IMPROVING MEDIA LITERACY AMONG 10-15 YEAR-OLDS USING IMAGE ANALYSIS

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Abstract

According to German surveys conducted in 2014 almost all (98%) 10 to 15 year-olds have access to smart phones or digital cameras. Motivated by the availability of mobile devices and Internet connectivity, and with the spread of online social network sites (SNS) and cloud services, more and more of the photos they take are published online. The enabling means have become an integral part of the "digital natives"' lives. Their natural media use, though, is opposed to a lack of awareness for possibilities and impacts of image processing, online data exploitation, for potential risks and their responsibility in dealing with photos online. In this paper we propose a novel interdisciplinary approach for children and adolescents from age 10+ using image analysis to improve their media literacy, raise awareness for possibilities, risks and consequences and to encourage them in dealing responsibly with pictures online. The overall idea is to confront them with their online "naked" self, which is done by developing and utilizing a software tool – *The Profiler*. *The Profiler* retrieves their online available pictures, analyzes them using state of the art image processing algorithms and finally aggregates the information to create person profiles of them. Furthermore, we present first results from this ongoing joint work, such as first findings of a survey conducted with 900 pupils in Vienna, a concept for the image profiling software tool and lessons learned so far.

Keywords: Media Literacy, Image Analysis, Youth Research, Interdisciplinary Research and Education, Social Network Services, Affective Image Processing, Privacy, Image Profiling

1 INTRODUCTION

According to the KIM 2014 (Feierabend, Plankenhorn, & Rathgeb, 2015) and JIM 2014 (Feierabend, Plankenhorn, & Rathgeb, 2014) surveys evaluating children's and adolescents' media use in Germany from almost all (98%) 10 to 15 year-olds have access to mobile/smart phones or digital cameras, either as a separate or as part of a mobile device. They take pictures of events, everyday-life experiences, of objects, pets, friends, family and themselves. Motivated by the availability of mobile devices and Internet connectivity, and with the spread of online social network sites (SNS) and cloud services, more and more photos are published online, which is reflected in vast amounts of pictures in SNS:

The enabling means have become an integral part of the "digital natives"' lives (Feierabend et al., 2014, 2015; Livingstone, Haddon, & Görzig, 2015). Their natural way of using media devices and SNS, though, is

opposed to a lack of awareness for possibilities and impacts of image processing, online data exploitation, for potential risks and their responsibility in dealing with photos online: Once published, pictures can spread rapidly and uncontrollably and are almost impossible to remove. Examples for critical side effects are "sexting" or "cyberbullying": upsetting and in worst case leading victims to substance abuse, depression or suicide (Rice et al., 2014; Schuster, 2011; P. K. Smith et al., 2008) - the impact of such trends and the lack of awareness for a responsible handling of data online can be manifold and might be drastic (Sacco, Argudin, Maguire, & Tallon, 2010; P. Smith, Mahdavi, Carvalho, & Tippett, 2006; van Geel, Vedder, & Tanilon, 2014). Still, many children and adolescents consider their behavior as unproblematic.

Approaches to overcome this situation focus on media literacy education, whereas media literacy is a vague term and various different attempts exist to define it (Gapski, 2013). Following Baacke it comprises instructional and goal-oriented dimensions – media criticism/media studies and media design/media use (Baacke, 1996). Schiermann similarly describes media literacy as a holistic combination of competences referring to the design, to the use and handling as well as to a sophisticated criticism of socio-technical media- and IC-technologies (Schiersmann, Busse, & Krause, 2002). As a consequence, educating pupils in media literacy can be a way to empower them with knowledge, skills and competences to responsibly and critically produce, use and reflect media and IC technologies and to raise awareness for potential risks and consequences in addition to its possibilities.

