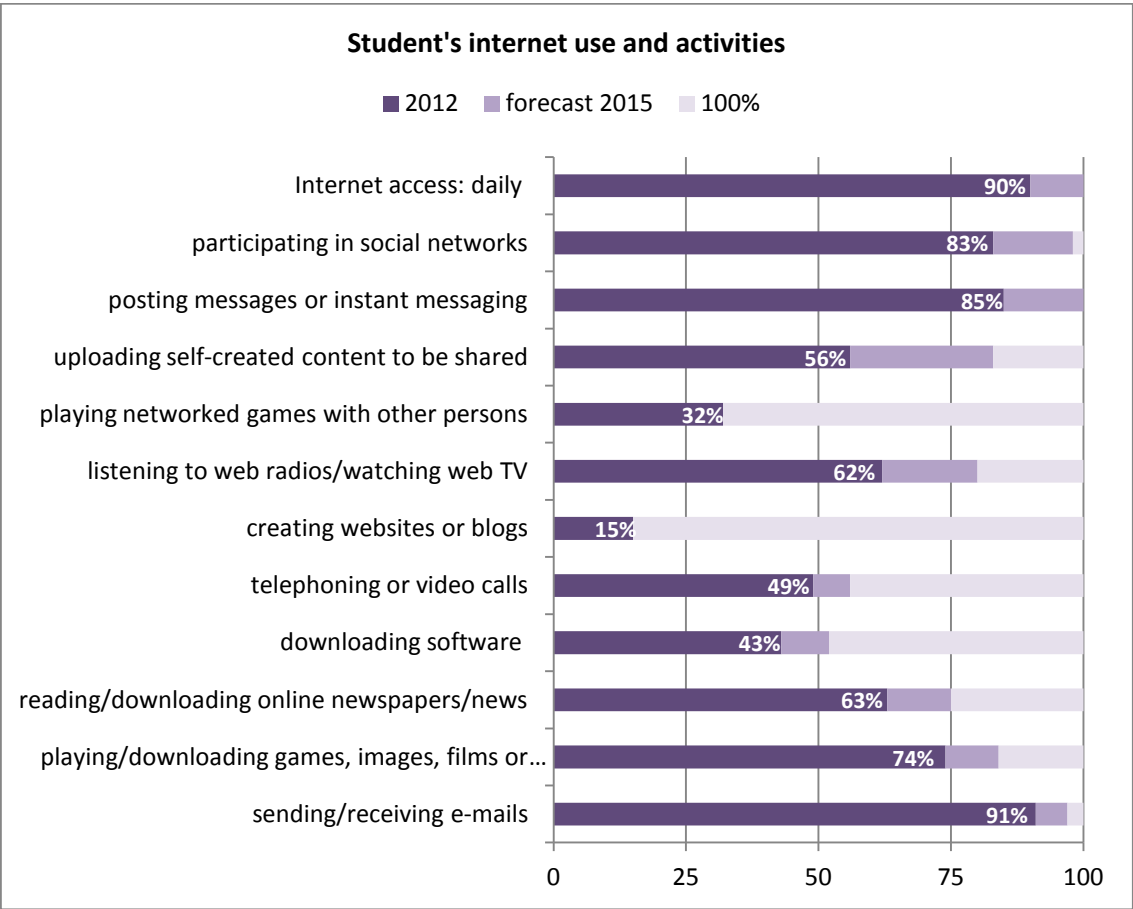


Figure 1. Student’s internet use and activities: European Union (28 countries)

The possibilities offered by new media have not only influenced the way of communicating and dealing with information. Messaris (2012) states that detecting inaccuracies in visuals becomes more challenging as techniques for the digital manipulation of photographs and the creation of computer-generated photorealistic images have increased. This is also described by B. Anderson (2007, p. 64) who argues that “seeing is believing” is no longer viable” as it becomes more difficult to distinguish in what components images are real and in what manipulated.

Through media experiences young people learn about themselves and the world. Referring to Chung (2007, p. 34) “it is not surprising that the issues people talk about, the things they use, or the lifestyles they choose are greatly influenced by what they see on television, the Internet, commercial billboards, and in newspapers and magazines.” Chung states further that this directly influences younger people as “media images in contemporary visual culture are colored by commercial interests and are embedded with a certain set of values, beliefs, and attitudes that influence viewers’ everyday choices and decisions” (p. 34). According to Bleed (2005) this circumstance makes it essential to understand the visual world around us especially, as media takes advantage of visuals to communicate and influence thoughts and behaviors.

1.1.1 The Proliferation of Visuals and the Impact on Educational Institutions

The visual explosion is not only a popular culture phenomenon. The opportunities offered by new technologies have fundamentally changed teaching and learning practices in many academic disciplines. The use of instructional technology is ever-increasing and leads to a larger portion of digital content used for classroom instructions (Bleed, 2005) According to Harris (2010) more disciplines gain access to efficient imaging technologies and the benefits of these resources in the creation of new information and knowledge becomes increasingly important. Applications range from presentation software to virtual classrooms. Students are expected to use these tools to create work that

includes visual materials. (Mayer & Goldenstein, 2009; Nelson, 2004) Likewise, digital and technological contents are particularly interesting to today's students. (Prensky, 2001) Younger generations are more comfortable with image-rich environments and prefer graphics before text. (Manuel, 2002; Oblinger & Oblinger, 2005). Educators should take advantage of these interests and skills of students to recapture the attention of the students they teach. (Avgerinou, 2009; Flynt & Brozo, 2010)

Recent changes in technology and the increasing importance of visual media have also led to a shift in academic libraries. (Nelson, 2004) Mayer and Goldenstein (2009) state that academic communities increasingly recognize the value of images for research and instruction. Accordingly, libraries must take this opportunity to improve access to image collections and to include image-related library instruction across disciplines. The authors Hattwig, Bussert, Medaille, and Burgess (2013) argue that academic libraries should expand their relevance to academic communities by serving as resources for visual media production.

The vast proliferation of visual media and the direct impact on younger people indicate that education has to adjust to this change. Yet, educational institutions have not adjusted to these developments. Verbal and textual forms of communication have long been the focus of teaching and the importance of visuals has not always received the same attention in a student's education. (Bleed, 2005; Felten, 2008; Mayer & Goldenstein, 2009; Portewig, 2004) Avgerinou (2009, p. 32) argues that "educators need to recognize that all teaching and learning experiences involve communication and that communication cannot any longer be limited to spoken or written word." Referring to Harris (2010) students require the same assistance in relation to visuals as students receive towards written sources. Educational institutions have traditionally placed emphasis on textual literacy. Bleed (2005, p. 8) states that "visual literacy is often considered trivial, transitory, or even nonacademic." However, according to Hattwig, Bussert, Medaille, et al. (2013) the concept of visual literacy has become

important for student teaching across higher education. In consequence, it is essential to integrate visual literacy education into the curricula at colleges and universities.

1.1.2 Students Abilities towards Visual Information

Day by day, students are faced with countless activities involving the reading and analysis of information delivered in visual forms. (Harris, 2010) Yet, how many students have actually been taught how to read and write visuals at colleges and universities? Living in an image-rich world does not mean students naturally possess sophisticated visual literacy skills. (Association of College and Research Libraries, 2011; Felten, 2008) Oblinger and Oblinger (2005, p. 2.5) have argued that younger generations are “intuitive visual communicators [...] [and] more visually literate than previous generations” However, research findings on student’s abilities towards visuals do not suggest the same. For example, Brumberger (2011) has researched students’ ability to recognize and understand meaning from images as a measure of visual literacy. The author found that today’s students do not possess a high degree of visual literacy. Another study by Emanuel and Challons-Lipton (2013) has assessed student’s visual abilities towards generally well-known images. Research findings have suggested that “today’s college students may be adrift in a sea of images with little ability to see beyond their own generation” (p. 7). While students were most familiar with contemporary images such as the Facebook symbol and a Twin Towers photograph, paintings by Monet and Picasso were least recognized.

It seems that young people are not equipped with the necessary skills in order to engage capably in a visually-oriented society. Yet, students need to become visual literate because visual media is an integral part of how we work, entertain, communicate, and educate. (Bleed, 2005)

1.2 Problem Statement

The introduction revealed that visual literacy education is of great interest to academic communities and in particular to colleges, universities and academic libraries. Yet, there has been little research on visual literacy efforts undertaken in higher education and how visuals are used in teaching across subjects and institutions. Few publications compiled visual literacy practices undertaken in universities/faculties (Elkins, 2007; Little, Felten, & Berry, 2015) or academic libraries (Mayer & Goldenstein, 2009). Moreover, there is a lack of published research examining the issues an institution face which decides to integrate visual teaching. However, an understanding of these issues is essential for a successful implementation of visual literacy education. According to Little (2015) visual literacy is still emerging in many academic disciplines and institutions and there is much to learn about teaching practices. Therefore, this work aims to contribute to the growing body of knowledge on visual literacy practices across disciplines and academic institutions.

1.3 Research Objectives

In general, research questions emerge after reviewing literature and are then used to enhance the understanding of the topic under investigation. However, in the context of this work little research can be related to visual literacy practices across higher education (see problem statement in section 1.2). Therefore, research questions were developed during the first stage of reviewing literature. It was observed that practices were undertaken both by universities/faculties and academic libraries. University/faculty practices were often related to a specific subject. Furthermore, visual literacy education was impacted by several issues such as challenges associated. Research objectives of this study were as follows:

The first aim of the study was to examine if visual literacy practices were undertaken by universities/faculties. Particularly, if individual disciplines promote specific visual literacy competencies and hence undertake aligned activities. The relevant research questions were defined as follows:

RQ1 Do universities/faculties promote visual literacy competencies?

RQ1a What practices are undertaken by universities/faculties?

RQ1b Are these practices related to a specific discipline?

RQ1c Do specific disciplines promote particular visual literacy competencies?

Outcome: These questions were expected to reveal, whether and what visual literacy practices were undertaken by universities/faculties. Furthermore, it was expected that findings could contribute to the understanding if particular subjects promote specific visual competencies or in case these don't practices can be applied to a wide range of subjects. Findings might reveal what competencies could be taught across universities, for example by offering specific visual literacy courses, and what competencies should be better taught by subject specialist.

The second objective was to assess if visual literacy practices were undertaken by academic libraries. In particular, whether they promote specific competencies. The relevant research questions were as follows:

RQ 2 Do academic libraries promote visual literacy competencies?

RQ2a What practices are undertaken by academic libraries?

RQ2b Do academic libraries promote particular visual literacy competencies?

Outcome: It was expected that these questions could reveal whether libraries support visual literacy. Further, whether specific visual competencies are taught and what efforts can be distinguished from

those undertaken in the university/faculty. This could contribute to the understanding in what efforts the university/faculty and academic libraries can collaborate.

The third aim was to assess issues impacting on visual literacy education. This includes challenges associated and potential factors that make visual literacy education a success. The relevant research questions were as follows:

RQ3a What challenges are experienced by visual literacy practitioners?

RQ3b What are potential factors that make visual literacy education a success?

Outcome: It was expected that the findings could contribute to the understanding of issues that impact visual literacy education. In particular, what is important to consider when including visual teaching and what facilitates a successful implementation.

1.4 Methodology

According to Pickard (2007) the three major research paradigms currently accepted in information and communication related disciplines are positivism, postpositivism and interpretivism. Positivism and postpositivism research paradigms are experimental and manipulative in nature and mainly concerned with hypothesis testing and quantitative data collection.

This study follows the interpretivism research paradigm which sees the nature of reality as bound to time and social context. (Pickard, 2007) In this research these issues are important as behaviors towards information and communication shift over time, especially as technology evolves. Pickard (2007) states the human instrument is an appropriate data collection technique while purposive

sampling achieves typical cases. Accordingly, purposive sampling was applied and an international group of visual literacy practitioners asked to contribute to the survey.

Both literature review and a survey among visual literacy practitioners were used as data collection instruments. According to Pickard (2007) interpretivism research can use qualitative data collection and analysis by case. For one, literature review examined cases of visual literacy practices. On the other hand, the survey among visual literacy practitioners asked for practices undertaken. The findings made it possible to understand issues related to visual literacy. According to Pickard (2007) inductive data analysis is a vital part of the qualitative research design. Inductive data analysis was applied as conclusions were based upon evidence presented in data. Data was analyzed using descriptive statistics and content analysis.

1.5 Definition

The term “Visual Literacy” was first coined by John Debes in 1969 who was also co-founder of the International Visual Literacy Association (IVLA) established in the late 1960s. According to Hattwig, Bussert, Medaille, et al. (2013)

since that time, visual literacy has been examined within the context of many disciplines and has evolved into a multifaceted, interdisciplinary concept. Its scope and definition are dynamic and have often been crafted to best fit particular contexts. Variations in the definition of visual literacy are quite extensive and these definitions themselves have been the subject of research and analysis (Hattwig, Bussert, Medaille, et al., 2013, p. 62).

This is reasoned in the multidiscipline nature of visual literacy. Bleed (2005, p. 6) describes “depending on a person’s background, the definition of visual literacy may differ, yet all are parts of the same

concept.” A computer professional may think of software and new technologies, and an artist of artistic expression, an academic of arts education, and so on. Moreover, digital information and visual media constantly evolve and definitions of visual literacy have shifted in meaning over time. Hattwig, Bussert, Medaille, et al. (2013) state that these definitions reflect “changes in technology, increasing interdisciplinary image use, and the importance of visual media in contemporary culture, particularly as a communication tool (p. 63).” Recent definitions describe the intersection of visual literacy with digital technology while some even speak of a digital visual literacy. (Martin, 2011; Spalter & van Dam, 2008)

In the context of this work the author refers to the definition of the Association of College and Research Libraries which reads as follows:

Visual literacy is a set of abilities that enables an individual to effectively find, interpret, evaluate, use, and create images and visual media. Visual literacy skills equip a learner to understand and analyze the contextual, cultural, ethical, aesthetic, intellectual, and technical components involved in the production and use of visual materials. A visually literate individual is both a critical consumer of visual media and a competent contributor to a body of shared knowledge and culture (Association of College and Research Libraries, 2011).

In 2011 the Association of College and Research Libraries (ACRL) has published the *Visual Literacy Competency Standards for Higher Education* which is specifically tailored to visual materials. (Association of College and Research Libraries, 2011) Hattwig, Bussert, Medaille, et al. (2013) state that the Visual Literacy Standards provides a comprehensive framework for teaching visual literacy skills. The standard offers opportunities of standard-based teaching and assessment for educators to develop students’ abilities towards visual materials. The framework includes seven standards which are as follows:

1. The visually literate student determines the nature and extent of the visual materials needed.
2. The visually literate student finds and accesses needed images and visual media effectively and efficiently.
3. The visually literate student interprets and analyzes the meanings of images and visual media.
4. The visually literate student evaluates images and their sources.
5. The visually literate student uses images and visual media effectively.
6. The visually literate student designs and creates meaningful images and visual media.
7. The visually literate student understands many of the ethical, legal, social, and economic issues surrounding the creation and use of images and visual media, and accesses and uses visual materials ethically. (Association of College and Research Libraries, 2011)

These standards are further defined by sub-categories describing performance indicators and learning outcomes. The standards in detail can be viewed at ACRL's website (Association of College and Research Libraries, 2011). The main ideas related to each standard are shortly illustrated in the visual literacy array (see figure 2, p. 12).

