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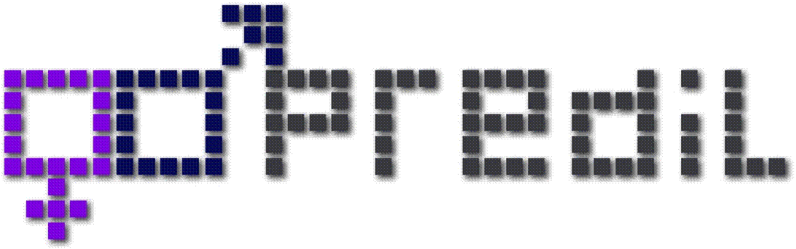

PREDIL
Promoting Equality in Digital Literacy

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ANALYSIS OF RESOURCES
GERMANY

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SUMMARY

This document reports the results of an analysis of learning and teaching materials for informatics lessons at secondary school level in Germany. The analysis included materials for pupils – to be used during lessons, as well as materials for teachers – didactical materials and for teacher education. Further, a differentiation between offline (books, journals) and online (electronic resources, web portals) was made.

The analysis focused on the identification of gender aspects in the materials, e.g. the share of male and female expressions in texts, and the share of males and females described to be performing an activitiy or to be in a leading position. Also, pictures with people were considered regarding the number of males and females shown on it and how many of them were illustrated as beeing in a leading position.

Research shows that women do feel less addressed by texts with a majority of male expressions, and a reproduction of stereotypical socialisation processes is supported through explicit and implicit statements about gender in teaching materials (see Chapman, n.d.; Schneider, 2006; Wiesner et al., 2003). Although the resource analysis at hand can be considered exemplarily only, the results show a clear gender bias in all kinds of materials. In summary, it can be said that both kinds of materials, for pupils and for teachers, show a bias in the frequencies of men and women in texts and pictures.

In consequence, it would be necessary to rethink the quality assurance criteria and processes for the production of learning materials. Not only publishers need to take gender aspects into account, also teachers would need increased awareness for the issue of representing males and females in learning and teaching materials. This is necessary to improve the quality of materials shared with colleagues on internet platforms and also in order to address the issue of gender equality during informatics lessons and while teaching with information and communication technologies. The overal aim should be to support boys and girls equally and with a focus on gender sensitivity, starting with materials that are designed accordingly, and proceeding towards gender reflective teaching practices.

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1 Introduction

School book research is often focused on subjects like history, languages and politics education (see Matthes & Heinze, 2005; www.edumeres.net). However, girls and boys show different interests and self-efficacy in using information and communication technologies (ICT) at school and at home (see Ertl & Helling, in press; Imhof, Vollmeyer & Beierlein, 2007; Initiative D21, 2008; OECD, 2005). Also, the uptake of careers in the ICT sector is subject to gender differences. Women are clearly underrepresented in the ICT professions and at informatics at university (see Briedis et al., 2008; European Commission, 2006). For this reason, the PREDIL project consortium considered it important to analyse the representations of females and males in informatics educational materials, presuming that gender sensitive design of educational materials could have an influence on the teachers' and pupils' perceptions of gender ICT.

Research shows that women do feel less addressed by texts with a majority of male expressions, and a reproduction of stereotypical socialisation processes is supported through explicit and implicit statements about gender in teaching materials (see Chapman, n.d.; Schneider, 2006; Wiesner et al., 2003). Systematic research on school books on national and international level revealed a bias in the representation of men and women to the advantage of men, on a quantitative and qualitative level (see Commonwealth Secretariat, 1995; Paseka, 2004). Similar results were found in our study of the representation of males and females in texts and pictures of secondary level informatics materials in Germany.

Materials related to information and communication technologies (ICT) can be used from two perspectives in the context of school education: either as materials for pupils, e.g. school books and online resources with exercises and tasks to be performed by pupils; or as materials for teachers, e.g. books and online materials which are designed to educate teachers in the application of ICT for teaching and develop their ICT-related didactical competences. Resources that were included in the analysis were online materials, e.g. websites, learning repositories and data bases, and offline materials, e.g. school books and journals.

Schoolbooks in Germany are subject to accreditation processes in some of the Länder. These processes are either managed by the cultural ministry of a state or specific authorities established for this purpose. Due to the structure of Federal System and the educational responsibility of the Länder (Kulturhoheit der Länder) regulations for school book accreditation are not coherent between the Länder. For example, Berlin, Hamburg, Saarland and Schleswig-Holstein do not have an accreditation procedure for school books, in other Länder it is optional, and school books on secondary school level, for vocational education, and for specific subjects are often an exempted from the accreditation process. The current discussion about school book accreditation considers the negative aspects of control and censorship by the state vs. the positive aspects of quality assurance and appropriateness according to predefined criteria (see Stöber, 2010).

According to Stöber (2010) most school laws of the Länder, and complementary decrees, define criteria for accreditation (which should also be considered by authors teachers and schools, if accreditation is not required). These include conformity with the constitution and law, didactical appropriateness, accordance with the curricula, profitability, and in some Länder also absence of serious mistakes, orientation towards

competence standards, and sensitivity in the representation of gender, religion and ethnicity. The school book accreditation act of Baden-Wuertemberg clearly refers to the concept of Gender Mainstreaming as criterion for the content and design of school books (see Schulbuchzulassung, 2007).

School books are considered an important part of teaching processes – although this differs between subjects – and systematic research on school books is conducted on national and international level. However, the focus is often on school books for subjects like history, languages and politics education (see Matthes & Heinze, 2005; www.edumeres.net).