Related Work

School education draws on this by having objectives for media literacy education included into the curricula (see (Bundesministerium für Bildung und Frauen, 2013, 2015) as examples for Austria), which take into account all dimensions as defined by Baacke or Schiersmann. Children's an teenagers' media use, in particular within the context of risks and dangerous trends, as well as encouragements and strategies to protect or empower children and teenagers in the online world have been research hot topics on an international level, see e.g. (Finkelhor, 2014; Lievens, 2014; Meier & Bhat, 2008; Staksrud & Lobe, n.d.). In the context of SNS and legal aspects Buttarelli, the Assistant European Data Protection Supervisor, emphasizes the need to educate children as early as possible about a respectful dealing with information and privacy of themselves and others and about their responsibility and legal rules in the online world (Buttarelli, 2010)In practice, projects and initiatives have been developed and implemented to address the topics. To not exceed the scope of this paper the geographical focus of the examples described below is put on Austria and Germany:

In Austria, e.g. *Mediamanual*[1] is an interactive platform for active media relations by the Federal Ministry for Education and Women. As an interface and communication platform it provides information, lectures, workshops and support for teachers and projects around the general topic of "media". The team research and develop teaching and learning processes and documents as well as knowledge-production networks and they provide options to European pupils to present their projects and media productions with the aim to encourage a reflective and responsible use of media. One example focuses on the discussion of the online personality of Internet users[2] and encourages a critical perspective on virtual identities, roles and behaviors as well as privacy aspects online.

Another Austrian initiative is *Saferinternet.at* lead by the Austrian Institute of Applied Telecommunications (OIAT) in cooperation with Internet Service Providers Austria (ISPA). Its aim is to support Internet users, particularly children and teenagers, in developing a safe use of digital media. Activities of the initiative are for examples providing websites, workshops and support services, free school resources and networking with relevant players and journalists. SaferInternet also offers workshops, presentations, school projects and conferences for pupils, parents, teachers, social workers, etc. in Austria[3]. It is co-funded by the Safer Internet Programme of the European Commission[4], the Austrian Federal Ministry for Families and Youth[5] and industry sponsors. It is a member of the European network of Awareness Centres "*Ins@fe*"6, which is promoting safe, responsible Internet and mobile devices use among young people as part of the "Strategy for a Better Interne for Children"7. *SaferInternet.at* provides Q&A, recommendations, material and multimedia content to various topics related a responsible use of Internet and new media as well as users'

[1] http://www.mediamanual.at/ accessed 08/2015
[2] http://www.mediamanual.at/mediamanual/leitfaden/medienerziehung/lehrplan/ost/ost_031.php accessed 08/2015
[3] https://www.saferinternet.at/veranstaltung-buchen/ accessed 08/2015
[4] https://ec.europa.eu/digital-agenda/en/creating-better-internet-kids accessed 08/015
[5] http://www.bmfj.gv.at/ accessed 08/2015
[6] http://www.saferinternet.org/ accessed 08/2015
[7] http://ec.europa.eu/digital-agenda/en/creating-better-internet-kids accessed 08/2015

responsibility and potential risks, such as cyberbullying, digital games, data safety, mobile devices, online-shopping, internet and sexuality, privacy, copyright, virus, spam and online fraud. Similarly to mediamanual.at, they also encourage a critical reflective analysis of online self-presentation by user-profiles in SNS. In contrast to our approach, they though use "Fake" profiles in "Fake" SNS as basis for discussions and don't limit their focus on digital images.

Bildungsserver "Medienkompetenz macht Schule" ("Media literacy goes school")[8] is a program by the government of Rheinland Pfalz, Germany addressing the developments and changes in the media landscape by improving media literacy following a 10 points program. The primary focus is on pupils at schools from elementary school onwards and on encouraging the use of new media in schools by forcing the expansion of media-related infrastructure and by providing advanced training for teachers. It additionally focuses on a tight integration of parents and provides different educational materials to be used in school lessons, initiates pilot projects and is active in partner networking.