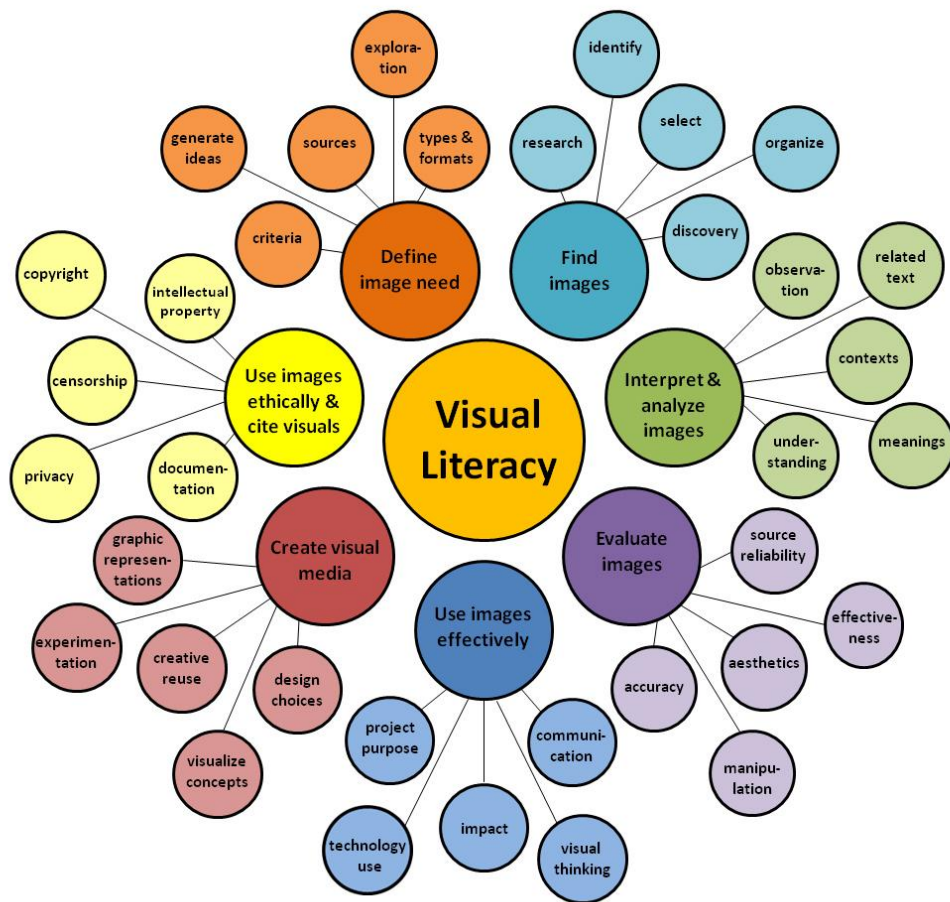


Figure 2. Visual Literacy Array based on ACRL's Visual Literacy Standards by D. Hattwig, K. Bussert, A. Medaille.

© 2013 The Johns Hopkins University Press (Hattwig, Bussert, & Medaille, 2013)

1.6 Limitations

Following limitations were applied to the study. For one, literature search was limited to articles published in academic journals using mainly the database EBSCO (www.ebscohost.com) for retrieval. Access to articles was limited to the subscription conditions of Tallinn University and Oslo and Akershus University College of Applied Sciences which can be viewed by following the references (Oslo and Akershus University College of Applied Sciences, 2015; Tallinn University, 2015). Full text databases which were accessed included: Academic Search Premier, Business Source Elite, Cinahl, EconLit, ERIC, Library Information Science & Technology (LISTA), and SocINDEX. Keywords used were a combination of the terms: academic libraries, educational strategies, higher education, teaching methods, universities & colleges, and visual literacy. The search results were limited to the years 2000 until 2015. Further, the literature reviewed was restricted to literature published in English.

Second, survey participants were found by looking at authors that had published about visual literacy practices in higher education. Therefore, it is quite probable that survey participants and authors of the literature reviewed intersect. Reasoned in this, findings of both data collection approaches namely literature review and online questionnaire were not directly contrasted. Instead findings of both approaches supplemented each other according to the research objectives (see section 1.3, p. 7).

1.7 Outline of the Thesis

This work is compiled out of four chapters. The first chapter gives a short overview of the world surrounding today's students. In particular, the influence of information and communication technologies and the impact of visuals mediated through new media. It continues by describing how these developments impact teaching and learning in academic environments and the need for students to be visually literate. Finally, the research questions are stated and the concept of visual literacy is defined.

The second chapter reviews the literature on visual literacy practices undertaken in higher education. An overview is provided on activities both undertaken in university/faculty and academic libraries. Further, challenges and factors of success associated with visual literacy education stated by various authors are presented.

The third chapter outlines the methodology used in the survey. This includes the sample strategy, method of data collection, data collection instrument, ethical considerations and data analysis methodology. Further, this chapter covers the survey findings and discussion according to the research objectives (see p. 7 ff).

The final chapter four presents the conclusion in regard to the stated research objectives by taking into consideration both findings from the literature analysis and the survey. Furthermore, limitations of this research and implications for further research are stated. Finally, the chapter ends with a conclusion towards visual literacy practices in higher education and implications for further research.

Chapter 2: Literature Review

The second chapter reviews the literature on visual literacy practices undertaken in higher education. An overview is provided on activities both undertaken in universities/faculties and academic libraries. Further, challenges and factors of success associated with visual literacy education stated by various authors are presented.

2.1 Related Work

There has been little research on visual literacy efforts undertaken in higher education and how visuals are used in teaching across subjects and institutions. Few publications compiled visual literacy practices undertaken in universities/faculties. For one, Elkins (2007) reported on several activities undertaken across university. The book included image-making and image-interpreting practices performed in various subjects including fields of science, social science, and humanities. Little et al. (2015) also gathered visual literacy practices undertaken in several subjects across university. One publication was found that mentioned visual literacy practices carried out in academic libraries. Mayer and Goldenstein (2009) conducted a survey of image use and access in academic libraries and found that *“librarians provide a variety of image-related instruction (p. 18).”* No research was found that examined the challenges an institution face which decides to integrate visual teaching and what factors can facilitate visual literacy education.

2.2 Visual Literacy Practices in University/faculty

In this section the various practices undertaken by universities/faculties are described. In summary, 43 relevant publications were examined. Of these publications 36 could be related to a specific subject by considering course content and affiliation of the author.

2.2.1 Astronomy

Crider (2015) taught students to read and write various types of visuals used in astronomy such as images, diagrams and plots. The author argued that astronomy is inherently a visual science and therefore it is fertile to teach visual literacy competencies. Students were required to interpret and analyze meanings of visuals and to evaluate their sources. Further, students synthesized visuals into presentations with attention to design and layout, accompanying text and image quality.

Slater (2010) engaged students astronomical thinking skills with visual literacy tasks by analyzing and internalizing the visual nature of astronomy. Learners were faced with a visual representation of astronomical phenomena, along with scientifically inaccurate descriptions. Students then were challenged to provide more complete and scientifically accurate descriptions to accompany the visuals.

In summary, astronomy educators promoted students to interpret and analyze astronomical phenomena and to evaluate their sources. Furthermore, educators supported students to use images effectively in their own work.

2.2.2 Biology and Biochemistry

Schonborn and Anderson (2010) considered it essential to explicitly teach and assess visual literacy competencies among molecular and cellular biosciences students. The authors described several visual literacy skills central for the promotion of visualization. Schonborn and Anderson stated that by developing skills towards visualization students optimize their ability to interpret external representations (ERs) and to use these as effective knowledge-building and communication tools. Further, these provided examples of tasks that instructors could use for the assessment of each visual skill.

Takayama (2005) argued for the significance of visual literacy in genomics education and the role of visualization in teaching genomic information. The author explained that genomics research depends upon comparative analysis and therefore visualization can facilitate the understanding of these comparisons. Takayama reported on an international online research project where students analyzed and reflected on genomic sequence and formulated models based on genomic analysis.

In summary, biology and biochemistry educators promoted the process of visualization as knowledge-building and communication tool. Students were required to analyze and interpret visuals, to use visuals effectively and to create, visualize and experiment with visual concepts.

2.2.3 Communication Studies

Motley (2015) described several approaches towards visual literacy used in communication courses. Students were encouraged to enhance their observation skills and to increase their depth of reflection by examining image-based cultural or historical artifacts. Furthermore, critical thinking abilities were promoted by following activities: speed-date critique where students accessed each other's images for a short amount of time; peer-workshop critiques where groups of students interrogated each other's work; pin-up critiques where students collectively displayed their images pinned to a

wall; self-assessment critiques in which students used a tool to evaluate their own work; and group critiques with invited professionals.

Pun (2009) reported on visual literacy activities that can support creative design in communication and marketing. Students learned how to express and conceptualize new design ideas paying attention to persuasion, visual perception and intended meaning of visual messages. Through background research, brainstorming and discussion with others students developed a creative strategy and developed a distinct brand identity for marketing. Students then applied design elements and principles to create a visual application like poster, stationery for a specific event.

In summary, educators in the field of communication studies supported students to interpret and analyze images and visual media. Furthermore, one educator promoted the design and creation of visual representation of a marketing idea.

2.2.4 Geography

Hollman (2014) promoted visual literacy abilities among students in geography. Students were asked to search for and to analyze and write about geographical images. They answered a series of questions used for deconstructing images and the influence of representation. According to the author “visual literacy in geography should mean stimulating knowledge of how images are produced and at the same time, despite being statements of place and time, construct our geographical imagination” (p. 144).

2.2.5 History

Volk (2015) illustrated activities of working with images in a history classroom. The assignments required students to make meanings of images and to use them as historical evidence.

Coventry et al. (2006) reported on five case studies from the Visible Knowledge Project (<https://cndls.georgetown.edu/about/grants/vkp/>) which used visual approaches to teach historical content and thinking skills. The authors engaged students to use visuals and new media to generate evidence of historical thinking. The first case study reported on an activity that required students to see visual evidence contextually which helped to teach historical reasoning. An image viewing assignment asked students to analyze and interpret images and specific texts directly related to the image. According to the author combining visual material with other sources helped students to comprehend context. The second case used exercises that confronted students with prior visual understanding about past events by analyzing moving images and still ones. The author collected and analyzed “evidence of how students read and reason from visual sources and use such evidence to help them develop more critical and contextualized visions of history” (p. 1386). The third case connected interpretations and evidence about race and slavery in scholarly studies. Students were asked to critically evaluate visual historical evidence depicted in images and to incorporate visual evidence into their analyses. The fourth case described how to make historical arguments using multimedia presentations. Students were required to create short multimedia narratives by bringing together video clips, images, narration, and music to build their arguments. The fifth case used new media to narrate and construct historical knowledge which then was presented to the public. The practitioner stated that “the public presentation of the digital history increases students' excitement about the relevance of the past as they see themselves as citizen historians imparting knowledge to others” (p. 1400).

In summary, history educators required students to interpret and analyze images and visual media and to understand embedded visual historical evidence. Furthermore, students were supported to use images and visual media effectively as historical arguments in multimedia presentations.

2.2.6 Linguistics

Visual literacy practices in the discipline of linguistics were subdivided into the categories composition studies and language education.

Linguistics: Composition Studies

Graham, Hannigan, and Curran (2005) argued to use both rhetoric and aesthetic practices to inform the analysis of visual images in the composition classroom. Students worked with advertising images and art and analyzed aesthetic issues such as design elements. Furthermore, students evaluated rhetorical elements considering whether an embedded argument is persuasive or ethical. Further students were asked to create images and visual texts. The authors stated that a deeper understanding between the visual and the verbal “may allow students to offer more sophisticated analyses as they consider the persuasive force of visual communication” (p. 21).

Brizee (2003) discussed the importance to teach visual literacy and document design to help students create, organize and present effective documents in college writing and beyond. The author stated that teachers “should learn how to teach students about visual literacy and document design so that they can effectively interpret these visually enhanced texts and create documents that use visuals and words together” (p. ii). Brizee introduced HATS (headings, access, typography, spacing) a design procedure for routine business documents to create attractive and well-designed documents. Further, the use of design elements such as colors, shapes, placement, contrast and balance were mediated.

George (2002) examined the place of visual literacy in the composition classroom. The author promoted the use of images to enhance essay writing competencies. George presented an assignment that requested students to make a visual argument focusing their work on the issues, people, or ideas found in reading and watching films. The form, medium and aim of the visual argument were upon the students and could be map, chart, web page, flyer, collage, painting or diagram.

In summary, practitioners in the subject composition studies promoted students to analyze, interpret and evaluate rhetoric (persuasion and ethics) and aesthetics (design principles) elements of images and visual media. Further, students learned how to use images in projects and how to create documents that include visuals effectively.

Linguistics: Language Education

Levine (2015) described teaching film and filmmaking in a second language course. The author combined reading, viewing, writing, lecture, and discussion with practical filmmaking workshops to improve student's language skills. Students explored historical, social, philosophical, and esthetic questions raised by film and video. These worked on assignments that drew attention to individual elements of audiovisual expression such as framing and composition, sound, and editing. Students learned how to use cameras, sound recording equipment, and editing software and created videos and films.

Kutch (2014) described how to use the graphic novel version of Kafka's *Die Verwandlung* to teach a second language. The aim of the practice was to support abilities in the areas of description and storytelling and to guide students through higher-level thinking about literary texts. The author prompted learners to analyze visual evidence by answering analytical and critical thinking questions. Firstly,

students matched vocabulary to images and described scenes. Then students studies ways that color, layout, and verbal/visual choices match aspects of characterization, theme and setting.

Christodoulou and Damaskinidis (2014) used visual literacy approaches in language teaching and learning. The course taught students basic requirements for understanding visual communication. Students learned how to decode visual expressions and to consider them critically. They practiced visual literacy when viewing, editing and analyzing video as an autonomous type of multimodal text. A systemic functional (SF) approach and multimodal discourse analysis (MDA) was applied to the analysis of the video.

Mathews (2014) described a variety of mini-lessons that prepared English language learners to strengthen their vocabulary development and reading capabilities. For one, the author used Shaun Tan's *The Arrival* - a book that displays the complexity of migration within a text that does not feature a single word. Students were required to analyze, interpret and discuss an image or segment of the book. The book then became an anchor to additional resources to enrich students' history knowledge and geography skills.