The design of up-to-date school books is challenging in the context of ITG. Koubek (2005) reports this for the issue of influences by ICT on society. The informatics curricula in German schools already allow integrating aspects of informatics and society, e.g. copyright issues. However, these aspects are neglected and the focus is more on technical and mathematical aspects. The need of further education of teachers in this respect is only one problem. Also, only few school books and online resources exist for informatics teaching – often with a lack of didactical concepts which would support the teachers. Special issues, e.g. informatics and society and copy right issues are rather not included. School book publishers do not see economical advantage in publishing books for these topics. This might be related to the fact that contents are outdated too fast in this field.

Education of informatics teachers takes place at universities in Germany. Graduates gain technical and didactic knowledge in informatics. It enables them to design teaching, learning and education processes in informatics. Also, teachers for other subjects, have to acquire certain ICT competences during initial teacher education, e.g. the implementation of media taking into account conceptual, didactical and practical aspects (see Sekretariat der KMK, 2004). The materials used for teacher education of informatics teachers and in the context of media education differ between the German states and also between universities, and refer to informatics issues as well as didactics of informatics and media education.

Offline learning and teaching materials are supplemented with a vast collection of online materials. Most of the informatics online materials for teachers and pupils are freely available on the internet, e.g. provided by the education servers of the Länder or by schools and teachers that see an added value in sharing their materials with other teachers in Germany – however, the materials stand for itself and are hardly interlinked.

In the context of the PREDIL project a resource collection with online materials has been built and is available on the project website. The PREDIL consortium was interested in the quality of these resources from a gender perspective. An exemplary analysis of materials was performed in the countries of the PREDIL partnership. The analysis focused on the identification of (in-)equality in the representation of males and females in texts and pictures. This report presents the results of the German analysis of online resources conducted by the Universität der Bundeswehr München (UniBw) and compares it with results from an analysis of informatics (Informatik) and basic education in information technology (Informationstechnische Grundbildung, ITG) school books.

2 Selection and Structure of Resources

The PREDIL Resource Analysis focused on two types of materials on secondary school level: 1) materials for pupils, e.g. to be used during classes such as exercises for informatics and ICT-related teaching; and 2) materials for teachers, e.g. for teacher training, such as didactical aspects of teaching and learning with ICT and informatics teaching.

Resources that were included in the analysis were online materials, e.g. websites, learning repositories and data bases; and offline materials, e.g. school books and journals. In Germany, the overall number of analysed resource is 29 (see annex 1 for a list of the analysed books and journals, and annex 2 for structured tables with detailed information about all resources)[1].

Resources for pupils

9 offline resources (schoolbooks, for different grades)

The offline resources for pupils were selected on the basis of a literature research conducted by the UniBw. The focus of the research was on materials for the subjects "informatics" (Informatik) and "basic education in information technology" (Informationstechnische Grundbildung, ITG) for upper secondary schools, across several school types and Länder. Ten school books for pupils from different grades and school types have been selected for analysis (two books had the same content, but were named differently, e.g. for use in different states, thus, 9 school books were analysed. From these books, a number of chapters were selected, which represented typical exercises and texts of the book.

10 online resources for pupils (5 online portals, 3 websites authored by informatics teachers/schools, 1 examination rule, 1 competition task)

The UniBw has conducted an internet research of online resources related to ICT/informatics (and gender) at school. The results were collected in the PREDIL Resource Library. 10 resources were selected from this collection: the selection focused on materials for informatics teaching and basic education in information technology, for different grades at lower and upper secondary level, and school types. For partial analysis, the UniBw selected sections which included person expressions in text and examples (as opposed to sections which mainly described formulas, or addressed pupils directly and in imperative without reference to male or female terms).

Resources for teachers

7 online-resources (4 state education severs, 3 online portals/initiatives)

Most of the online materials for informatics and ITG are materials that can be used during lessons (e.g. tasks and exercises, with short didactical background information), and thus were part of the category "materials for pupils". But education servers and

[1] The selection of resources and its chapters/sections/subpages for analysis does not claim completeness or representativeness.

online portals also provide specific information on teaching with ICT, the didactics of informatics teaching, and related gender issues. The number of these portals is limited, and the available offers are often adapted to curriculums of some states only. Often, resources are uploaded by informatics teachers from single schools.

3 offline resources (2 journals, 1 book)

During a literature research of offline teacher materials the UniBw found some didactic books for informatics teaching; however these were hard to get by (e.g. only by inter library loan which was not possible within the timeframe of this study). Thus, the analysis of offline teacher materials focused on the main informatics teacher journal available in Germany: LOGIN (see www.login.de). Additionally, one teacher book was analysed which complemented one of the analysed school books.

3 Statistical Analysis of the Results

The selected materials were analysed for the number of male and female expressions and activities of people described in texts and shown in pictures. The following seven categories were applied to the materials[2]:

- For pictures: men/women in pictures, men/women in leading position
- For texts/descriptions: male/female expressions, men/women as acting persons, men/women in leading positions, neutral expressions.
- The scheme used for the analysis includes also a category named „sexist expressions"; however, this category did not show any impact in the analysis and was not further considered.

The number and percentage of people (women and men) in pictures refers to photographs and drawings which showed any people at all; the total number of pictures in a material might be higher (e.g. if pictures showed animals).

The category "leading position in pictures" was counted for women and men who were shown in a clear leading role (e.g. a doctor as compared to a doctor's assistant) and for women and men which had an active part in a group of people (e.g. speaker/ expert/ active part in a group of people).