Similarly to our work, the *Sparkling Science* research project „Netkompass"[9] is positioned in the area of conflict emerging from the possibilities, chances and the problematic aspects of the Social Web. The interdisciplinary project approach was to develop an information platform[10] for adolescents centered on the topics of privacy and data protection Social Webs. Following the Sparkling Science Programme objective the platform is developed and implemented in a close cooperation between scientists and pupils with the latter being actively engaged in the research and development phases. Awareness is raised during the project for the involved students by hands on experience in creating informative material on the topic for peers and through stepping into the role of being didactical designers. Following similar overall aims and being positioned in the same general topic the approaches and means used are rather different. Whereas in Netkompass the approach is to develop multimedia information material about privacy and data protection in the Social Web and make it available for the public, this work has a clear focus on images online and their automatic analysis and uses these research fields and the technological means and applications as basic approach motivation.

The ongoing Austrian Sparkling Science research project *InMeLi*[11] coordinated by the University of Vienna, Faculty for Philosophy and Education has the objective to research the Media Habitus of young people and to let young people experience, reflect and consciously handle it in order to evaluate and improve their own media literacy. This is done by pupils 'active participation in the research project, concretely by involving them in developing a media habitus test in cooperation with the scientific team and by working out exercises together with the teachers for its application in course of school lessons. As this work InMeLi focuses on a critical reflection of pupils' media use and to improve them in media literacy. This is though done using the different approach by letting them develop a test evaluate their media literacy and to reflect their own Media Habitus, whereas in this work the focus is put on digital images in social media and by commonly developing and applying a software tool, which confronts them with their own online self-representation.

Scope of this Paper

In this paper we propose a novel interdisciplinary approach addressing the need for media literacy education among pupils. This is done using the context of personal pictures published in the Internet and the technological possibilities of image analysis. The main objective is to raise children's and teenagers' awareness for possibilities, risks and consequences and encourage them in dealing responsibly with pictures online through empowerment and hands-on-experience. At the same time they also train goal-oriented media-literacy skills through active participation as junior scientists in a research project.

The remainder of this paper continues as follows: In Section 2 the interdisciplinary approach of *The Profiler* is presented and further discussed in the subsections from didactical, sociological and technical perspectives. In Section 3 we present selected implementation details followed by first results in Section 4. The paper concludes with a discussion and lessons learned after the first nine months of this ongoing two-years project (Section 5) and an outlook to future work (Section 6).

[8] http://medienkompetenz.bildung-rp.de/gehezu/startseite.html accessed 08/2015
[9] https://www.sparklingscience.at/en/projects/show.html?--typo3_neos_nodetypes-page%5Bid%5D=692 accessed 08/2015
[10] http://www.netkompass.at accessed 08/2015
[11] https://www.sparklingscience.at/de/projects/show.html?--typo3_neos_nodetypes-page%5Bid%5D=816 accessed 08/2015

2 THE PROFILER CONCEPT

This project combines state of the art research and development of the fields of informatics and sociology as well as education (see Figure 1) to educate media literacy by confronting digital natives with their own bare online-self based on image information.

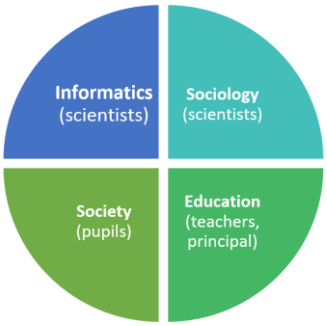

Figure 1: Structure of the interdisciplinary project team

2.1 Sociological Research

Research is conducted following a mixed methods approach to research the pupils' media use with focus on SNS and digital images as well as their awareness (see project objectives). This includes a quantitative survey using an online questionnaire which is enrolled at the whole school (i.e. first to eighth grade pupils) and later on offers the possibility to extend it also to other schools. Furthermore, qualitative research methods such as group discussions and interviews are implemented in each one class of the first and of the fifth grade to gain more detailed and in-depth insights. The classes were selected according to the findings from the German surveys KIM and JIM (Feierabend et al., 2014, 2015) that at an age of 10 to 11 years children there is a jump in the frequency, duration of use and activities undergone in the Internet. At the age of 15 to 16 years the teenagers are already actively, extensively and independently using the Internet and social media applications.