Seglem and Witte (2009) provided various assignments using visual literacy approaches in the English classroom. One practice used tattoos to promote the understanding of visuals as these required students to think beyond written text. Another assignment asked students to incorporate visuals into the research process which resulted in collages. Students learned how to paraphrase with images to convey information. After the creation process the students were asked to write about and explain the images as well as citing the original source. This prevented plagiarism as the process separated them of the language of the source. One assignment asked students to create symbolic representations of novels in the form of paintings. To begin the assignment students were asked to reflect on questions about symbolism and how concrete symbols can be used to represent abstract ideas pre-

sented in the books. An additional practice used persuasive advertisements. Students analyzed the advertisement, how the stories were developed and depicted in popular culture. Further, they were asked to create a parody advertisement themselves using the styles of the advertisement previous analyzed.

In summary, language educators developed language skills of students by asking them to analyze, interpret and understand visual evidence in film and graphic novels. These introduced modes of visual expression to make students understand visual communication. Further, students were asked to use technology and to create images and visual media themselves.

2.2.7 Psychology

Riener (2015) taught students competencies towards visual perception by studying illusions. Goals of the course were to understand how the brain produces visual experiences by studying the physics of light, the biology of the eye and the brain and the psychological experience of sight. According to the author illusions presented ways to change perspective regarding how the eyes work and “make us question what we are seeing, and in doing so, cause us to look closer, not just at the world, but at ourselves” (p. 51).

2.2.8 Sociology

Hyde (2015) described how photography can inspire and cultivate sociological mindfulness. The author explained assignments that use image analysis, making and writing to enhance students' sociological imagination and sociological inquiry. A self-portrait assignment explored the complexity of visual representations of social identity. Another assignment analyzed photography such as family pictures to learn about complex implications of familiar scenes. A shooting script exercise promoted students research skills and practiced formulating research questions. The assignment required students to analyze and organize photos, to identify patterns, and to consider which types of questions can/cannot be answered through photography.

2.2.9 Teacher Education

Visual literacy practices in the field of teacher education were mainly concerned with preservice teacher education. Additionally, practices that were associated to instructional technology were included in this category. It was observed that there is a strong connection between the education of future teachers and technology that enables these to provide course content.

Connors (2012) described a case that taught preservice students to critically think about visual texts from the standpoint of design used to convey meaning, focusing on visual aspects of graphic novels. The author proposed a vocabulary for analyzing and interpreting concepts of visual texts that enabled students to think and talk critically about multimodal texts. The vocabulary proposed three analytic concepts of visual design – shape (e.g. circles, squares, and triangles), perspective (the position from which an audience is made to view an image), and left-right visual structures (images are not necessarily processed linearly and the viewer can choose the reading path) - as resources for making meaning.

Rowsell, McLean, and Hamilton (2012) argued that “literature texts using visual elements offers opportunities for teachers to initiate the use of a critical lens to understand and interpret themes, structure, and content of texts” (p. 445). The authors proposed several activities that supported the understanding of visuals in context such as intended message, emotions and mood using multimodal texts.

Kovalik and Williams (2011) explored strategies of using cartoons to learn visual literacy competencies. Students created and contributed cartoons and participated in online discussions. The authors stated that “*as an instructional tool, the cartoons provided a new and innovative method of incorporating visual literacy into the online classroom*” (p. 60). Creativity and originality as well as the ability for students to think visually played a primary role in the creation process. Students indicated that working with cartoons was motivational and contributed to the understanding of the course content.

Flynt and Brozo (2010) discussed how teachers in content areas can use new media to integrate visual literacy instruction into their curriculum. They outlined a model for information and technology (ICT) integrated classroom that benefited from student interests and technological skills.

Sosa (2009) argued that besides making students aware of the conscious use of visuals it is important to provide students with tools that enable them to create visual products. The author instructed students on principles of visual design including page and screen layout, use of color, font and spacing, and use of appropriate images. Further, she gave techniques and examples on visually effective products. Students were taught to inspect visuals to become critical consumers of social context and meanings of visuals. Afterwards students were required to analyze their own work and the work of peers for visual appeal and usability. Sosa concluded that visual literacy competencies helped students to produce more professional and visually appealing work.

Sadik (2009) described approaches how to develop visual literacy skills using Flickr (www.flickr.com), an online photo hosting and sharing community. Assessment revealed that pre-service teachers' interpretation and understanding skills of visual messages were enhanced through online sharing and interaction through Flickr.

Burns (2006) described techniques for teachers to understand visual literacy as a counterpart to phonemic literacy. Teachers were supported to read and write visuals and how visual literacy techniques can be used across all subjects.

Wilhelm (2005) reported on using digital cameras to promote preservice teachers educational technology skills. According to the author one way to improve visual literacy skills is to use cameras which are have become cheaper and easier to use. The author provided a set of examples of how the use of digital cameras can promote teacher productivity and instruction.

McInnish and Wright (2005) used online discussion groups for instruction to teach visual literacy skills and concepts to students. Following reading assignments students were asked to discuss various visual literacy skills and concepts such as typography, figure and ground theory, gestalt theory, and technocentric qualities. Students posted on activities undertaken and created a website.

In summary, (preservice) teacher educators supported students to interpret, analyze and understand visual design principles and intended messages of visuals. Furthermore, students were taught how to create visual media and how to use technology to communicate course content.

2.2.10 Visual Arts

Visual literacy practices in the discipline of visual arts were subdivided into the categories art education, film studies and others. The others field includes two subjects, namely photography and industrial design.

Visual Arts: Art Education

As new media emerged in the common culture Carpenter and Cifuentes (2011) recommended that “art educators adopt those media to facilitate deep understanding of visual culture and literacy” (p. 33). They reported on an online image gallery entitled *Seeing culture* that enabled students to share and archive visual and verbal content. The tool enabled users to develop visual literacy competencies by learning about interpreting examples of visual culture. Students shared and edited images and contributed to each other's work. The authors stated that by engaging in social interpretations of visual culture students construct interpretations they would not derive in isolation. Students produced and achieved a variety of meanings informed by their own lived experiences.

Chung (2007, p. 33) explored issues of sexism in hip-hop music videos and stated that “*hip hop culture discursively glorifies sexist portrayals in the name of art*” and presents sexism as an acceptable, normalized social practice. This was particularly sensitive as hip-hop music videos have transformed into the American cultural and artistic mainstream. The author proposed pedagogical approaches that guided students in critically examining content, expression and context within hip-hop music videos that depict gender unequally. This included class discussions while scenes of hip-hop music videos were shown. Visual sites, linguistic plays of meaning, sound and the explicit and implicit messages being conveyed were analyzed and interpreted. Chung proposed questions that guided students in analyzing the scenes and students interpreted its meaning with respect to attitudes, values, self-image, and social expectations.

Another publication by Chung (2005) reported on the Ad-deconstruction project that aimed to facilitate art students' critical thinking and creative skills by deconstructing and reconstructing cigarette advertising. The author stated that advertiser purposeful arrange textual and visual elements of a work to achieve persuasiveness. The project required students to analyze cigarette-ad images, to assess its visual components, to evaluate visual techniques of manipulation, and intended or implicit messages. Finally, students redesigned cigarette ads with Adobe Photoshop and used the same techniques and strategies learned to unveil the truth about cigarette smoking.

Eber and Wolfe (2000) used computer graphics such as 2D and 3D imagery/animation to develop visual literacy competencies among art students. Students were required to analyze computer-synthesized images and to discover visual cues (e.g. polygons, surfaces, color, and shape ect.). Students learned specific terminology associated with the visual cues and identified how different visual elements can change the look, feel and interpretation of an image. By doing this students gained confidence with technological terminology and suggested alternative algorithms to create a desired visual look. They learned how to communicate effectively about and with visual imagery.

In summary, art educators support students to interpret and analyze visual design elements and to evaluate intended messages conveyed by images and visual media. Further, students created and designed visuals using technology such as editing software.

Visual Arts: Film Studies

White (2012) engaged students enrolled in a film criticism course to participate in a community engagement project, which resulted in the production of a short documentary. These highlighted different aspects of experiences made by African American men in community. The objective of the project was to connect visual and media literacy skills learned in the classroom, with the social and

cultural issues facing the community residents. One of the principles of this exercise was to heighten the students awareness to the fact that visual media may be used to misinform, distort, and manipulate. In the process, they gained a deeper understanding of how visual media is made and the implicit and explicit ethical choices that shape media production.

MacDonald (2010) connected genre film “literacy” with visual literacy in a film class and examined how genre films can operate in the culture. The author argued that “a specialized form of visual literacy develops as a child watches a narrative genre film. The child learns to read and interpret the generic formulas, codes, and conventions” (p. 42). MacDonald asked students to critically interpret popular culture and to detect embedded ideologies. One way to do this was to have students question the deeper meaning of genre films.

Nixon, Tompkins, and Lackie (2008) described a film-analysis assignment which required students to critique a documentary, paying particular attention to inaccuracies. Students needed to observe errors and to analyze, evaluate and critique stated facts and interpretations in the video based on course materials. Another project of Nixon et al. (2008) reported on a film short creation assignment that gave students experiences in visual storytelling through the creation of a video. The assignment was considered as conceptual exercise to detect student’s mode of expression. The students were required to collect images and to use video-editing software for the visual composition of the assignment. Criteria of the assignment included creativity in narrative, placement of camera relative to action, and depth of composition and editing.

In summary, educators in the field of film studies taught students how to interpret, analyze and evaluate cultural, social and historical issues mediated through visual media. Further, students created visual media.

Visual Arts: Others

Abrahmov and Ronen (2008) presented a learning model which aimed at introducing the concept of visual literacy in a traditional practical photography course. Web-based teaching used various online individual and collaborative activities in order to develop basic skills of visual literacy. Activities promoted the critical study of photographs by interpreting, analyzing and evaluating its components and peer evaluation through discussion with others. As stated *“the web-based component enabled us to engage the students in individual activity, where each student, in his own time, can develop his visual reading skills through a guided and focused set of activities, while learning from peer examples”* (p. 13). At the end of the course students reported that online activities were effective and contributed to their ability to read photographs.

E. Anderson (2003) stated that *“drawing is the most immediate and natural tool for generating and expressing ideas”* (p. 15). The author taught industrial design and engaged students to visualize design ideas by drawing. The author developed a framework for seeing, understanding, representing, and exploring three-dimensional information. This practice included several phases students (1) developed visual and analytical skills by analyzing visual features and functionality of a product, (2) undertook user research and examined if the product responds to user needs, and (3) based on findings of the user research students redesigned the product by drawing.

2.2.11 Practices across Subjects

Some practices could not be related to a specific subject. The majority of these practices were either applied to a wide range of subjects or visual literacy was aligned to information literacy efforts.

Palmer (2015) described a seminar course comprising a variety of creative learning activities to develop students visual literacy skills. The course, called Falling from Infinity (FFI) was highly interdisciplinary and drew on diverse perspectives such as literary, poetic, artistic, mathematical, scientific, religious, and philosophical aspects. Students were requested to explore, observe and analyze content and meaning of images. The activities included art analysis assignments, a photo essay assignment, painting assignments, and others. The author encouraged students “to think critically about how people in different disciplines imagine infinity and to begin to shape and creatively express their own views of the concept” (p. 20).

Harris (2010) offered guidelines for several learning activities in which both visual literacy and information literacy instruction can be provided. Instructions were based on concepts such as knowledge of visual conventions, critical viewing, and visual thinking. The author described an image analysis activity that asked students to analyze elements of a photograph and how these elements were relevant to the image as a whole. This approach was followed by asking students to list information that may help increase their understanding of the image. Another scenario illustrated by Harris asked student’s to analyze and contextualize art by answering a set of questions. This required students to brainstorm and to conduct further research on written sources that might help them to develop their understanding of the image. This included verifying the time period, the event and the historical circumstances depicted in the image. According to Harris this activity was also an opportunity to discuss the relationship between titles and images, between words and pictures. A third scenario provided students with examples of visual display of information published in magazine, newspapers, and journals. Students were asked to evaluate and rank the usefulness of the individual example by an-

swering questions. Further, students compared visual displays of data to determine specific target audiences. Another activity required students to reveal scholarly/professional imaging practices by determining the process used to create an image including examples of archaeologists, medical practitioners, business communications professionals, and scholars in the sciences. Students were asked to answer questions on effectiveness and usefulness of an image and skills required to create the image. Harris stated asking students to consider the imaging practices of a professionals or scholars can help student to replicate the process, or to consider the ways that the process may or may not relate to their own efforts.

Nixon et al. (2008) reported on a science-writing assignment that gave students experience in writing a scientific article. According to the authors the goal was to improve their writing and use of illustrations as well as their ability to read and interpret maps. Criteria used to evaluate student work included: connecting images and text, balance of figures and text, appropriate formatting, proper citations and peer editing.

Abilock (2008) reported on the use of documentary photographs to support visual information literacy. Students were required to practice interpretation by decoding the composition of a photograph, responding to its aesthetic elements and calling up personal beliefs and prior knowledge. Students had to label what they see in words and made inferences based on visual evidence (e.g. body language, facial expression and composition elements). Another suggested approach was to compare photograph pairings to identify similarities and differences. Students critically analyzed symbolic meaning and visual rhetoric and questioned historical, political, economic, and cultural context or social justice. This aimed for students to become conscious of the perspectives they bring to a visual image, to make distinction between argument and persuasion and to the veracity of a photograph. According to Abilock “these distinctions are at the heart of some of the most interesting aspects of visual information literacy: credibility and verification; point of view, reality and truth; journalistic

ethics and aesthetics; expropriation as visual plagiarism, homage, or parody; privacy and the public's right to know" (p. 11).

Farmer (2007) who worked in the field of educational technology, media and librarianship offered learning activities that helped students to become more effective consumers and producers of persuasive visual messages. For one, the author offered exercises that required students to critically view, analyze and interpret how visual elements and principles are used to convey an underlying message. Second, exercises how to manipulate images using technological tools such as photo editing software were proposed. The author stated "as they have access to technological tools and gain skills in applying visual principles to create persuasive images themselves, students enrich their communication vocabularies and find original ways to demonstrate knowledge and insights" (p. 32).

Hassett and Schieble (2007) contended that literacy instruction must include ways in which visual images and text work together and proposed ways to update accepted reading strategies. They argued that "new forms of texts, which do not rely primarily on alphabetic print, require readers to negotiate multiple levels of meaning while constructing connections within and across various textual elements (p. 67). They proposed using examples from picture books and graphic novels to negotiate multiple levels of meanings in visual texts. Students explored the multiple layers in a text, the various sources of information presented, and the many choices of interpretation and interaction with the text.

In summary, practices that were not related to a subject required students to analyze, interpret and evaluate visuals with attention to intended message, reliability and accuracy. Further, the effective use of images in projects and the use of technology such as editing software were taught.