In several of the text-based materials male and female forms of words were used equally, e.g. "Die Schülerinnen (female pupils) und Schüler (male pupils) erarbeiten…." This counted for both categories "male expression" and "female expression".

In general, acting persons were identified by a verb which described the activity performed by the person or presented the person as main actor in an interaction of a group of people. For example, the verb "erarbeiten" (to work on) in the above sentence counted for both, "men as acting person" and "women as acting person".

Leading positions in texts were counted for all people which were ascribed a leading role (e.g. doctor as compared to doctors' assistant) and also for people which were described as being the main speaker or expert in certain situations, e.g. if one child explains a subject matter to another child. In some cases, persons in leading positions and active persons were the same, and were counted once in each category.

The following aspects need to be considered in interpreting the results of the analysis: the materials (offline/online for pupils, offline/online for teachers) were analysed by

[2] See annex for an overview of the categories and analysis scheme used in the survey.

four people of the UniBw; the resources were selected exemplarily; the number of teacher offline materials (3 materials) is below that of all other types of materials (9-10 materials).

In the following, the results of the analysis are presented by four graphics for each category (figures 1-5): persons in pictures; leading positions in pictures; male, female and neutral expression in texts; acting persons in text; leading positions in text. Results for pupils' materials are presented in an orange graphic (offline) and yellow graphic (online), and results for teacher' materials are presented in a green graphic (offline) and blue graphic (online). The description of the results is provided in the next section below.