2.2 *Profiler* Software Tool

The fundamental objective is to raise awareness by confronting the pupils with their "bare" online self using a Profiler software tool. The concept includes the development and application of this software for the aforementioned confrontation with the pupils' online image-based self-representation: It acquires personal images related to the user ("target person") from selected online resources and performs a comprehensive image analysis for personal facial attributes on each of them. These results are aggregated to form a profile-style description of the user, which is visualized on the web-browser and can also be downloaded and printed. The workflow of this software described in detail below and visualized in

Figure 2*:*

Figure 2 the Profiler software workflow: Creating person profiles from online personal pictures using image analysis and synthesis for facial attributes

1. Image Acquisition: A picture pool related to a target person (the user) is established. From selected online resources, such as different SNS and search engines images are retrieved.
2. Image Analysis: All acquired pictures are in the first step analysed if they contain one or more faces. If there is no face in the picture, it is ignored for the further analysis. For every face detected, a

detailed image analysis is performed comprising age and gender classification and emotion recognition. Optional, also meta-information retrieved from SNS may be taken into account.

3. Image Profiling: In the Image Profiling step the results from the Image Analysis are synthesized and aggregated to create detailed descriptions of the target person. Furthermore, also meta-information retrieved from SNS can be taken into account to enhance the level of detail of the descriptions.
4. Wurstify: The application "Wurstify.me[12]" is integrated, which adds a beard to every detected face based on the detection of facial key-points (so-called face landmarks).
5. Profile Visualization: The aggregated data is visualized using a person profile similar to a police record style to the users and can be saved and printed for further use.

Due to its modular architecture the software tool allows for the extension of the image analysis and profiling features, to also e.g. consider ethnicity of the persons or to analyse their SNS-based friendship-network or allow for interactive exploring of different analytical detail levels.

The application of *The Profiler* comprises two major steps: A workshop with utilization of a prototype with basic functionality during the development phase and later on the application in a workshop with the final software with full functionality combined with workshops about technical, legal and impact assessment aspects.

2.3 Methodological Project Characteristics

The implementation of the concept comprises the following characteristics:

School Project

Implementation is done as a project for the pupils: This gives the opportunity to conduct several workshops or workshop days to focus on the subtopics rather than having to squeeze the tasks into lessons of 50 minutes each. The project work is flanked with workshops for the junior researchers covering a variety of topics related to the project, such as digital images, legal aspects, SNS, image processing technology and applications, impact assessment, user interface design. On the one hand, they prepare them for their project tasks and on the other hand they carry out the project tasks in the workshops. They also provide them with first-hand base knowledge and insights into state of the art research and in addition, serve as open space for interaction and discussions with the scientists.

During the course of the project the pupils are also invited for an excursion to the university to experience in real life the scientists' work lives and tasks. Suggestions for and mentoring of pre-scientific theses are provided for pupils' of the final grade and interested teenagers are proposed the possibility to participate in a university seminary lecture and to present and discuss their project work to/with undergraduate university students.

Role of the pupils

The key of the project with respect to the implementation methodology is the active participation of the pupils in every project phase. The pupils act as junior scientists and work in cooperation with the scientists. They are involved in every phase of the project to enable gaining insights on how research projects are realized and to comprehensively educate them all facets of media literacy (see Section 1).

Concrete examples for their active participation as junior scientists are, that pupils:

- develop questions for the quantitative survey
- take part in the requirement analysis and scenario design, the user interface design and evaluation of *The Profiler* software
- assist in generating a ground truth for the evaluation of the image analysis algorithms
- present their work online and at events to their peers and to the public

Through this holistic project approach including side-events, workshops on related topics, practical development, testing and exercising with the profiling software, they learn and improve their media literacy skills using an experience-based and learning-by-doing driven approach. Furthermore, they have the unique opportunity to participate as active junior researchers working with together scientists on a topic of high relevance for their everyday lives and their futures.