2.2. 12 Conclusion

In general, all practitioners across subjects promoted students abilities towards analysis and interpretation of images and visual media. However, variations between science education including astronomy, and biology and biochemistry and were apparent. Science educators asked students to analyze, interpret and understand visuals in regard to the process of visualization. Other subjects focused on the analysis and interpretation of visuals with attention to rhetoric elements such as intended meaning as well as aesthetics elements including design principles. The study of aesthetic elements was most promoted in the disciplines of visual arts, (preservice) teacher education and linguistics.

The evaluation of images and visual media with attention to reliability and accuracy was supported in subjects that were not related to a specific subject. This might be reasoned in the fact that some practices included in this category aligned visual literacy with information literacy efforts.

The use of images and visual media in projects was also promoted across subjects. This competency was connected to the ability to create effective visual presentations. In science (astronomy, biology and biochemistry), however, students created, visualized and experimented with visual concepts of scientific phenomena. Other subjects used visuals to create visual media for example by using digital tool such as an editing software. The use of technology was most promoted in the visual arts, linguistics and (preservice) teacher education while the latter promoted technology to communicate course content.

2.4 Visual Literacy Practices in Academic Libraries

The following section describes practices that were undertaken by academic libraries. In summary, 6 relevant publications were examined.

Rybin (2012) explored challenges that arise in libraries that specialize in a particular subject such as law, business, and so forth and discussed solutions for these demands. These challenges included resource unawareness, discomfort with technology, and information overload. The challenge of resource unawareness was overcome by communicating and collaborating with several departments on campus and the main library. Through coordinated activities users then learned about database and imaging services. According to Rybin “presenting our high-quality images and complete data records along-side bad images found online is a vivid way to expand visual literacy proficiencies” (p. 273). To overcome discomfort with technology several services were offered. These included technology instruction such as the use of image databases, laptop settings and preferences, software such as video editing, scanning equipment, cameras, projectors, and more. Further, users were shown how to navigate image collections and how to organize personal image collections e.g. with image management tools to avoid information overload. The author stated that “educating instructors and students about these timesaving tricks and innovative projects is important to help offset any initial hesitation” (p. 274).

Ravas and Stark (2012) reported on experiences that encouraged students to examine visual materials under the information-literacy framework. The assignment aimed to help students to recognize the importance between printed and visual materials. Visual media from the travelling exhibit *Capture the Moment: the Pulitzer Prize Photographs* presented on campus were used to extend students critical thinking and analysis skills in regard to images. Students were asked to analyze and evaluate images according to a set of guidelines including bias, authorship, credibility, coverage, purpose, timeliness, and reliability.

Hoover (2011) provided examples on how to incorporate graphic novels into library instruction. The author stated that “the characteristics of graphic novels invite students to develop key critical thinking and information literacy skills and to challenge their pre-existing notions of the value of non-traditional sources of information” (p. 184). Several activities were proposed. For one, students located reviews of a chosen graphic novel and wrote a review of the reviews. Second, students conducted research on title, genre or aspect of a particular graphic novel using various information sources and search tools. The research process was guided by a search strategy including the formulation of a research question, identification of keywords, synonyms, and possible subject terms related to the title or topic. The results of the search were presented in the form of a bibliography. Next, students checked facts presented in the graphic novel. They identified the main ideas, data and other verifiable information to be researched and found sources that confirmed or contradicted the identified pieces of information. Another assignment asked students to translate information from a given source into graphic novel format. Students selected a graphic novel that has been adapted into a film and compared particular scene or segment. Students evaluated the difference between the source and the adaptation and the impact that the differences had on the reader or viewer.

Palmquist (2008) created a series of lessons teaching digital photography. At first, students were introduced to take well-composed pictures. Second, the genre photojournalism was discussed including composition and intended meaning of pictures. Next, students practiced storytelling through pictures and documented a particular aspect of their life, and finally the awareness of the power of editing software and the ethical use of digital tools was examined. The next unit taught portraiture and artistic expression. Examples of portraits were shown and students were asked to undertake a photo shoot and to make self-portraits. The authors also emphasized the creation of abstract, landscape and nature photography. At the end student’s work was shown to the public while these helped to organize the show and added artist statements.

Huisman, Miller, and Trinoskey (2011) incorporated the creation and use of word clouds for instruction, assessment, and marketing in their library. Students were asked to visually characterize elements of library instruction. This was achieved by creating digital images using Wordle (www.wordle.net) a free online tool that creates word clouds from text. Students made notes during library tours and sessions which were then recorded in the Wordle site on the computer. In that way the tool offered an active learning strategy as it engaged students throughout the instruction. Further, it was a quick check for the instructor if the exercises were understood. . According to the authors students enjoyed working with the tool. Furthermore, students could take an active role in instruction and assessment by recalling the most important aspects of instructional sessions.

Harris (2007) offered strategies for library instruction sessions related to images. Activities included locating images, evaluating and selecting images, and using or citing images. For one, students used subscription databases, online search engines and open access image collections to locate images. Second, students evaluated images based on the context an image was displayed. Images were compared using various resources (e.g. library resources versus web resources) and criteria for evaluating image resources were discussed. Using and citing images were taught by showing examples of image citations and how to construct citations for images using alternate sources for citation (e.g. digital and print source).

2.4.1 Conclusion

Library instruction often aligned visual and information literacy efforts. Librarians promoted students abilities to find and access images by introducing databases and search engines. These taught students to evaluate images with attention to accuracy and reliability and the ethical use of visual information. Furthermore, student's abilities towards interpretation and analysis of composition and

intended meaning were supported. Also promoted was the use of digital tools such as editing software, web tools and cameras.

2.5 Challenges and Factors of Success

Bleed (2005) stated that in order to successfully implement visual literacy education changes to curricula, instructional methods, campus infrastructure, learning spaces, budgets, and employee skills are inevitable. These issues were mentioned by several authors and challenges associated are explained in detail in the following section.

Nixon et al. (2008) surveyed faculty members to identify barriers they perceive when incorporating visual elements into assignments. The most commonly barrier indicated was that faculty members considered the assignments to be too time consuming for themselves and their students. This included the time involved in mastering information sources and tools associated with visual materials. Educators were also unsure about how to support student presentations. The majority of them indicated that they would like additional support for themselves and for their students. Nixon et al. stated that the multiplicity of media types, information sources, and tools associated with visual materials will require the expertise of academic support professionals throughout the institution. This would require a more finely honed support structure and professionals who can ensure that support is available and advertised to both students and faculty. Some faculty members also indicated that it was unclear how to evaluate student's work. To overcome assessment difficulties Nixon et al. suggested having faculty-led discussion and to explore effective strategies faculty members can employ to evaluate students work.

Metros and Woolsey (2006) stated that educators have difficulties locating professional resources and support services and they have even more difficulties to find the time to learn. Visual literacy is

dynamic as technologies evolve and skills need to be constantly updated. Furthermore, they stated that “faculty often lacks the experience and confidence to critically evaluate work that wanders outside the print norm” (Metros & Woolsey, 2006, p. 80). A shift from text to image is essential as text based achievements – reading and writing – are still the standard by which academic success is measured. Metros and Woolsey suggested that institutions should define core values of visual competencies and integrate these into curricula requirements. However, the authors stated that this transformation requires reexamining academic mission, core values and educational requirements. Furthermore, academic communities need the commitment of the college or university’s top leadership to implement visual literacy education successfully.

Metros (2008) proposed steps that could facilitate the integration of visual literacy requirements. Firstly, the academic community needs to be provided with places, people and resources that support the teaching and learning process. This includes budget for technology to facilitate visual activities. On the other hand, educators need help to determine which visual competencies are important. Further, they need assistance in developing learning objectives such as multimodal assignments and help in assessing student performance. Nevertheless, referring to Metros (2008, p. 107) “teachers need to avail themselves of the many professional development opportunities, services, resources, and tools available to help them incorporate quality media in their teaching practice.”

Little (2015) highlighted seven strategies for faculty developing visual literacy in classrooms and across the curriculum. Firstly, educators should carefully consider how visual analysis or creation helps students meet educational goals and objectives. Second, educators should plan assignments or activities that align with learning goals and outcomes. Third, educators should consider the ways in which experts and novices derive meaning from visuals differently. Fourth, assignments should be developed with attention to order, complexity, and timing. Fifth, teachers should model good practices for image use and help students understand current ethical and legal practices. Sixth, Little sug-

gested that visual literacy learning is best undertaken as a long-term part of teaching. Educators should steadily develop skills and resources needed to learn themselves and to teach students. Seventh, educators should consider sharing their experiences with others which enhances teaching and learning more broadly.

According to Hattwig, Bussert, Medaille, et al. (2013, p. 84) libraries can support visual literacy learning “by leveraging library spaces, digital collections, instruction, collaboration, and online resources” (p. 84). Furthermore, the authors suggested that academic library communities need to share successful visual literacy strategies, models of collaboration and engage in discussions about visual literacy assessment across disciplines. They argue that it is essential to participate in current dialogue about student’s visual literacy learning as academic libraries aim to align their services and collections with institutional requirements.

Mayer and Goldenstein (2009) argued that for libraries the communication with departments on campus is important. This can create solutions for facilitated access to individual collections. However, the authors stated that subscription image databases and digitizing collections can be expensive. Therefore, funding for providing sophisticated access to images is needed. Therefore, Mayer and Goldenstein proposed that libraries can link from their website to freely available image collections that match user needs. In their publication cited in the reference list some examples of useful image collections are listed. Further, the authors suggested offering workshops to students how to use image databases and resources available.

Rybin (2012) explored major challenges library users face when working with visual information and suggested solutions. Firstly, there is resources unawareness of visual resources on campus. Rybin suggested overcoming this unawareness by communicating and collaborating with departments on campus. Through coordinated activities users can learn about database and imaging services. Se-

cond, users are uncomfortable with technology. To overcome discomfort with technology several services can be offered including technology instruction such as the use of image databases, laptop settings and preferences, the use of software such as video editing, scanning equipment, cameras, projectors, and more. Third, information overload experienced by the users can be relieved by showing them how to navigate image collections or how to organize personal image collections e.g. with image management tools. The author stated that “educating instructors and students about these timesaving tricks and innovative projects is important to help offset any initial hesitation” (p. 274). Rybin argued that libraries should listen and participate in discussions with teachers and students to reveal what is working well and what needs to be improved. Further, the author stated that it is important to continually assess, evaluate and adapt training sessions, especially as technology evolves.

2.5.1 Conclusion

Several authors stated that successful integration of visual literacy education requires changes to academic mission, core values, and visual literacy competencies need to be integrated into curricula requirements. Instructional methods need to include visual learning goals, outcomes and assessment strategies. This would require the commitment of both parties the college or university’s top leadership and the academic community. Therefore the authors suggested that academic communities should share their teaching and learning experiences with others. Particularly relevant are educational and assessment strategies as well as models of collaboration across university and libraries.

The authors explained further that adequate funds need to be provided to facilitate visual learning activities. This includes appropriate learning spaces, visual resources and tools for multimedia projects. An enhanced support structure with additional services is important as faculty members and students alike need assistance in working with the multiplicity of media types, information sources, and tools, especially as technology evolves. A first step can be that libraries start to promote visual

resources on campus to overcome resources unawareness and provide instructions on image technologies and tools to overcome discomfort with technology. In addition librarians should engage actively in dialogue with teachers and students to reveal how libraries can best serve potential needs towards visual literacy teaching and learning.

2.6 Conclusion of Literature Review

In summary, 49 relevant publications were found in the literature and examined. The vast majority, 43 practices, were undertaken by universities/faculties while six were applied by academic libraries.

The majority of practices undertaken by universities/faculties, 36 practices, were related to a specific subject according to the course content or the affiliation of the author. Subjects identified were astronomy (2), biology & biochemistry (2), communication studies (2), geography (1), history (2), linguistics (8), (pre-service) teacher education (9), psychology (1), sociology (1), and the visual arts (9) (see figure 3). On the other hand, six practices could not be associated to a specific subject. These practices were either applied to a range of subjects or visual literacy was aligned to information literacy efforts.



Figure 3. Wordcloud presenting subjects associated to visual literacy practices found in literature

The most represented subjects with nine practices per subject were the disciplines teacher education and visual arts. Activities in the discipline visual arts mainly took place in the subject art education and film studies. These disciplines were followed by linguistics with eight practices. Practices performed in the field of linguistics could be divided into composition studies and language education. The other subjects were presented with one or two practices each.

In summary, all practitioners required their students to become critical consumers and producers of visual information. Critical thinking was promoted by self assessment using tools such as question sheets or group critiques where students collectively reflected on images and visual media. However, similar practices were frequently observed across subjects. These can be summarized as follows:

- Some practitioners supported scholarly/professional imaging practices, especially in the field of science (Crider, 2015; Harris, 2010; Hollman, 2014; Schonborn & Anderson, 2010; Slater, 2010; Takayama, 2005)
- Some practitioners improved the use of images and visual media in students own work (Brizee, 2003; Coventry et al., 2006; Crider, 2015; George, 2002; Nixon et al., 2008; Sosa, 2009)
- Some practitioners facilitated the use of digital technology to create images and visual media (Chung, 2005; Farmer, 2007; Kovalik & Williams, 2011; Levine, 2015; Nixon et al., 2008; Schonborn & Anderson, 2010; Takayama, 2005; White, 2012; Wilhelm, 2005).
- Some practitioners used multimodal texts such as graphic novels and analyzed aesthetic and rhetoric elements (Connors, 2012; Hassett & Schieble, 2007; Kutch, 2014; Mathews, 2014; Rowsell et al., 2012; Seglem & Witte, 2009).
- Some practitioners aligned visual literacy with related literacies (Abilock, 2008; Burns, 2006; Harris, 2010; Hassett & Schieble, 2007).

- Some practitioners used technology to promote visual literacy competencies. This included: web-based teaching and online discussion (Abrahmov & Ronen, 2008; Carpenter & Cifuentes, 2011; Kovalik & Williams, 2011; McInnish & Wright, 2005); instructional tools such as Flickr (Sadik, 2009), web tools for the creation of cartoons (Kovalik & Williams, 2011); 2D/3D imagery/animation (Eber & Wolfe, 2000) and cameras (Wilhelm, 2005), or outlined an ICT integrated classroom (Flynt & Brozo, 2010).
- Some practitioners taught persuasion and argumentation of visual messages using media such as advertising (Abilock, 2008; Chung, 2005, 2007; Farmer, 2007; Graham et al., 2005; MacDonald, 2010; Pun, 2009; Seglem & Witte, 2009).
- Few practitioners promoted creative thinking skills by the visual literacy practice undertaken (E. Anderson, 2003; Pun, 2009).