***Figure 1*. Persons in Pictures**

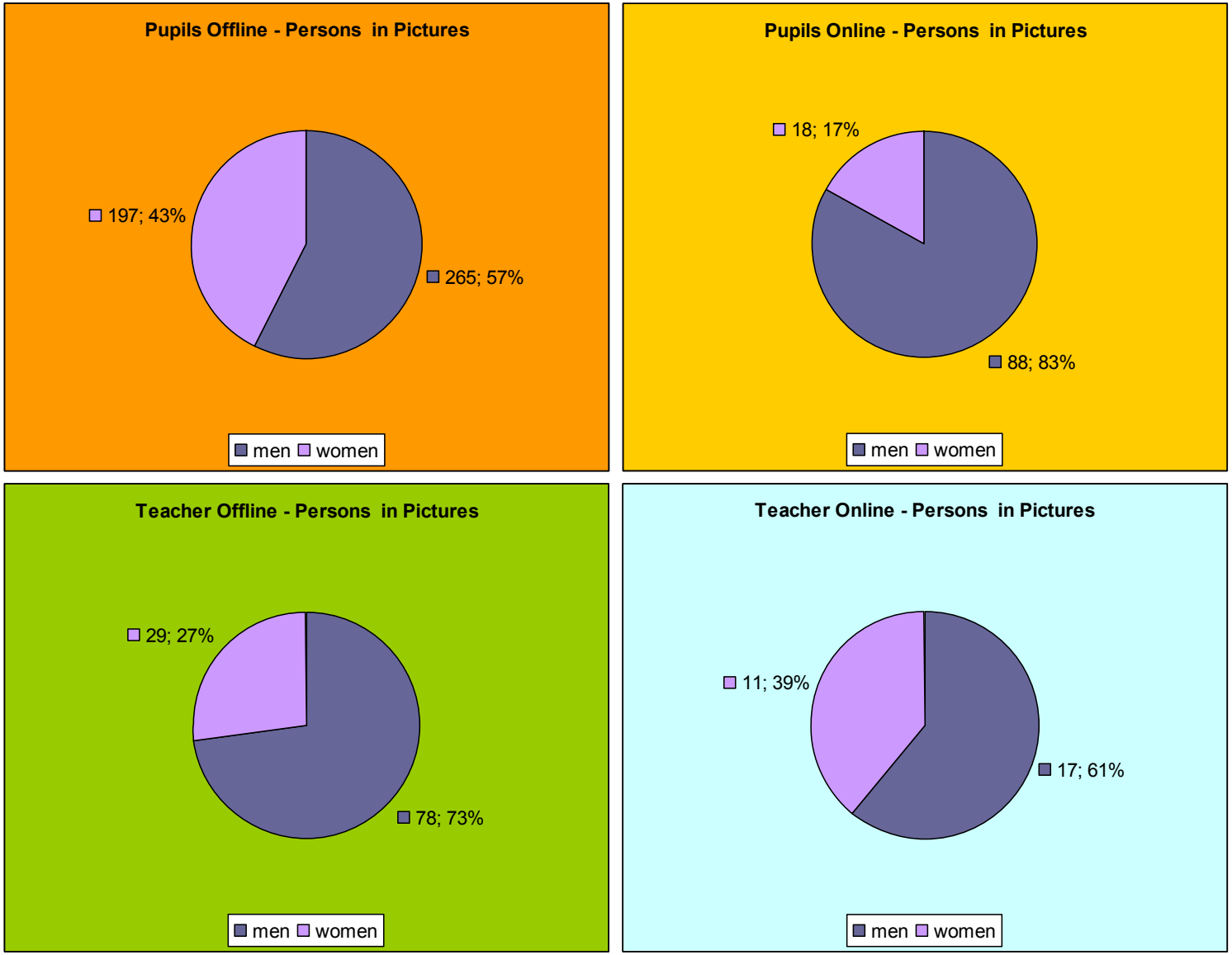


***Figure 2*. Leading Positions in Pictures**

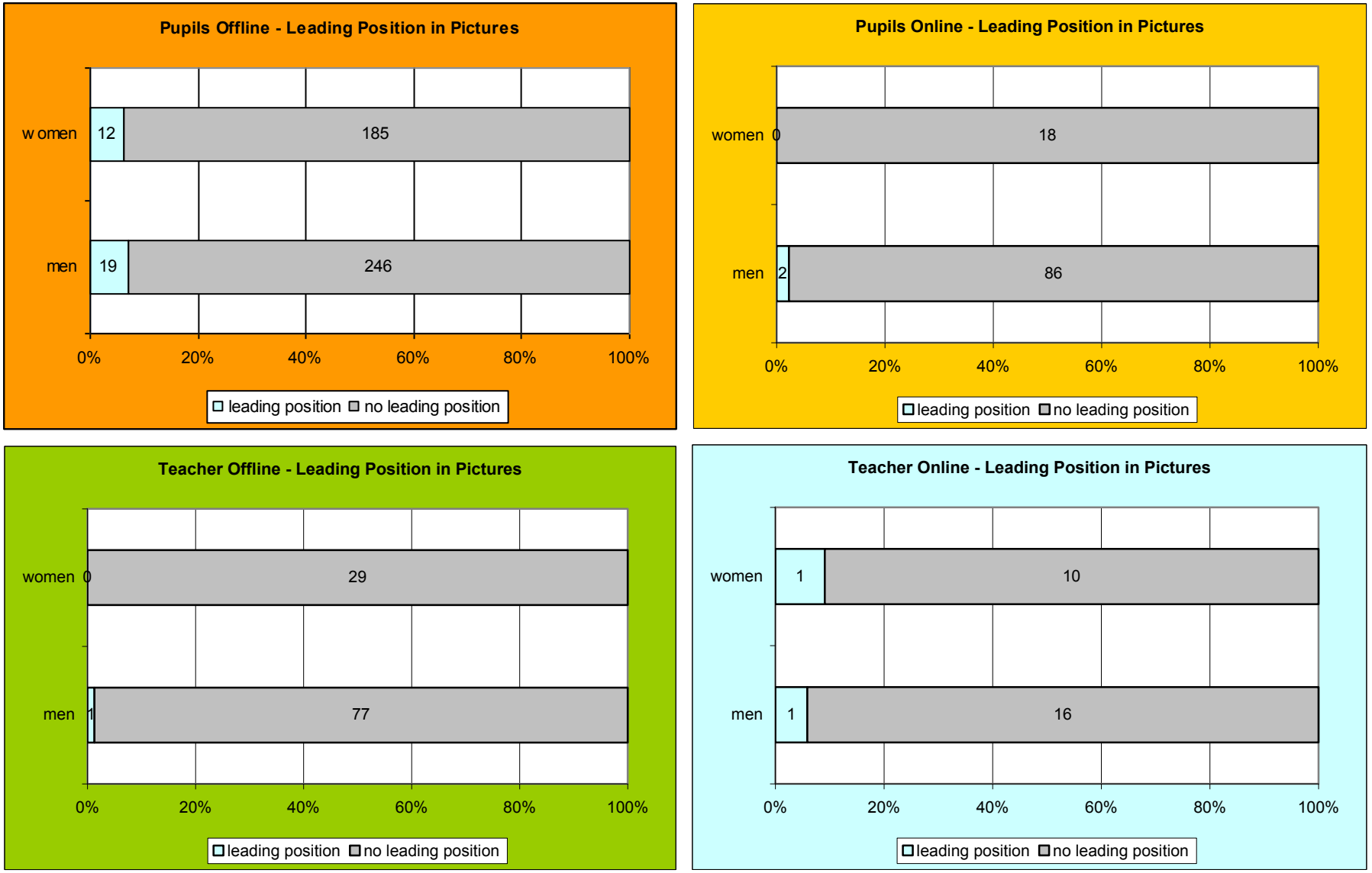


***Figure 3*. Male, Female and Neutral Expressions in Texts**

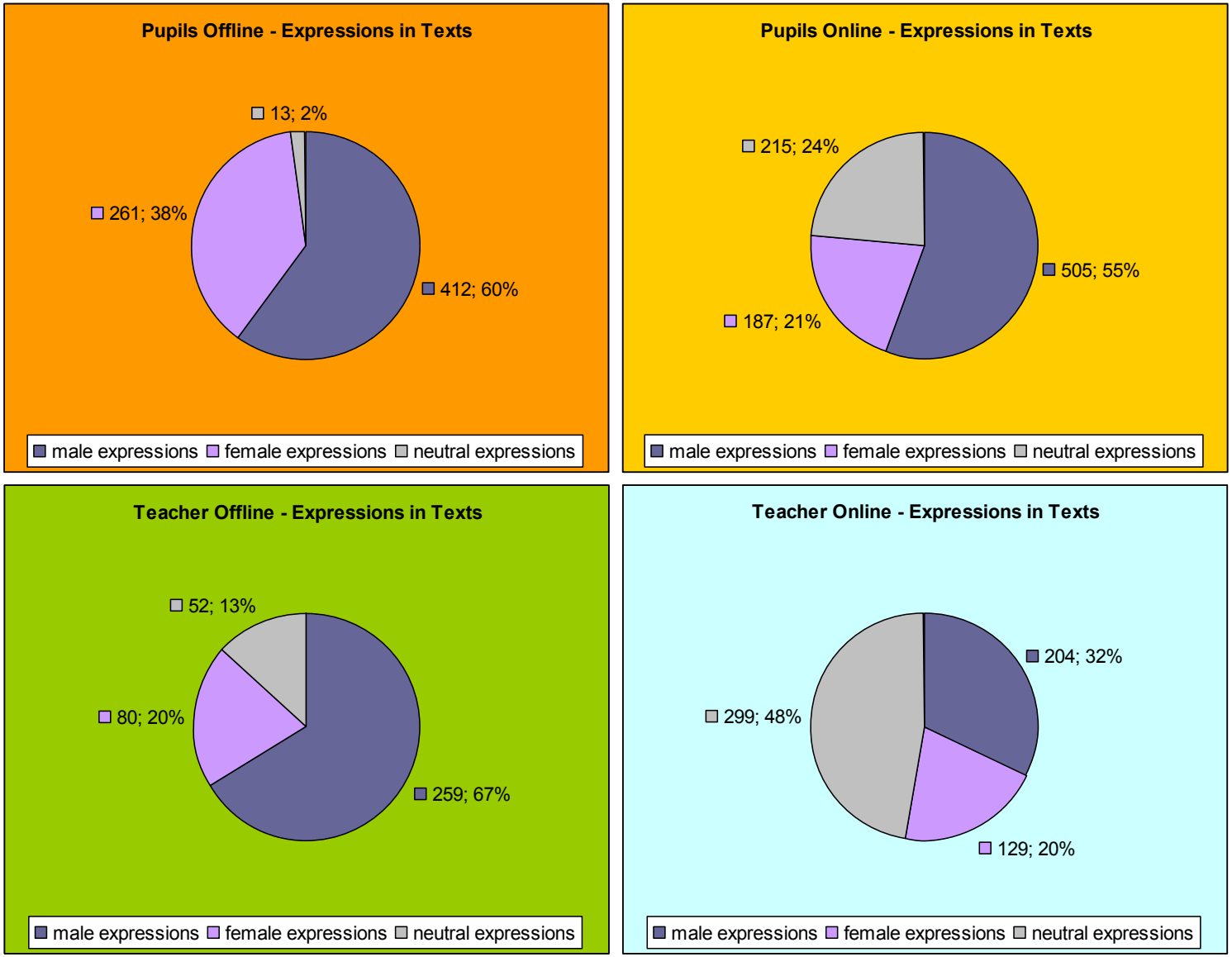


***Figure 4*. Leading Positions in Texts**

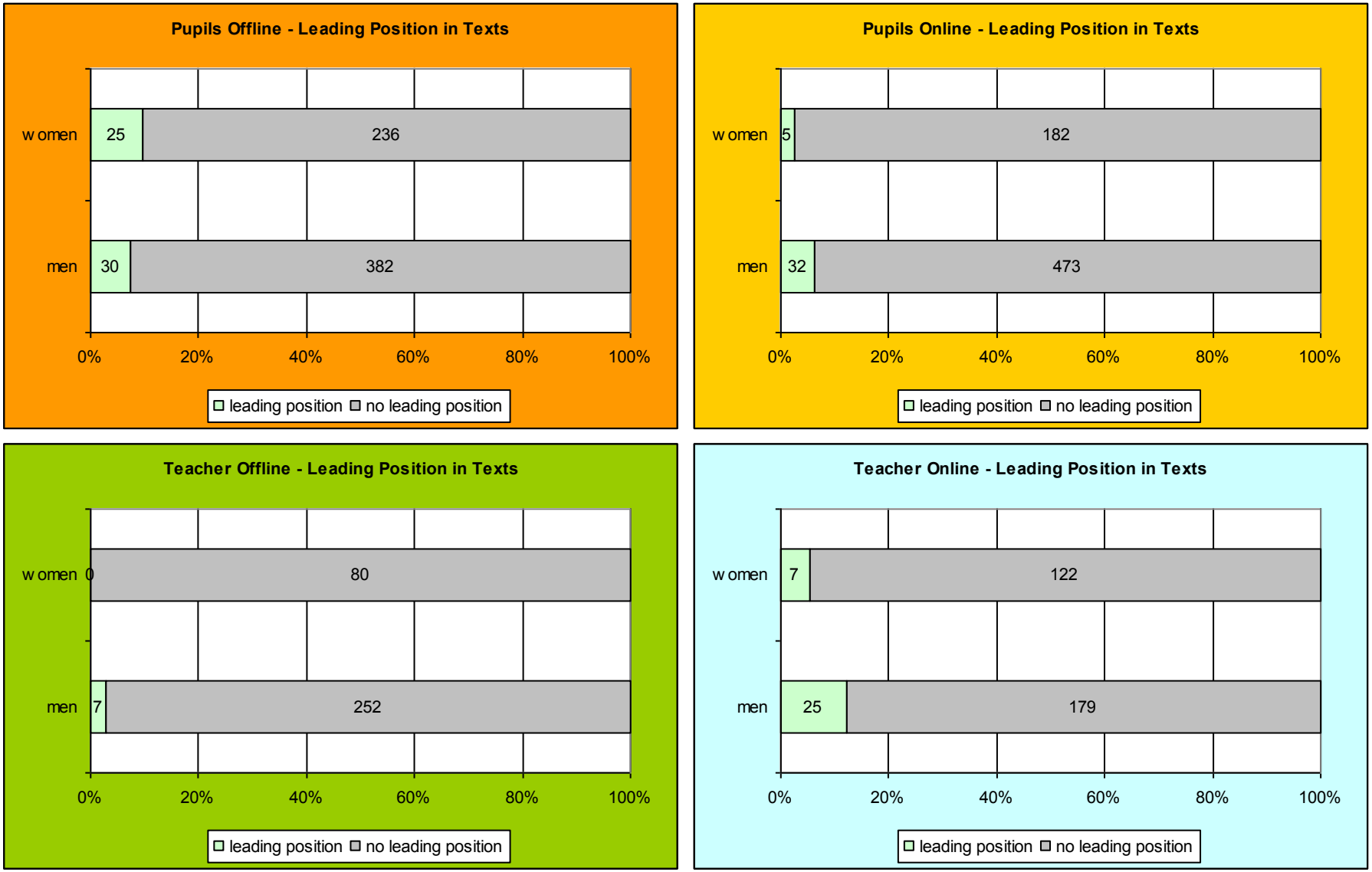
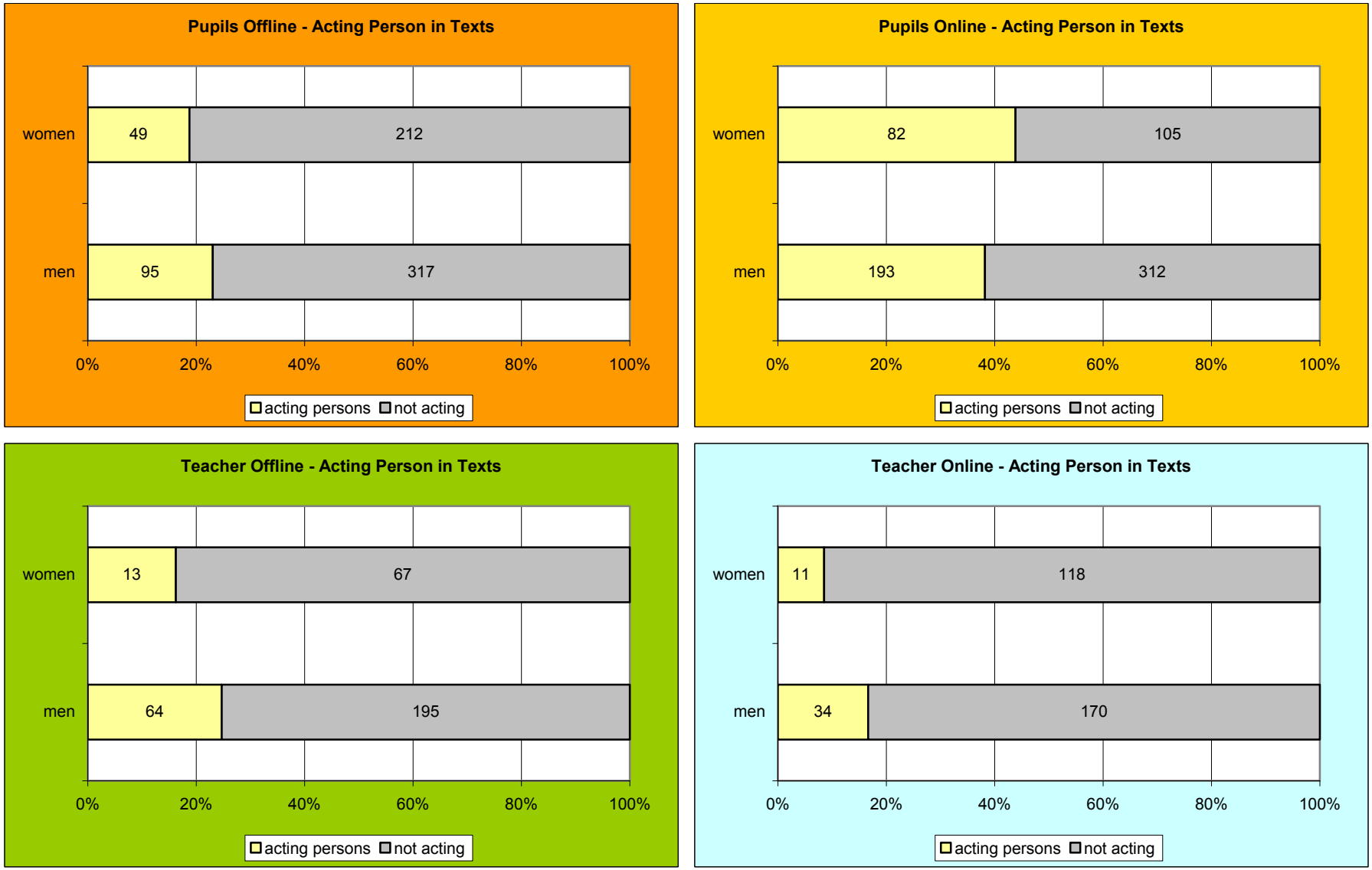


Figure 5. **Acting Persons in Texts**



3.1 Materials for Pupils – Description of Results

People in pictures: The number of people in pictures differs between offline and online materials. In total, the school books have more pictures (462) than the online resources (106; see figure 1). Still, in both types of materials women are under-represented. For online materials this is even more obvious (17% women, and 83% men in pictures) than for offline materials (43% women, and 57% men in pictures).

Expressions in texts: Likewise, the number of female expressions in texts of offline and online materials for pupils is far below that of male expressions (see figure 3). 60% (412) of the expressions in offline materials are male, 38% (261) are female, and 2% (13) are neutral. In the case of online materials, the number of female expressions (187; 21%) is below that of neutral expressions (215; 24%), and male expressions (505; 55%).

The following graphic (figure 6) sums up these results and represents it by showing a female and male figure sized according to their frequent occurrence (in percent) in pictures and text of materials for pupils. A figure would have a size of 100%, if all persons on pictures, or all expressions in text, would have been either female or male, and if no neutral expressions exist. Neutral expressions are not included in this graphic.