[12] http://wurstify.me accessed 08/2015

3 IMPLEMENTATION

This implementation of the joint work focuses on the one hand on the online questionnaire as part of the sociological research and on the other hand on the image analysis functionality of the software development to describe personal details from faces in images.

3.1 Image Analysis

The starting point of any face analysis of a person is face detection in a scene whereas face detection algorithms are designed to detect one or more faces in images and to return their respective sizes and positions (Yang, Kriegman, Member, & Ahuja, 2002). Challenges for the face detector are, e.g. objects (partially) covering the face, low image quality, varying environmental conditions, such as illumination or shadows. These complications are common in online available images, as they are taken “in the wild”, i.e. in unconstrained settings. After successful detection the faces can be used for further analysis of facial attributes, such as face recognition and age, gender or emotion estimation.

The task of classifying a person’s gender is an autonomous process in image-based face analysis, and thus usually performed in parallel to other classifications, which allows for a faster comprehensive analysis. However, the results of different performed estimations can be used to affect each other, e.g. example faces with classified genders can be filtered so that a face recognition is only performed in a target category (Akbari & Mozaffari, 2010).

Table 1 Examples of the Action Units from the Facial Action Coding System (P. Ekman & Friesen, 1977)

AU	Description	Facial muscle(s)
1	Inner brow raiser	Frontalis, pars medialis
2	Outer brow raiser	Frontalis, pars lateralis
4	Brow lowerer	Depressor supercilii, corrugator supercilii
5	Upper lid raiser	Levator palebrae superioris
6	Check raiser	Orbicularis oculi, pars orbitalis
7	Lid tightener	Orbicularis oculi, pars palpebralis
12	Lip corner puller	Zygomaticus major
15	Lip corner depressor	Depressor anguli oris/triangularis
23	Lip itghtener	Orbicularis oris
26	Jaw drop	Masseter, relaxed temporalis and internal pterygoid

Emotion recognition aims at estimating the mood of a person in an image. The main difficulty in emotion prediction from a single image is that a facial expression does not show one identifiable emotion as Ekman and Friesen (Paul Ekman & Friesen, 1975) describe. For affective image analysis e.g. the Facial Action Coding System method can be utilized: After a face pose estimation and localisation of key landmarks, e.g. mouth edges or eyebrows, every visible movement of a facial muscle is assigned to an Action Unit (AU) resulting in a total number of 46 such AU’s (examples see Table 1). Emotions can then be predicted by combining certain AU’s, which are involved in the facial expression of the respective emotion (examples see Table 2).

Table 2 Examples of the Emotional Facial Action Coding System (Friesen & Ekman, 1983)

Emotion	Action Units
Happiness	6 +12
Surprise	1 + 2 + 5 + 26
Sadness	1 + 4 + 15
Anger	4 + 5 + 7 + 23

Age estimation is a current research area and even for humans it is sometimes challenging to assume the correct age of a person (Fu, Guo, & Huang, 2010). For automated age classification a semi-supervised

technique is applied. This approach uses a training set to learn information of age describing features and tries to estimate the age on the basis of the learnt information.

3.2 Online Questionnaire

Preceding the project pre-survey was conducted orally and open in course of a lesson with one class of each the first and the fifth grade at GRG23 Draschestraße. This provides a first estimation for the relevant SNS and online communication tools of the target users and serves as input for the development of the online questionnaire as well as for the software development.