Slight variations/characteristics with regard to a certain subject could be observed. These are as follows:

- The science (astronomy, biology & biochemistry) emphasized the role of visualization and competencies related to the visualization process of scientific phenomena. (Crider, 2015; Schonborn & Anderson, 2010; Slater, 2010; Takayama, 2005)
- A marketing professional (communication studies) taught the persuasive force of visual communication and students created a brand identity for a specific target audience. (Pun, 2009)
- Some practices that could not be associated to a subject were related to information literacy efforts. (Abilock, 2008; Harris, 2010; Hassett & Schieble, 2007)
- History educators promoted visuals to enable students to use these as historical evidence. (Coventry et al., 2006; Volk, 2015)

- Composition studies (linguistics) emphasized visual communication with regard to argumentation and persuasion (George, 2002; Graham et al., 2005) as well as document design (Brizee, 2003).
- Language education (linguistics) mainly used films (Levine, 2015; Mathews, 2014) and graphic novels (Christodoulou & Damaskinidis, 2014; Kutch, 2014; Seglem & Witte, 2009) for language development.
- (Preservice) teacher education promoted visual design principles (Connors, 2012; Rowsell et al., 2012; Sosa, 2009) and educational technology (Flynt & Brozo, 2010; Kovalik & Williams, 2011; McInnish & Wright, 2005; Wilhelm, 2005).
- The psychology practitioner focused on visual perception and how the brain produces visual experiences. (Riener, 2015)
- Sociology enhanced sociological imagination and sociological inquiry by working with photography. (Hyde, 2015)
- Visual arts emphasized studying popular visual culture and embedded social and cultural issues such as ideologies, values and interpretations. (Carpenter & Cifuentes, 2011; Chung, 2005, 2007; MacDonald, 2010; White, 2012)

Academic libraries promoted visual literacy competencies. However, compared to the vast amount of practices undertaken in universities/faculties published in literature, libraries seemed to be less engaged. A minority with 6 practices were undertaken by academic libraries. Educators often aligned information and visual literacy efforts (Harris, 2007; Hoover, 2011; Ravas & Stark, 2012). Activities facilitated the access to visual resources as well as the use of database and of image technologies. Students were aided in identifying/locating images, evaluating and selecting images, and the ethical use of visual materials including copyright and citation.

Several instructional and institutional challenges that impact visual literacy education were mentioned by the authors. They can be summarized as follows:

Instructional challenges:

- Development of visual assignments is time-consuming and educators often don't have time to learn mastering the multiplicity of media types, information sources, and tools associated with visual materials, especially as technology constantly evolve.
- Educators lack the experience and confidence to critically evaluate and assess student's performance as academic achievements are commonly assessed considering merely text not images.

Institutional challenge:

- Institutions need to support educators in mastering instructional challenges. Visual literacy requirements need to be integrated into core curriculum. Strategies in regard to learning objectives, outcomes and assessment need to be developed.
- Adequate budget for enhanced access to visual resources and appropriate facilities for supporting multimedia assignments is necessary.

Successful visual literacy education needs overreaching institutional goals. This includes changes to curricula and instructional methods, employee expertise, and budget to enhance access to resources, multimedia equipment and learning facilities.

Chapter 3: Survey among practitioners

The third chapter outlines the methodology used in the survey. This includes the sample strategy, method of data collection, data collection instrument, ethical considerations and data analysis. Further, this chapter covers survey findings and the discussion according to the research objectives (see p. 6).

3.1 Methodology

Descriptive research using an online questionnaire among an international group of scholars was conducted. The descriptive survey approach was selected to gather data that describes the experiences of practitioners and to reveal themes and patterns within their responses. The objective of the survey was to identify current visual literacy practices undertaken by universities/faculties and academic libraries. Additional objectives were to reveal challenges and factors of success related to visual literacy education. The individual research questions are described in section 1.3 (p. 6).

The research design was based on the analysis of preceding data and the identification of concepts and ideas that required further and deeper investigation. Two questions were added to the research questions outlined in section 1.3 (p. 6): (RQ4) if visual literacy education is a stated mission of the institution, and (RQ5) if universities/faculties and academic libraries collaborate in teaching visual literacy competencies to students. These questions were added as the literature review revealed that both issues can impact visual literacy education.

3.1.1 Sample Strategy and Techniques

Purposive sampling was used to identify practitioners who could be associated to visual literacy activities undertaken in higher education. Potential participants were found by looking at the authors that have published in the field. About 90 scholars were contacted via email and asked to contribute to the research. Several of them reported back: 27 practitioners agreed to contribute to the survey; few stated that they were not active in the field anymore; few were on sabbatical vacation; and few had no time to contribute. The final questionnaire was distributed to the respondents that had agreed to participate. In addition, the Association of Visual Literacy was asked for permission to publish the questionnaire on their Facebook page (IVLA, 2015) which was subsequently granted. The questionnaire was open for responses for 18 days, namely from April 9th, 2015 until April 26th 2015.

3.1.2 Method of Data Collection

An online questionnaire was selected to reach internationally distributed practitioners. This approach was economical and the respondents were free to answer in their own time. However, the disadvantage was that there was a lack of opportunity to clarify issues, i.e. when questions led to confusion. (Pickard, 2007) The online tool Survey Monkey (www.surveymonkey.com) was used to design the questionnaire. The link to the survey was distributed to the participants via email.

3.1.3 Data Collection Instrument

This section describes the design of the online questionnaire and how the outcomes relate to the research questions (see p. 42). Further, the pilot study undertaken is shortly described.

The online questionnaire started with a short introduction on the purpose and objective of the study. Further, it was stated that answers are kept confidential, the time required to finish the survey and the deadline. On the next page, a short text referred to the visual literacy definition of the Association of College and Research Libraries (Association of College and Research Libraries, 2011). This introduced the participants to the concept under study. The following survey was divided into nine sections with one or more questions each. The questionnaire can be viewed in the appendix.

The question of the first section was related to RQ1 and RQ2 and revealed whether the practice was performed by university/faculty or academic library. The respondents could also select the "others" field, in case the practice was not undertaken in university/faculty or academic library.

The question in section two was related to RQ4 and aimed to find answer if the institution has a reference towards visual literacy in their institutional mission statement. Literature review revealed that education is likely successful if visual requirements are integrated into curricula or institutional mission statements. Hence, asking this question examines how many institutions actually have a stated reference towards visual literacy education. The evaluation of this question was integrated in the section successes experienced when teaching visual literacy to students.

Section three asked participants to describe the visual literacy practice performed in their institution. The section was divided into three single questions (1) aims & objectives, (2) educational program – steps and activities undertaken during the teaching process, and (3) teaching aids & devices – any materials, techniques, or media used to assist the educational process. These questions were related to RQ1a and RQ2a and aimed to get a description of the various practices undertaken by institutions. The section was divided in three sub-questions to point participants to issues that can further elucidate an individual practice.

Section four asked respondents what competencies were promoted by the individual practice performed? This question was related to RQ1c and RQ2b. However, the answers were not directly analyzed in combination with the practice undertaken. The objective was primarily to put some interpretation on competencies promoted by a specific subject or academic libraries.

The question in section five required participants to specify the academic discipline the individual activity can be associated with. The question was related to RQ1b and information complements answering RQ1c.

Section six was compiled out of three questions. These questions were related to RQ3a and RQ3b. Answers were examined on issues that impact visual literacy education including level of challenge, description of challenging factors, and issues which participants perceive make education successful.

The question in section seven was related to RQ5 and aimed to tell if the institutions collaborate in teaching visual literacy competencies to students. Literature review revealed that education can benefit from the collaboration between universities/faculties and academic libraries. Hence, the answers could show how many institutions actually collaborate across university and library. The evaluation of this question is integrated in the section successes experienced when teaching visual literacy to students.

Section eight asked participants to indicate the country the individual visual literacy practice was taken place. This answer was not directly related to the research objectives. The findings aimed to get knowledge on the distribution of the survey participants. This can inform limitations and future research as it gives an overview where practices were undertaken.

The last question, section nine, asked participants if those want to get informed about the study results. Survey participants were all visual literacy practitioners in higher education. Hence, those might be interested in the study results. This answer was not related to the research objectives.

3.1.4 Pilot Study

The researcher asked several authors that had published on visual literacy practices and had indicated not to be active in the field anymore to comment on the online questionnaire. Unfortunately, none of these reported back to the researcher. The pilot study was then done with two information professionals that have experiences in both qualitative and quantitative research. Some issues have been reported back. For one, the questionnaire was initially intended to be distributed by email with the questionnaire document attached. Questions were mainly open questions. Participants were encouraged to use as many space as necessary. However, one pilot respondent stated that this may cause barriers with regard to software program or computer (e.g. windows and apple). The respondent, for example experienced that there was a barrier with old and new version of the software program used. The other pilot participant stated that a definition of visual literacy as referred to in the survey would be helpful to define the concept under study. This definition was incorporated in the final survey. One participant stated that 15 minutes, the other that 30 minutes would be required to finish the survey. Finally, a value in between was selected and the survey was introduced to take about 20 minutes.

3.1.5 Ethical Considerations

Referring to Pickard (2007, p. 71) ethical considerations “face all researchers when engaging with other human beings in the research process.” In that sense, the researcher took into account the following issues. At first, the majority of participants (except those that contributed via the IVLA Facebook page – see sample strategy p. 43) were introduced to the research by email. This included information about the researcher, title and purpose of the research, data collection instrument and their voluntary involvement. Then, these were asked to contribute to the research by answering a short questionnaire. In the next step, all participants that confirmed to contribute to the survey received an email with a link to the online questionnaire. The online questionnaire stated that the answers were confidential and accordingly answers of the individual survey participants were analyzed anonymously. The answers were all collected online and the access to the portal used was password protected so that solely the researcher was able to access the data. In summary, all participants were sufficiently informed about the ongoing research and collected the data was well protected.

3.1.6 Data Analysis Method

The data gathered through the online questionnaire was a combination of open-ended, closed and scale items. These were analyzed using descriptive statistics and content analysis. However, the purpose was not to lead to a sophisticated statistical analysis rather to put some interpretation on the results and to supplement facts gathered through the literature review. (Pickard, 2007) Inductive data analysis was applied as *“it does provide a simple, straightforward approach for deriving findings in the context of focused evaluation questions (Thomas, 2006, p. 237).”* Data analysis was guided by the evaluation objectives (see p. 42).

Although the findings were influenced by the evaluation questions the results emerged directly from the raw data, not from prior research findings or expectations. (Thomas, 2006) To establish trustwor-

thiness of the findings attention was given to issues such as credibility and confirmability. (Pickard, 2007) For one, the researcher was aware that it was impossible to remove all subjectivity from the analysis process. Therefore the researcher was constantly alert and described findings using the statements made by the participants as closely as possible. This ensured that the results could be traced back to the raw data and that the research was not merely a product of the researcher's assumptions. Data analysis was undertaken following Thomas (2006) who described an general inductive approach which can be summarized as follows: what are the core meanings evident in the text, relevant to evaluation or research objectives? And, what are the themes or categories most relevant to research objectives? Finally, the most important themes were described.

3.2 Results

This section describes the results obtained through the online questionnaire. Findings are explained and illustrated using figures. In total 39 individuals responded to the survey of which 17 were uncompleted and 22 were completed. The 22 valid cases were subject of further analysis. Participants mainly came from the United States (18), followed by Australia (2), Canada (1), and Finland (1). The majority of practices with 17 cases were undertaken in universities/faculties and four cases by academic libraries. One case was marked with "others" which was an answer possibility in the first section of the questionnaire (see p.49). For further analysis this case was included in the category university/faculty and assigned to the field general as the respondent indicated that the practice can be applied to all subjects (see figure 4, p. 54).

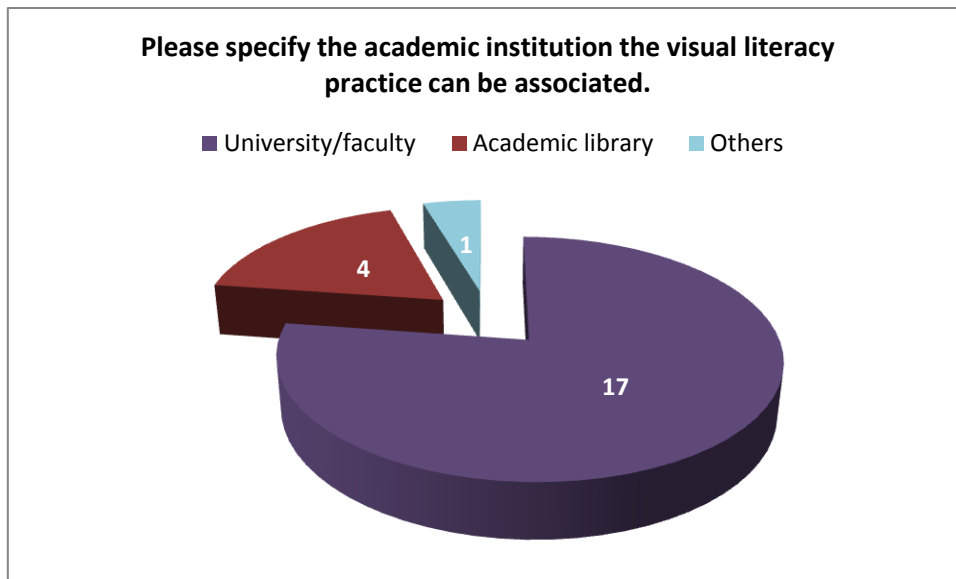


Figure 4. Academic institutions the visual literacy practices were associated.

3.2.1 University/faculty Practices

Of the 18 cases assigned to the category university/faculties 14 cases could be related to a specific subject. The remaining four cases were assigned to the category “general” as participants indicated various subjects. (Preservice) teacher education with five cases and the visual arts with four cases were the most frequent disciplines. They were followed by journalism and media studies with two cases. The least indicated disciplines were linguistics, history and biology with one response each (see figure 5).



Figure 5. Wordcloud presenting subjects of visual literacy practices indicated by participants

The analysis of the survey responses revealed the across university/faculty the most promoted competencies are to interpret and analyze the meanings of images and visual media (with 16 out of 18 cases) as well to use images and visual media effectively (with 17 out of 18 cases promoting this competency). The least supported competency was for students to understand many of the many of the ethical, legal, social, and economic issues surrounding images and visual media (with 10 out of 18 cases promoting this competency).

In the following the individual subjects are described in detail. Information on competencies promoted was analyzed with attention to characteristics within a subject. For example, competencies that were not or less promoted or competencies that were most promoted.

Teacher Education

All five respondents stated that they promote the competencies outlined in the standards two, three and five which are the following:

- The student finds and accesses needed images and visual media effectively and efficiently.
- The student interprets and analyzes the meanings of images and visual media.
- The student uses images and visual media effectively.