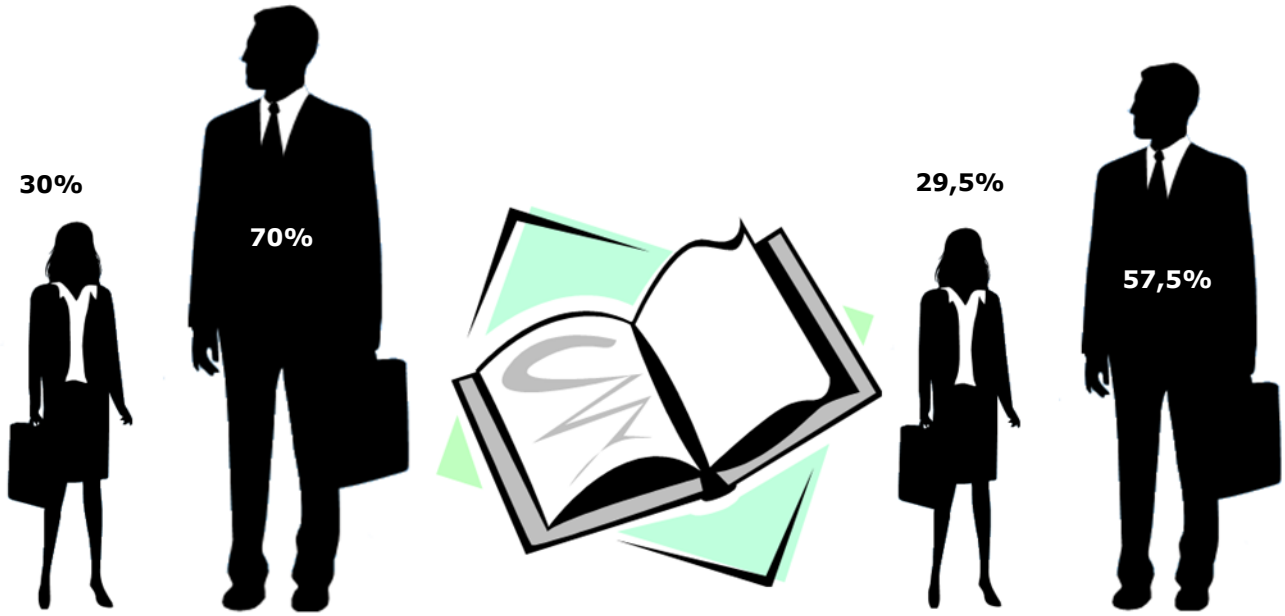


Figure 6. Number of women and men in pictures, and number of female and male expressions in texts of offline and online pupils' materials (in %[3]).

[3] The expanse (height, width) of the figures was adapted to represent the quantitative ratio of women and men in pictures and of female and male expressions .in texts, respectively

Leading positions in pictures: With regard to leading positions in pictures (figure 2) the situation is again to the advantage of men. In offline materials for pupils 6% (12) of the females and 7% (19) males are shown in a leading position. Looking at leading positions only, 61% males and 39% females are found in this category. With regard to offline materials, the category does not play any substantial role, with no women and only 2 men (2%) shown in leading positions in pictures at all.

Leading positions in texts: In the analysed offline materials, the number of men in leading positions (30) is above that of women (25); however, the proportion is to the advantage of women: 10% females are described to be in a leading positions, and 7% of all males occupy a leading position (see figure 4). Looking at the category of leading positions only, the proportion of women (45%) is still below that of men (55%). For online materials the number of men described to be in a leading position is 32 (6%) and it clearly exceeds the number of women (5; 5%), although the in-group percentage is nearly the same. Within the category of leading positions in texts in online materials, again more men (86%) than women (14%) can be found.

Acting persons in texts: In offline materials, the active part in text descriptions is held by more male persons (95; 23%) than females (49; 19%). Although the percentages are close, there are about twice as many men described to be acting. In online materials, the percentage of acting women (44%) is above that of men (38%), but again the total number of acting women (82) is less than half of the number of males (193). Also, for all acting persons, and in both types of materials, the percentage of acting men (offline: 66%, online: 71%) is higher than that of women (offline: 34%; online: 29%).

3.2 Teacher Materials – Description of Results

People in pictures: Women are under-represented in pictures of teacher materials (figure 1). The number of women is below that of men, in offline materials (29 women, 78 men) as well as in online materials (11 women, 17 men). In the offline materials for teachers 27% of the persons on pictures are female (and 73% male), and in online materials 39% of the persons are female (and 61%) are male.

Expressions in texts: The percentage of female expressions in offline and online materials for teachers is both 20%, however in total female expressions are used more often in the online materials (129) than in offline materials (80). In offline materials the majority are male expressions (259; 67%), and 13% (52) are neutral expressions; in online materials the majority of expressions are neutral (299; 48%) and 32% (204) are male expressions (see figure 3).

The following graphic (figure 7) sums up these results and represents it by showing a female and male figure sized according to their frequent occurrence (in percent) in pictures and text of teacher materials respectively. A figure would have a size of 100%, if all persons on pictures, or all expressions in text, would have been either female or male, and if no neutral expressions exist.