The quantitative survey has been implemented using an online questionnaire and it was carried out in spring 2015 at GRG23 Draschestraße in all classes of the first to eight grades. Relying to the results of the related studies from Germany (see Section 1) and based on the insights during the first discussion with the pupils about SNS and their media use, two slightly different questionnaires for first to fourth and fifth to eight grade pupils have been developed with the first one containing only a subset of questions as of the second. The shorter questionnaire e.g. does not include detailed questions about different SNS and self-reprentation online as considering social media they use mostly smartphone-based messenger for communication rather than SNS. A further reason for the short questionnaire is due to the maximum time for accomplishment of the survey is one lesson per class and considering that the younger pupils are not yet as experienced with computers and thus more time is needed compared to the older pupils for logging in and out to/of the network, accessing and navigating through the questionnaire. Each class was supervised while filling out the questionnaire by one teacher, who also supported the pupils in cases of difficulties navigating through the questionnaires or understanding questions or used terms.

4 RESULTS

The results of this joint work can be divided with respect to the involved scientific fields. They include insights and lessons learned concerning the cooperation in the interdisciplinary consortium, the quantitative survey as well as the software tool development and prototype.

4.1 Sociological Survey

A total of 953 pupils of the age between 10 to 19 years at the Viennese Secondary Academic School GRG23 Draschestraße accomplished the online questionnaire. Almost all (98.7%, n=953) of the pupils own a cell/smart phone, almost three out of four have their own computer or laptop and 40% (n=953) own a tablet. Access mainly via mobile/smart phones, or via computer/laptop at home.

Concerning SNS and online communication applications, Whatsapp[13] (smartphone-based messenger application, Youtube[14] (online video portal) and Instagram[15] (a service to publish and share images) followed by Snapchat[16] (smartphone-based messenger for photos which adds an expiry date to every so-called “snap”) and Facebook[17] (“classical” online social network service) are the most used ones by the pupils, whereas Whatsapp seems to be the alternative for SMS and SNS-integrated Chats, such as the Facebook Messenger. The SNS are mainly used to interact with peers rather than adults. Questions about their virtual friends-network compared to their social network in the real world revealed, that more than seven out of eight (n=901) pupils know their internet contacts also from real life (friends or peers), but more than a quarter are known only from the Internet.

Concerning publishing and sharing pictures online, 73% (n=886) have uploaded photos of themselves in SNS and two out of five published videos or photos of friends. Half of the pupils share details about their hobbies, other activities and their age, whereas from the latter the majority (82%) states their correct age. One third of the pupils answered that they either often or sometimes have been tagged in photos without prior consent. Referring to cyberbullying, almost one fifth knows someone who was been bullied.

Concerning awareness it already can be stated at this point, that less than half of the pupils (n=624, this question was part of the questionnaire for fifth to eighth grade pupils) regularly use security or privacy settings in SNS. This confirms the hypothesis of a lack of awareness for their responsibility and for potential risks and consequences from dealing with their images online.

[13] http://www.whatsapp.com accessed 08/2015
[14] https://www.youtube.com/ accessed 08/2015
[15] https://instagram.com/ accessed 08/2015
[16] https://www.snapchat.com/ accessed 08/2015
[17] https://www.facebook.com accessed 08/2015

4.2 The Profiler Software

The following functionality has been implemented or integrated for *The Profiler* prototype:

- Image acquisition using Google Custom Search Engine[18], Facebook and Instagram
- Image Analysis: algorithms for age, gender and emotion classification and a first prototypical implementation for person recognition based on clustering
- Wurstify (see Figure 3)
- Basic and age-appropriately designed user interface to interact with the tool through a web-browser with images visualizing and explaining the processing steps of the software
- Framework, webserver and database for browser-based access, internal data processing and handling, visualization and connection to the web, etc.

Figure 3 Example the "wurstification" of a person in an image

4.3 Workshops and Excursions

Workshops were held concerning the topics of sociological research and quantitative research methods as well as active discussions about SNS and their media use. Furthermore, one class of the fifth grade visited the Computer Vision Lab (CVL) at the Vienna University of Technology for an excursion. In three different stations they got interactively presented ongoing research projects. They also were introduced into the work life of scientists at the lab, how research is done and took advantage of the opportunity to discuss with the members of the CVL about these topics as well as to get questions related to the project and other science topics answered from first-handed by experts.