The majority of respondents stated that they promoted principles of visual design to enable students to design engaging visuals for education. One respondent also stated that students were taught visual design principles with the aim to develop and utilize graphic and projection materials to engage future students in positive, productive learning. A second practitioner supported critical thinking towards visuals, the analysis of visual elements and the composition of visuals and multimedia 'texts'. Students discussed techniques presented in graphic novels such as color, placement, and size to manipulate/direct viewer's attention. A third educator reported on developing meta-language associat-

ed with visual, written and multimodal texts. Students developed knowledge about a range of text types. This included visual and written text features and how these work together to make meaning. Students discussed how layout and design shape meaning in multimodal texts by annotating key visual features. This teacher also asked students to take photographs using shot distance, angles and gaze to emphasize visual grammar choices. A fourth respondent reported on a course in the field of instructional technology that taught principles of visual design such as layout, balance, chunking, simplicity, etc.

Visual Arts

Four of the 22 valid responses were related to the discipline of visual arts. The competencies outlined in standard seven were promoted by none of the four respondents. Standard seven reads as follows:

- The student understands many of the ethical, legal, social, and economic issues surrounding images and visual media.

One respondent stated that students were expected to be able to consume and produce visuals in a deliberate and critical way. The participant explained that the institution offered an interdisciplinary minor in digital literacy and multimedia design. These courses were studio based or in discussion/lecture format. A second educator reported on doing bibliographic instruction in art/film or other courses requiring images for assignments. This instruction was part of information literacy education which now includes images and media. Specific resources used for teaching were ArtStor, digital collections and the discovery tool Primo. A third participant stated that projects using multimedia resources instead of papers were used in teaching. This included media such as video, audio, simulations, games, and maker spaces with 3D printing capabilities.

Journalism and Media Studies

Two practices were related to journalism and media studies. Both participants stated that competencies as outlined in the standards three, four and five were promoted. These read as follows:

- The student interprets and analyzes the meanings of images and visual media
- The student evaluates images and their sources
- The student uses images and visual media effectively

One respondent taught photojournalism and reported that students are required to understand and interpret journalistic photographs. The other educator was engaged in media and cultural studies and promoted film analysis, visual culture studies, and video production. This combined visual and cultural theory and practice which usually began with key readings and written analyses of visual media, and culminated in media production exercises in a theoretical and critical context. Students were required to develop analytical skills pertaining to the analysis and interpretation of visual media such as film, photography, television, web-based multi-media, digital and art-installation.

Biology

The practitioner in biology stated to support all competencies outlined in standard one to seven. The participant required students to understand conventions scientists use when representing the unseen molecular world or representations of experimental research data. Students decoded visual material and identified concepts related to the material. The educator used CRM and MACH models as well as problem sets in teaching.

History

The history educator didn't promote competencies outlined in standard six and seven which read as follows:

- The student designs and creates meaningful images and visual media.
- The student understands many of the ethical, legal, social, and economic issues surrounding images and visual media.

A history exercise involved students in reading and interpreting photographs as historical texts. As introduction students learned to read a variety of different kinds of historical primary sources such as illustrations and photographs. Later students were required to use historical photographs as sources to support their historical arguments in papers. The educator referred students to K. Martinez's typology of ways historians tend to use visuals: (1) illustration, (2) interpretation, and (3) illumination.

Linguistics

One practice was stated to be undertaken in linguistics. The competencies outlined in standard one and two were indicated to be not supported. These read as follows:

- The student determines the nature and extent of the visual materials needed.
- The student finds and accesses needed images and visual media effectively and efficiently.

According to the participant the objective was for students to become critical consumers and producers of visual texts. Many of the assignments were multimodal in nature. These required students to make use of images as well as print to represent their ideas. Much of the visual literacy work also involved working with digital software programs such as Photoshop, Comic Life, iMovie, etc.). Another course of this practitioner taught how to read multimodal texts like graphic novels.

Practices across Subjects

The majority (three out of four) reported that competencies outlined in standard one were not promoted. This read as follows:

- The student determines the nature and extent of the visual materials needed.

One respondent reported that visual literacy efforts were institution-wide and took place in the humanities, social science, and sciences alike. The aims of the work were to 1) enable faculty members to incorporate assignments or redesign courses that prompt students to express ideas visually or use visual forms of evidence in argumentation, 2) realign institutional resources (e.g. the library, writing center, math skills center, and IT organization) to more effectively support work relevant to working with visual assets, and 3) ensure professional development for faculty and academic professionals to better align their expertise with visually rich practices. The participant reported on several activities including: courses and assignments dedicated to staging exhibits; broader adoption of critique sessions frequently used in studio art courses; open labs during which faculty, librarians, and experts in visual rhetoric hold office hours for students in courses that have visual literacy assignments; and workshops for faculty and students on copyright and on the tools suited to a given assignment (e.g. video, image, or infographic creation).

A second respondent indicated that visual literacy education wasn't a specific program but a cross-curricula competency present in all subjects such as arts education, sciences, mathematics, history, and language learning. Aesthetic education was considered as a core competency and 3D technology, image technology, visual charts and aides, electronic white boards were used for teaching. A third educator stated that visual literacy skills are integrated into teaching and learning of various subject areas such as English, science, math but are not explicitly taught. In other words, it rested with the individual teacher whether or not visual literacy competencies were developed as part of formal

teaching. Aids used for teaching were web-based software such as mindmeister, voice thread, digitation, and glogster.

The fourth respondent taught a course on multiliteracies. One of the objectives in the course was: (1) define and give examples of multiple forms of literacy and text across modes (form) and genres (purpose) for a range of audiences as they are used in school and other settings. Visual literacy was encompassed in this objective. One specific activity that was used to help students read visuals such as film required them to watch the short film "More" by Mark Osborne. This film had no words and students relied heavily on the visuals to understand the film and generate meaning. The first time, students watched the film and were asked to make general observations. They shared these with a single partner and then the entire class. Afterwards, students were given a handout that listed symbols that occur in the movie. They watched the film again and identified what the symbols meant, where it occurred in the film, and what visual cues were present - this led to another whole class discussion. Finally, students were given different questions that focused on critical analysis and theme. They watched the film once more and worked together to answer the questions.

3.2.2 Academic Library Practices

Four practices were undertaken by academic libraries. Half of them (two out of four) stated that competencies outlined in standard two and six were not promoted:

- The student finds and accesses needed images and visual media effectively and efficiently.
- The student designs and creates meaningful images and visual media.

One respondent stated that visual literacy is integrated into information literacy instruction. The second participant also tied visual literacy into information literacy objectives which included for one to identify information needs (use the research process, construct a research question with a man-

ageable focus, differentiate and apply different types and formats of information (scholarly/popular, primary/secondary, etc.). With regard to visuals students were required to determine if images, videos, graphs or charts were needed to illustrate statements in their research papers or presentations. The educator created a video to help the students understand the research process and how to pick a topic. In addition, students were supposed to critically reflect on the topic rather than only to summarize the information. The second objective was to find information effectively (demonstrate how information is organized, use Boolean Logic and other search strategies to effectively use library catalogues, article databases, and Internet search engines). Resources such as ARTstor, Flickr, and Wikimedia Commons were introduced as well as search techniques for image searches. The educator showed how to find information necessary to cite images and copyright information including creative commons licensing. The third objective was to critically evaluate information (identify and apply evaluation criteria to assess the quality of information retrieved). The practitioner, for example, conducted an image search for Mona Lisa and showed students how images vary in terms of color, quality, and in terms of content. Here, image quality was considered as most important for selection. Further charts, graphs and videos were discussed as well as the advantages and disadvantages using these visual materials. The fourth objective was the ethical information use (demonstrate the importance of properly and correctly citing a source used. Identify what constitutes plagiarism and how to avoid it). Students were asked to practice citing images, graphs and videos. The participant stated students more likely use visual materials in their research papers or presentations if those know how to cite correctly. The educator also showed videos from students, professors, and librarians to introduce the differences between high school and college level research.

The third respondent stated that students were required to deal with the issues of copyright and intellectual property associated with the distribution, use, and production of visual images. Students evaluated the quality of images that had been reproduced from an original work. This included the following activities: (1) students must locate images from a variety of sources (not just one); (2) stu-

dents must evaluate the quality of the image based on other iterations, if possible; and (3) students must locate the rights information for the image and must include this as a component of citing the image. A research guide for this class and assignment helped students to answer these questions.

The fourth respondent stated that in library instruction, visual literacy is most often related to the need to search for and cite images. Students were also taught how to find Creative Commons or public domain images. Additional competencies promoted were: (1) finding images using advanced search features to narrow image choices; (2) downloading images; (3) identifying copyright issues associated with images; (4) citing images; (5) use technologies to work with images, such as Power-Point, iMovie, and Photoshop; and (7) incorporating images into multimedia presentations. The library held subscriptions to some image databases, such as ARTstor and taught common image web tools such as Flickr.

In summary, the survey findings revealed that visual literacy was often aligned to information literacy efforts. The competencies most promoted by the survey participants were for students to understand ethical, legal, social, and economic issues surrounding images and visual media. The survey findings revealed that librarians promoted the critical evaluation of information and the ethical use of information including issues of copyright and intellectual property. Half of the survey participants (2 out of 4) promoted to find information effectively. The competencies less promoted as indicated by the survey participants were design and creation of meaningful images and visual media. One survey participant stated that the use of technologies was supported.

3.2.3 Stated Mission

21 cases were analyzed to reveal whether visual literacy education is a stated mission of the institution. The majority of 17 participants indicated that visual literacy education is not a stated mission of their institution. Four responded with yes. The one case that indicated that there was no affiliation to either university/faculty or academic library was not included in analysis (see 3.2 Results, p.53).

Half of the respondents specified their selection. Many indicated that visual literacy is included in the learning goals of some academic departments and is integrated into courses. One respondent stated that dedicated visual literacy courses are offered. Another participant reported that visual literacy is related to the core objective of building effective multimedia communication skills. A third respondent stated that even though the term visual literacy is not used in the curricular requirements several requirements were directly related to those activities associated with visual literacy in the ACRL definition. The other half of the participants indicated that there is no specific reference or policy regarding visual literacy in their mission statement. One participant stated that efforts were made to involve the department in teaching visual literacy. However, the curriculum was still text oriented.

3.2.4 Collaboration between Universities/faculties and Academic Libraries

21 cases were analyzed to reveal whether universities/faculties collaborate with academic libraries in teaching visual literacy competencies to students. The one case that indicated that there was no affiliation to either university/faculty or academic library was not included (see 3.2 Results, p.53). The majority (12 participants) indicated that institutions were not collaborating across university.

Some of the respondents specified their selection. Collaboration between faculty members and librarians was experienced as valuable when working on visual literacy assignments and projects. One

librarian pointed out that “this has more to do with staffing and specialty than anything else. Because I and other academic librarians at my institution are interested in visual information literacy education, a number of our academic faculty members are aware of this connection and call on us to help enhance their assignments, instruction, etc.” Hence the personal interest of one person can encourage others. Students were taken to the library to do visual projects and the library supplied equipment such as cameras and tablet computers to students. Further, libraries offered training and guidance for faculty on incorporating visuals and media in their teaching. However, not just collaboration across university was done, also museums, art galleries and technology companies were mentioned.

3.2.5 Challenges Experienced

The minority of five respondents found teaching visual skills to student’s easy or not very challenging. The participants indicated that students are aware of the importance and relevance of visual literacy and perceive visual literacy activities engaging. The majority with 17 cases, however, found it difficult or somewhat challenging to teach visual literacy competencies to students. Of the 22 cases 21 responded to the question and indicated issues that challenged visual literacy education.

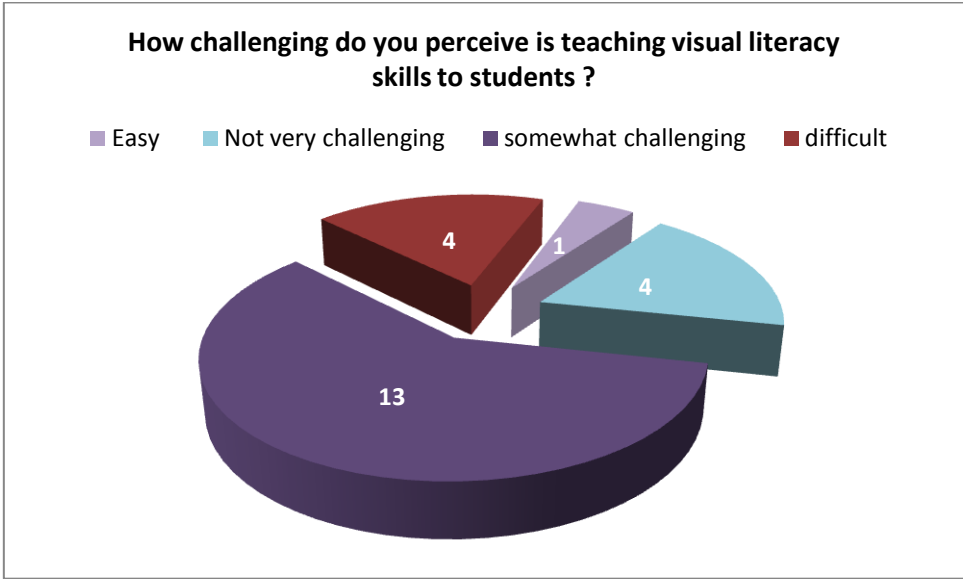


Figure 6. How challenging do you perceive is teaching visual literacy skills to students?

Several respondents stated that additional efforts and limited resources caused most challenges. Visual literacy education was integrated as added activity that supplemented primary course content as specific courses on visual literacy were missing. One participant argued that “visual literacy is often not considered a discipline, which implies limited resources.” Another issue was the time affordance necessary as it “takes lots of time to prepare and present visual information.” However, “trainers” needed to be appropriately trained themselves and invest time to learn about design, image copyright and basic technologies. This was complicated as recent technological approaches such as new software and apps are available and skills constantly need to be updated and referring to one respondent “visual education is just one part of my job!”

Some participants indicated that most visual literacy work started from very basic knowledge as students commonly did not possess previous expertise in visual literacy. For example, they weren’t taught to think about visuals critically or to evaluate them with respect to quality and accuracy. In addition, the lack of wider background knowledge including art, humanities, and liberal arts understanding impeded teaching visual literacy competencies. A few participants specified that assessing multimedia assignments was experienced as challenging as “effective synthesis and own production of any visual message is a very complicated process and thus its evaluation is complex.” Therefore evaluation was typically omitted from the agenda and assessment rarely examined visual literacy. Another participant stated that it was hard for faculty to evaluate multimedia assignments. Many visual literacy projects were team-based making individual assessment even more difficult.

Two participants indicated that student’s assumptions towards visual literacy can hinder their education. One respondent argued that students had positive pre-assumptions towards their own visual literacy competencies. The participant stated that this meant to make students first recognize what they don’t know or can’t do before it was possible to help them develop their visual capacities. Another challenge was to make students aware of the importance of visual texts as “for them, a texts

consists of only print.” One respondent stated that for some of the more advanced competencies, such as the ethics and interpretation, it was up to the course instructor to develop these further, not to the librarian.

3.2.6 Factors of Success Experienced

All participants responded to the question what in their experience make visual literacy education successful. Several respondents stated that their education benefited from the universal relevance of visual literacy as “visual literacy is all around.” Visual literacy skills can be applied to a wide variety of human endeavors and students enjoyed working with visual materials. The participants experienced visual literacy education as successful if students understood its importance and deliberately applied their knowledge and skills as critical consumers of visuals in society. Further, if students understood the dimensions of visuals displayed in media, learned to comprehend visual conventions and utilize visual approaches to communicate effectively in their own media productions. One respondent stated that students should think about visuals as information, cultural or otherwise, that is subject of copyright and has to be cited for research papers and presentations. One respondent stated that it is essential to help students to “deliberately develop the capacity to look closely, carefully, slowly, and critically.” Another argued that an expanded understanding of a multimodal text is crucial because it helps students to make the transfer from print literacy to visual literacy more easily.

Others argued that visual literacy training should be an integrated part of the academic curriculum. One respondent stated that “visual rhetoric is very powerful in this day and age. Preparing students to effectively critique and produce visual materials is a critical element of their academic preparation.” Practices can be successful when incorporated into as many projects as possible and integrated “throughout a learner's academic experience in a variety of contexts.” The behaviors of the visually literate must be tested, applied, and improved in a variety of situations. Some stated that university

should open up to the various possibilities which teaching visual literacy has to offer. According to one respondent it is vital to support faculty with audiovisual equipment so that multimedia resources can be incorporated in teaching and learning. One respondent stated that faculty should be provided with support to assign, assess and appreciate visual literacy based assignments. In addition, faculty should be provided with copyright clearance so educators can use and share visuals. Further, “better teacher education would improve the incorporation of visual literacy.” Two respondents indicated that collaboration between faculty and libraries as a factor of success. However, the survey findings indicated that solely 9 out of 21 universities, faculties or academic libraries collaborate across university.

3.3 Results and Discussion

This section explains in which respect survey results and literature correspond. It has to be noted that participants of the survey were identified by looking at authors having published in the field of visual literacy practices in higher education. Due to the nature of the sample it is quite probable that participants who were asked to contribute to the survey were in fact also authors of the literature reviewed. Therefore findings of both data collection approaches are not directly contrasted but supplement each other according to the research objectives to reveal trends and patterns.

3.3.1 University/faculty vs. Academic Library Practices

Both literature review and survey findings revealed that visual literacy practices in higher education were mainly undertaken by universities/faculties. University/faculty practices were presented with 18 out of 22 in the survey and with 43 out of 49 in the literature.

3.3.2 Visual Literacy Practices and Universities/faculties

The majority of visual literacy practices undertaken by universities/faculties were related to a specific subject considering the course content or the affiliation of the author. Subject-specific practices were presented with 14 out of 18 in the survey and with 37 out of 43 in literature.

Some practices could not be related to a specific subject. The majority of these practices were either applied to a variety of subjects or visual literacy was aligned to other literacy practices. One practice of the survey combined visual literacy with multiliteracy efforts and three of the practices in literature with information literacy efforts. This is a relative small amount of practices that aligned visual literacy with related literacies. The literature findings indicated that 3 out of 43 practices were associated to related literacies in university/faculty and 1 out of 18 practices in the survey.

Visual literacy competencies were most promoted by the subject (preservice) teacher education and visual arts. (Preservice) teacher education was present with nine practices in literature and five practices in the survey. However, it has to be noted that the field of instructional technology was integrated in this category teacher education with two practices found in literature and one in the survey. Visual arts were present with nine practices in literature and four practices in the survey. These subjects were followed by the subject linguistics with eight practices in literature and one practice in the survey. Other subjects present in both data collection approaches included biology, journalism, media and communication studies, and history with one or two practices each. In the following the individual subjects are further discussed.

Teacher Education

Both data collection approaches revealed that (preservice) teacher education promoted visual design principles. (Connors, 2012; Sosa, 2009) Further, educational technology was introduced to enable students to create visually effective products that can be utilized for classroom instruction (Flynt & Brozo, 2010; Kovalik & Williams, 2011; Wilhelm, 2005).

Visual Arts

Activities in visual arts were mainly undertaken in art courses and film studies. Both data collection approaches revealed that multimedia played an important role in visual arts education. The survey findings indicated that various formats of multimedia were promoted in classrooms focusing on design and use of visuals (Chung, 2007; Eber & Wolfe, 2000) or used web-based teaching (Abrahmov & Ronen, 2008; Carpenter & Cifuentes, 2011). This was also observed by Stankiewicz (2004, p. 88) who argued that “art education has a special relationship with technology.” However, the literature review also revealed that visual arts focused on studies of popular visual culture. Students examined social and cultural issues such as embedded ideologies, values and interpretations mediated through visual media. (Carpenter & Cifuentes, 2011; Chung, 2005, 2007; MacDonald, 2010; White, 2012) This was not specifically mentioned by the survey participants. The respondents indicated that the least promoted competencies were for students to understand many of the ethical, legal, social, and economic issues surrounding images and visual media.

Linguistics

One survey participant was related to the discipline linguistics. According to the participant the objective was for students to become critical consumers and producers of multimodal texts such as graphic novels. This was also observed by looking at the literature. In the field of language education

several authors used multimodal texts and analyzed visual evidence used for communication. (Kutch, 2014; Mathews, 2014; Seglem & Witte, 2009).

Journalism, Media and Communication Studies

The survey revealed that visual media analysis and production was promoted by the participants. This was also indicated in literature. Pun (2009) taught the persuasive force of visual communication and students created a brand identity for a specific target audience.

History

The survey participant in the field of history required students to become consumers and producers of visuals, in particular to use visuals supporting their historical arguments in papers. This was also pointed out in literature as educators promoted visuals to enable students to use these as historical evidence. (Coventry et al., 2006; Volk, 2015) The one respondent in history pointed out that student were not promoted to design and create meaningful images and visual media and to understand many of the ethical, legal, social, and economic issues surrounding images and visual media by the practice undertaken.

Biology

The one practice related to biology in the survey aimed for students to understand conventions and representations scientists use when representing data. This could also be observed in literature. Students were taught how the visualization of scientific phenomena can serve as an effective knowledge-building and communication tool (Schonborn & Anderson, 2010; Takayama, 2005). The practitioner in biology stated to support all competencies outlined in standard one until seven.

Practices across Subjects

Practices that were not related to a specific subject were commonly either applied to a variety of subjects or practices were related to information literacy efforts. This could also be observed in literature. A number of authors aligning visual with information literacy (Abilock, 2008; Harris, 2010; Hassett & Schieble, 2007) and others reported on practices performed across subjects (Nixon et al., 2008; Palmer, 2015). The majority (three out of four) survey participants reported that students were not supported to determine the nature and extent of the visual materials needed.

3.3.3 Visual Literacy Practices and Academic Libraries

The survey findings revealed that visual literacy was often aligned to information literacy efforts. This was also observed when analyzing the literature. Some practitioner combined visual and information literacy efforts (Harris, 2007; Hoover, 2011). Other authors also noticed that visual aspects of information are increasingly incorporated in information literacy instruction. (Hattwig, Bussert, Medaille, et al., 2013; Ravas & Stark, 2012)

The competencies most promoted by the survey participants were for students to understand ethical, legal, social, and economic issues surrounding images and visual media. This could also be noticed by looking at practices undertaken by academic libraries. The survey findings revealed that librarians promoted the critical evaluation of information and the ethical use of information including issues of copyright and intellectual property. In literature these issues were often taught (Harris, 2007; Hoover, 2011; Ravas & Stark, 2012) The study by Ravas and Stark (2012) also revealed that many librarians taught ethical and legal aspects of image use.

Half of the survey participants (2 out of 4) promoted to find information effectively. The other two respondents stated that they do not promote students to find and access needed images and visual

media effectively and efficiently with the individual practice undertaken. The literature analysis also found that half of the practitioners (3 out of 6) emphasized the support to find images effectively (Harris, 2007; Hoover, 2011; Rybin, 2012). This is in contrast to Ravas and Stark (2012) who found out that the most common type of instruction related to images was teaching students and faculty how to find images.

The competencies least promoted as indicated by the survey participants were design and creation of meaningful images and visual media. This was also apparent in the study undertaken by Ravas and Stark (2012) who observed that few participants said they assisted with the design aspects of image use, such as placement and color.

One survey participant stated that the use of technologies, such as PowerPoint, iMovie, and Photoshop was supported. The use of editing software (Palmquist, 2008; Rybin, 2012) and technology such as wordcloud (Huisman et al., 2011) was also promoted by practices found in literature.

3.3.4 Challenges

In summary, a great majority of participants found teaching visual competencies difficult or somewhat challenging. Several issues were identified as impeding the teaching process. For one, visual literacy education was integrated as added activity into courses and this required teachers to invest additional efforts and time. They had to find time to educate themselves, which was particularly challenging as technological approaches required skills to be constantly updated. These issues were also indicated by several reviewed authors. (Metros & Woolsey, 2006; Nixon et al., 2008) Some participants indicated that students commonly did not possess previous knowledge towards visual literacy or wider background knowledge towards visuals which intrinsically slowed down the learning process. This was also stated by Emanuel and Challons-Lipton (2013) who observed that students have

no wider background knowledge towards visuals. A few respondents indicated that assessing multimedia assignments was experienced as challenging. These assessment difficulties were also mentioned in literature. (Metros & Woolsey, 2006; Nixon et al., 2008)

3.3.5 Factors of Success

In summary, several respondents stated that their education benefited from the universal relevance of visual literacy. Education was successful when students deliberately applied their knowledge and skills as critical consumers of visuals in society. Some argued that visual literacy training should be an integrated part of the academic curriculum. This was also stated in literature. (Metros, 2008; Metros & Woolsey, 2006) However, the survey findings revealed that only 4 out of 21 institutions had a reference towards visual literacy in their mission statement. Only, one respondent stated that courses specifically in visual literacy are offered. Few respondents indicated that visual requirements are included in learning goals of some academic departments and is integrated into courses. Another participant reported that visual literacy is related to the core objective of building effective multimedia communication skills. Further, it is vital to support faculty with appropriate audiovisual equipment for teaching and learning. This was also indicated by some authors who stated that adequate budget for visual resources and technology to facilitate visual activities is essential. (Mayer & Goldenstein, 2009; Metros, 2008) Two respondents indicated that collaboration between faculty and libraries is a factor of success. The importance of communicating and collaborating with departments on campus was also mentioned by several authors. (Harris, 2010; Hattwig, Bussert, Medaille, et al., 2013; Mayer & Goldenstein, 2009; Metros & Woolsey, 2006; Rybin, 2012) The survey results indicated that 12 out of 21 institutions collaborated across university. Collaboration between faculty members and librarians was experienced as valuable when working on visual literacy assignments and projects. Library offered training and guides for faculty on incorporating visuals and media in teaching and lent equipment such as cameras and tablet computers to students.

4. Conclusion

The final chapter summarizes the main findings in regard to the individual research objectives by taking into consideration both findings from the literature analysis and the survey. Furthermore, limitations that potentially impact the research findings and suggestions for future research are pointed out. Finally, the chapter ends with a conclusion and recommendations towards visual literacy practices in higher education.

4.1 Conclusion towards Research Questions

This section gives conclusions towards the research questions based on data gathered through both literature analysis and survey.

Research Questions 1

Do universities/faculties promote visual literacy competencies?

The research revealed that visual literacy practices are undertaken by universities/faculties. Moreover, a great majority of practices can be associated to universities/faculties.

What practices are undertaken by universities/faculties?

Across disciplines the same practices were frequently observed. Practitioners supported scholarly/professional imaging practices, improved the use of images and visual media in students own work, and facilitated the use of digital technology to create images and visual media. Some practitioners taught persuasion and argumentation of visual messages using media such as advertising. Multimodal texts like graphic novels were regularly used to teach students how to analyze aesthetic and rhetoric elements in texts. Other practitioners used technology to promote visual literacy com-

petencies among students including web-based teaching and online discussions. Practitioners also aligned visual literacy efforts with related literacies such as information literacy. Few practitioners promoted creative thinking skills by the visual literacy practice undertaken, mainly in visual arts.

Are visual literacy practices undertaken by universities/faculties related to a specific subject?

A great majority of practices carried out in universities/faculties were related to a specific subject. Of these the disciplines linguistics, (preservice) teacher education and visual arts promoted visual literacy competencies the most. Practices were categorized considering course content or the affiliation of the author. However, both authors of literature reviewed and survey participants frequently stated that practices can be applied to a wide range of subjects. This fact can also be observed when looking at the research findings. Across disciplines same practices occurred.

Do specific subjects promote particular visual literacy competencies?

In general, all practitioners required their students to become critical consumers and producers of images and visual media. Critical thinking was promoted by self assessment using tools such as question sheets or group critiques where students collectively reflected on images and visual media.

All practitioners across subjects promoted students abilities towards the analysis and interpretation of images and visual media. However, variations between science education including astronomy, biology and biochemistry, and other subjects could be observed. Science educators asked students to analyze, interpret and understand visuals in regard to the process of visualization. Other subjects focused on the analysis and interpretation of visuals with attention to rhetoric elements such as intended meaning, argument and persuasion as well as aesthetic elements including design principles. The study of visual design principles was most promoted in the disciplines visual arts, (preservice) teacher education and linguistics.

Practices that were not related to a specific subject supported the evaluation of images and visual media with attention to reliability and accuracy. This might be reasoned in the fact that some practices included in this category aligned visual literacy with information literacy efforts.

The use of images and visual media in projects was also promoted across subjects. This competency was connected to the ability to create effective visual presentations. In science (astronomy, biology and biochemistry), however, students created, visualized and experimented with visual concepts of scientific phenomena. All other subjects created visual media for example, by using digital tools such as editing software. The use of technology was most promoted in the visual arts, linguistics and (preservice) teacher education while the latter promoted technology to communicate course content.

In the following the most represented disciplines are described in more detail.

Biology and Biochemistry

Biology and biochemistry educators emphasized the role of visualization as knowledge-building and communication tool. These supported competencies related to the visualization process of scientific phenomena. Students were required to analyze and interpret visuals, to use visuals effectively and to create, visualize and experiment with visual concepts.

History

History educators promoted visual literacy to enable students to use visuals as historical evidence. Students were asked to interpret and analyze images and visual media and to understand embedded visual historical proof. Furthermore, students were supported to use images and visual media effectively as historical arguments in multimedia presentations. One survey respondent pointed out that

the least promoted competency was for students to understand many of the ethical, legal, social, and economic issues surrounding images and visual media.

Journalism, Media and Communication Studies

Journalism, media and communication teachers supported aspects of visual communication. Students were required to interpret and analyze images and visual media. A marketing professional, for example, taught persuasion and argumentation of visual communication and students designed a visual representation of a marketing idea. The survey revealed that most promoted competencies in this area were the interpretation and analysis, the evaluation and the use of images and visual media.