5 DISCUSSION AND LESSONS LEARNED

One major lesson learned throughout the workshops has been that the active participation of the pupils and teachers in all project phases is crucial for the project success:
Most prominently, this is reflected in an “age gap” between the scientists (age 30+) and the pupils (age 10-15) concerning the used language and terminology referring to Internet and social media. For example, the term “forum” is rather unknown for the pupils. Furthermore, “chatting” and “writing back and forth” between peers or sending SMS’ is used similarly. Also the difference between synchronous (e.g. chatting) and asynchronous (e.g. email) communication has not been clear. The reason for this is seen in their media use and the ubiquitous Internet and smartphone availability, which promotes and eases asynchronous communication anyway.
Without actively having involved the target audience of the questionnaire, the questionnaire would have lacked an easy, age-appropriate and understandable wording. This would have led to an increased need for support during the accomplishment and to a higher number of invalid submissions.

Another factor for the project success is the common project planning of scientists and teachers in the project pre-phase and during the project is crucial for the project success: the project work and time plan have to follow the pupils’ and teachers’ schedules at school as well as the didactical implementation and workshop planning has to be age- and skill-appropriate. Therefore, the teachers’ competences and experiences as well as the fact that they know the pupils’ already directly influences a successful project realization.

The interdisciplinary cooperation also promotes creativity as different perspectives onto the topic can be combined. The structure of the consortium provides a fertile ground to learn from each other. In particular,

[18] https://cse.google.com/cse/ accessed 08/2015

the possibility to work with children and teenagers, scientists get the opportunity to retrieve information and details and see the topics from the young people's perspectives first-handed that would not have been considered nor detected without the active cooperation. On the other hand it opens the way for making science understandable for society.

In course of the workshops and excursions and through the discussions with the scientists about the topics as well as the presentation of project works at the Computer Vision Lab at the Vienna University of Technologies a first raise of awareness can be observed. Pupils have started to consider topics such as privacy and potential "abuse" of technology and engaged actively in discussions and asking the researchers during the excursion about what can be done to their data online, what can be analysed and what could it be abused for or exploited. They also seeked advice from experts and suggestions how to best protect themselves in the online world.

The findings show that, Internet, online communication and image sharing are substantial parts of the pupils' everyday lives and confirmed a deficient awareness for their responsibilities and potential impacts in context of their online behavior. Though, during the course of the joint project so far first indications for a successful raise of awareness for privacy, responsible handling of images and data online has been observed.

6 CONCLUSION

In this paper we presented a novel interdisciplinary approach to improve media literacy among children and teenagers of age ten to fifteen years using the context of pictures in Social Media and image analysis. Furthermore, first results of the its implementation as a research and school project area outlined, such as the software prototype, concerning the sociological research and learned lessons, with particular focus on the interaction and experience in working and researching in cooperation with pupils.

The next steps in this joint work are the testing of the prototype and its application in a school workshop covering topics, such as user interface design, image processing basics and legal aspects in addition to the exercising with *The Profiler* tool. Based on this and a first user test the profiler final version is to be developed and then applied as part of a project day at the school along with workshops focusing on further details on the topics above, privacy and copyright, and a thorough impact assessment and project reflection. The detailed evaluation of the online questionnaire is to be done and the survey is considered to be extended to further Austrian schools. Extensive dissemination activities are carried out in close cooperation with the pupils, which include a.o. the presentation of their work and the project at the open school day or to their peers and parents as well as in local media.

7 ACKNOWLEDGEMENTS

This research was partially funded by the Austrian Federal Ministry for Science, Research and Economy as part of the Sparkling Science project "The Profiler" (Grant NO. SPA 05/089; project logo see Figure 4). The authors also thank Univ.Prof. Dr. Natalia Wächter and Dr. Christiane Atzmüller from the University of Graz for their input on the sociological project aspects.

Figure 4:
The Profiler project logo

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