Linguistics

Linguistics mainly supported visual literacy competencies in the subject's composition studies and language education. Language education mostly used films and graphic novels for language development. The objective was for students to become critical consumers and producers of multimodal texts. Students were asked to analyze, interpret and understand visual evidence. Educators introduced modes of visual expression to make students understand visual communication. Furthermore, students were asked to use technology and to create images and visual media themselves. Composition studies emphasized visual communication in regard to argument and persuasion as well as document design. Practitioners in this subject promoted students to analyze, interpret and evaluate rhetoric and aesthetics elements of images and visual media. Further, students learned how to use images in projects and how to create documents that include visuals effectively. The one survey participants related to linguistics reported that to determine the nature and extent of visual materials needed and to find and access needed images and visual media was not promoted.

Teacher Education

Teacher education was mainly concerned with (preservice) teacher education. Educators taught visual design principles and the use of technology for enhanced classroom instruction. Students were required to interpret, analyze and understand intended messages of visuals and to create visuals that can communicate course content. The survey revealed that the visual literacy competencies promoted the most were to find and access, to interpret and analyze images and visual media and to use visual materials effectively.

Visual Arts

Activities in visual arts were mainly undertaken in art courses and film studies. Multimedia played an important part in visual arts education. Various formats of multimedia were promoted in classrooms focusing on use, design and creation of visuals. Educators support students to interpret and analyze visual design elements and to evaluate intended messages conveyed by images and visual media. Further, students created and designed visuals using technology such as editing software. Classroom content commonly focused on social and cultural issues mediated through visual media. Students were required to detect, analyze and interpret embedded ideologies, values and interpretations of popular visual culture. The survey participants indicated that the least promoted competencies were for students to understand many of the ethical, legal, social, and economic issues surrounding images and visual media. Furthermore, educators used online discussion and web-based teaching to enhance visual literacy abilities.

Practices across Subjects

Practices that were not related to a specific subject were commonly either institution-wide in scope, were applied across subjects or practices were related to information literacy efforts. Educators required students to analyze, interpret and evaluate visuals with attention to intended message, reliability and accuracy. Further, the effective use of images in projects and the use of technology such as

editing software were taught. The survey participants indicated that students weren't promoted to determine the nature and extent of the visual materials needed.

Research Questions 2

Do academic libraries promote visual literacy competencies?

Academic libraries promoted visual literacy competencies. However, compared to the vast amount of practices undertaken in universities/faculties, libraries seemed to be less engaged. A minority of practices were undertaken by academic libraries.

What practices are undertaken by academic libraries?

Librarians often aligned information and visual literacy efforts. Activities facilitated the access to visual resources by introducing databases and search engines. Students were promoted in locating images, evaluating and selecting images, and the ethical use of visual materials including copyright and citation. Furthermore, the use of technologies and digital tools such as editing software, web tools and cameras was supported.

Do academic libraries promote particular visual literacy competencies?

More than in universities/faculties, librarians promoted students abilities to find and access images, to evaluate images with attention to accuracy and reliability as well as the ethical use of visual information. The competencies less promoted as indicate by the survey participants were design and creation of meaningful images and visual media.

Research Questions 3

What challenges are experienced by practitioners?

Several issues were indicated to impede the teaching process. Educators had difficulties in mastering media types, information sources and tools associated with visual materials, especially as visual literacy is dynamic and technology constantly evolves. Visual assignments were experienced to be time consuming for educators and students alike. Furthermore, practitioners had difficulties to evaluate and assess student's performances. Libraries were challenged to secure funding for image resources and facilities for visual media production.

What are factors that make visual literacy education a success?

Several authors stated that successful integration of visual literacy education requires changes to institutional core values and visual literacy requirements need to be integrated into curricula. Educational strategies need to include visual learning goals, outcomes and assessment. This would require the commitment of both the college or university's top leadership and the academic community. Furthermore, the authors suggested that academic communities should share their teaching and learning experiences with others. Particular interesting were educational and assessment strategies as well as models of collaboration across university/faculty and library.

The authors explained that budget needs to be provided to offer appropriate learning spaces, visual resources and tools for multimedia activities. Furthermore, an enhanced support structure and assistance from support professionals that have expertise with visuals is essential. Support needs to be provided to faculty members and students as these may not find the time to learn about the multiplicity of information sources and tools associated with visual materials. It was also stated that librarians should participate in discussion with teachers and students to reveal how libraries can best serve potential needs towards visual literacy teaching and learning.

4.2 Limitations

One potential limitation of the findings is the strong bias towards practices undertaken in English speaking countries. Almost all survey participants came from the United States of America and just publications in English were analyzed. Due to language barriers the research focused solely on literature published in English. This also impacted the survey results as almost all survey participants were found by looking at visual literacy practitioners who had published in the English language. However, this limitation can be overcome by future research that looks at practices published in other languages. Further, by applying purposive sampling which includes the country of practice as value. This would make the findings comparable across countries.

A second limitation that impacts the findings is that survey participants and authors of the literature reviewed coincide. Due to the specific sample necessary, namely visual literacy practitioners, the range of potential survey participants was relatively small. Information essential to identify visual literacy practitioners in higher education was gained by looking at practitioners that had published in the field under study. This was a useful way to find a relatively large amount of potential survey participants in a short time. Surveys commonly have a low response rate and as many participants as possible needed to be asked to contribute to the research. However, this limitation could be overcome in future research by applying another strategy of finding survey participants. For example, individual universities could be examined whether they teach visual literacy competencies and associated practitioners asked to contribute to the research.

Finally, another limitation that potentially impacts the survey findings is that interpretation and evaluation of research data was undertaken by just one author. Analysis generally requires at least two researchers, who analyze, compare and discuss findings, thus strengthen the reliability of the results.

4.3 Recommendations

Both universities/faculties and academic libraries supported visual literacy practices in higher education. Yet, a great majority of practices were undertaken by universities/faculties and these practices were mainly subject-related. Education was mostly undertaken by subject teachers who carried out additional efforts to integrate visual literacy teaching. However, across subjects similar practices were frequently observed and only slight variations were detected. Moreover, several practitioners stated that the practices proposed can be applied to a wide range of subjects. This raises the questions which competencies should be taught by subject-specialist and which competencies could be taught across subjects? Last but not least, visual literacy education was experienced to be time-consuming and each educator had to learn and teach the multiplicity of media types, information sources and tools associated with visual materials. An interdisciplinary approach towards visual literacy education, however, might alleviate these issues.

Practices that were not related to a specific subject often aligned visual and information literacy efforts. This alignment might be of advantage as both literacies share common learning outcomes. The ACRL Visual Literacy Standards, for example, was developed in the context of the ACRL Information Literacy Competency Standards for Higher Education. (Association of College and Research Libraries, 2000) Some practitioners already have developed practices that combined information and visual literacy learning outcomes. (Abilock, 2008; Harris, 2010; Hassett & Schieble, 2007) Yet, research findings towards university/faculty practices revealed that solely three out of 43 in literature, and one out of 18 practices in the survey aligned information and visual literacy efforts. Librarians also aligned information and visual literacy practices.

In contrast to text resources visual materials require additional levels of interpretation and analysis. Also, the use of images and visual media has a particular relationship with technology and digital media. (Association of College and Research Libraries, 2011) Therefore, it might not be a surprise

that the most promoted competencies across disciplines corresponded to these requirements. All subjects aimed at enhancing students abilities towards analysis and interpretation of images and visual media as well as the effective use of visuals.

Nelson (2004) stated that visual literacy education, in particular advanced competencies such as ethics and interpretation is most effectively done in connection with discipline-specific content. However, many subjects applied similar teaching strategies. Interpretation and analysis of visuals was commonly undertaken paying attention to rhetoric elements such as intended meaning, argument and persuasion as well as aesthetic elements including principles of visual design. Visual aids used for teaching mostly were films, advertising and multimodal texts such as graphic novels. These common features could be an indication of teaching practices than can be applied across subjects. For example, visual literacy workshops that teach basic skills towards rhetoric and aesthetic visual elements could be developed. Subject educators could “outsource” the teaching of basic skills towards visuals and instead focus on subject specific assignments in classroom.

Furthermore, the use of images and visual media in projects was promoted across subjects. This competency was connected to the ability to create visuals using multimedia tools such as editing software. Here, workshops promoting the use of digital tools could be ideal. Subject educators then could build on a stronger foundation of students basic skills and provide subject-specific assignments.

However, exceptions were present in the subjects astronomy, biology and biochemistry all of which examined scientific phenomena. Educators and students required specific knowledge of visual conventions - therefore competencies might best be taught by subject specialists.

Academic libraries can play an important role in supporting academic communities to enhance visual literacy education. Research findings revealed that academic libraries taught competencies which were less or not promoted by universities/faculties. In particular, the ability for students to understand the many ethical, legal, social, and economic issues surrounding images and visual media was less fostered in universities/faculties. In contrary, libraries commonly supported students in the ethical use of visual materials including copyright and citation.

Academic libraries facilitated the access to visual resources by introducing databases and search engines. Students were supported in locating images, evaluating and selecting images. Furthermore, academic library practices supported the use of digital tools such as editing software, web tools and cameras. These are essential skills necessary for the academic community as oftentimes assistance mastering media types, information sources and tools associated with visual materials is needed. However, the competencies less promoted in academic libraries were design and creation of meaningful images and visual media. Hence, librarians could teach basic skills towards the use of technologies whereby the creation and design of meaningful visuals might be done in subject courses at university/faculty. However, budget for academic libraries is essential to provide appropriate access to visual resources, equipment and facilities for multimedia instructions. A first step for libraries might be to promote visual resources on campus to overcome resources unawareness and to provide instructions on image technologies and tools to overcome discomfort with technology.

In summary, the findings of the presented research suggest that a number of general analysis and interpretation competencies may well be taught across subjects. These might include knowledge towards rhetoric and aesthetic elements of visuals. Basic visual literacy skills could be taught by support professionals that have the necessary expertise in the field. Subject educators could then build on basic competencies and apply these to subject assignments. Further, academic libraries could advertise services in regard to information sources, offer instructions on the reliable and accurate

use of images and visual media, and teach basic skills towards digital technology associated with visual materials. Here, collaboration and an enhanced support structure between universities/faculties and academic libraries is essential.

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6. Appendix



Visual Literacy Practices in Higher Education

What visual literacy practices do currently exist in higher education?

Please take a few moments to fill out this survey on visual literacy practices in higher education.

The objective of the study is to identify existing activities undertaken by universities and academic libraries and what visual competencies are promoted. Further, the study aims to discover challenges and factors of success experienced during the process of teaching visual literacy to students.

The results of this survey will be published in my MA thesis and your answers will be kept confidential. Thank you for your participation!

Completing this questionnaire will not take more than 20 minutes.

Please complete this questionnaire before Sunday, April 26th 2015.



Visual Literacy Practices in Higher Education

Visual Literacy defined

In this study visual literacy is defined following the definition by the Association of College and Research Libraries (2011) which reads as follows:

"Visual literacy is a set of abilities that enables an individual to effectively find, interpret, evaluate, use, and create images and visual media. Visual literacy skills equip a learner to understand and analyze the contextual, cultural, ethical, aesthetic, intellectual, and technical components involved in the production and use of visual materials. A visually literate individual is both a critical consumer of visual media and a competent contributor to a body of shared knowledge and culture."

Association of College and Research Libraries (2011). *ACRL Visual Literacy Competency Standards for Higher Education*. Retrieved April 9th, 2015 from <http://www.ala.org/acrl/standards/visualliteracy>



Visual Literacy Practices in Higher Education

Academic institution associated

* 1. Please specify the academic institution the visual literacy practice can be associated.

- University/faculty
- Academic library
- Other (please specify)



Visual Literacy Practices in Higher Education

Academic institution associated

* 2. In general, is visual literacy education a stated mission of your institution?

Yes

No

N/A

3. Please specify, your previous selection.



Visual Literacy Practices in Higher Education

Visual Literacy practices

The survey is conceptualized to ask questions associated to one activity and the competencies promoted by the individual practice. If you would like to contribute information about more than one activity, please repeat the survey.

Please describe the individual educational practice which promotes student's visual literacy competencies in your institution.

* 4. Aims and Objectives - please specify

* 5. **Educational program** - please specify the steps and activities undertaken during the teaching process.

* 6. Teaching aids & devices - please specify any materials, techniques, or media used to assist in the educational process.

Visual Literacy Practices in Higher Education

Competencies

The competencies suggested are taken from the ACRL Visual Literacy Competency Standards for Higher Education developed by the Association of College and Research Libraries (2011).

Please check all that apply.

* 7. What competencies are promoted by undertaking the individual practice?

- The student determines the nature and extent of the visual materials needed** (e.g. defines the need; identifies sources, materials, and types)
- The student finds and accesses needed images and visual media effectively and efficiently** (e.g. selects appropriate sources and retrieval systems; conducts effective searches; acquires and organizes images and source information)
- The student interprets and analyzes the meanings of images and visual media** (e.g. identifies information relevant to its meaning; situates its cultural, social, and historical contexts; identifies the physical, technical, and design components; interprets and analyses through discourse with others)
- The student evaluates images and their sources** (e.g. evaluates the effectiveness and reliability as visual communications; evaluates the aesthetic and technical characteristics; evaluates textual information accompanying; makes judgments about the reliability and accuracy)
- The student uses images and visual media effectively** (e.g. effective use for different purposes; effective use of technology; uses problem solving, creativity, and experimentation for incorporation into scholarly projects; communicates effectively with and about it)
- The student designs and creates meaningful images and visual media** (e.g. produces visual materials for a range of projects; uses design strategies and creativity in production; uses a variety of tools and technologies for production; evaluates personally created products)
- The student understands many of the ethical, legal, social, and economic issues surrounding images and visual media** (understands the ethical, legal, social, and economic issues surrounding; follows ethical and legal best practices when accessing, using, and creating; cites in papers, presentations, and projects)
- Other (please specify)



Visual Literacy Practices in Higher Education

Academic discipline

* 8. If applicable, please specify the academic discipline the individual visual literacy activity can be associated.

General training, please specify

Subject-specific training, please specify

Others, please specify



Visual Literacy Practices in Higher Education

Success and Challenges

* 9. How challenging do you perceive is teaching visual literacy skills to students?

Easy

Not very challenging

Somewhat challenging

Difficult

N/A

* 10. Please specify what made you choose your rating.

* 11. Please indicate factors which in your opinion make visual literacy education a success.



Visual Literacy Practices in Higher Education

Collaboration

* 12. Does your university collaborate between faculties and academic libraries in teaching visual literacy competencies to students?

Yes

No

N/A

13. Please specify, in what way the institutions collaborate.



Visual Literacy Practices in Higher Education

Country

* 14. Please indicate the country the individual visual literacy practice is taken place.

Visual Literacy Practices in Higher Education

Thank you for your participation!

15. Do you want to get informed about the study results? Please indicate your email address.

My study results will be published not later than June 2015.



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