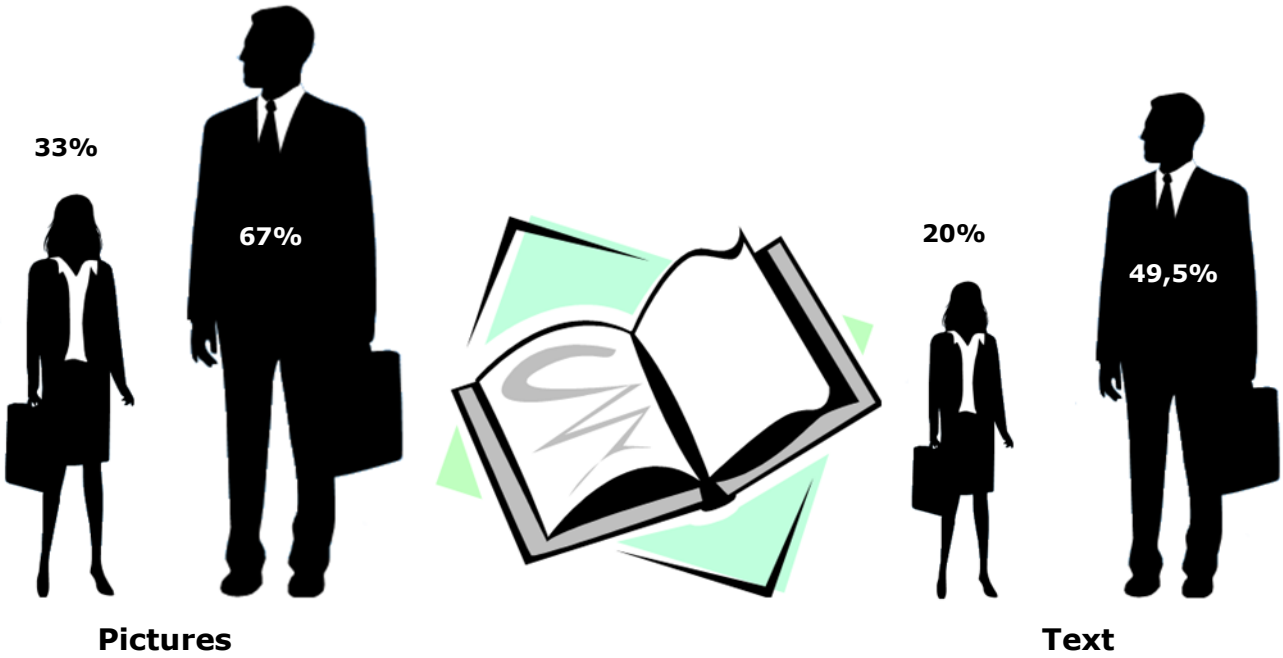


Figure 7. Number of women and men in pictures, and number of female and male expressions in texts of offline and online teachers' materials (in %[4]).

Leading positions in pictures: In pictures of teacher materials there are hardly any persons shown in leading position at all (see figure 3). With regard to offline materials, 1% of the male persons and 0% of the women are presented in leading positions. In online materials, 10% of the women and 6% of the men are shown in leading positions, however, the absolute numbers are equal (1 person).

Leading positions in texts: In offline materials for teachers no woman is described to be in a leading position, and 3% (7) of the male expressions are related to a leading position. With regard to online teacher materials, the difference is higher: 13% of the male expressions and 5% of the female expressions refer to leading positions. Thus, within the category of leading positions 78% are male and 22% female.

Acting persons in texts: In offline materials 25% (64) of the men are described as acting, and 15% (13) of the women perform activities. The same can be observed for online teacher materials: the proportion of active men (34; 17%) exceeds the proportion of active women (11; 9%). Within the category of acting persons in text descriptions of teacher offline and online materials, the majority is male (offline: 83%; online: 76%) and women are underrepresented as acting persons (offline: 17%; online: 24%).

[4] The expanse (height, width) of the figures was adapted to represent the quantitative ratio of women and men in pictures and of female and male expressions .in texts, respectively

4 Examples

The following examples show gender bias *and* equality as presented in texts and pictures of school books and online materials (pupils' materials).

Text example

The following text excerpts from an informatics school book (Brichzin, P., Freiberger, U., Reinold, K., & Wiedemann, U., 2007) describes a discussion between two teachers, about setting up an online data base for the school library

A woman named Frau Liesnix (Mrs. Doesnotread) and a man named Herr Ingeuo (Mr. Ingenuous) meet on a continuing education event for librarians. The choice of names already ascribes certain characteristics to these people; further the German expressions used in the texts are all male, e.g. a male librarian, a male colleague.

> *"Letzte Woche hat Frau Liesnix eine Fortbildung für Schulbibliothekare besucht. Neben dem offiziellen Thema „Lesewettbewerbe" lernt man bei solchen Veranstaltungen auch immer viel durch die Gespräche mit Kollegen. So unterhielt sich Frau Liesnix lange mit Herrn Ingenuo vom Nachbargymnasium. Dort wurde schon vor einem Jahr eine Bibliotheksdatenbank eingeführt und er konnte ihr einige Tipps geben" (Brichzin et al., 2007, S. 123)*

The female teacher receives information about the development of an internet-based database for school libraries and shows interest in establishing such a database for her school.

> *"Herr Ingenuo gab Frau Liesnix die Zugangsdaten, sodass sie sich selbst ein Bild von der Datenbankstruktur des Nachbargymnasiums machen kann. Dort sieht sie einige Details, die für ihre Arbeit von Vorteil wären" (Brichzin et al., 2007, S. 123).*

The male teacher already uses such a database at his school and intends to develop its functionalities, although without taking into account important privacy issues of pupils' personal data.

> *"Herrn Ingenuos Plan für die Zukunft ist es, die Bibliotheksdatenbank mit der Schülerverwaltung zu vernetzen, dann lassen sich die Informationen wie „aktuelle Klasse" oder „Adresse" automatisch übernehmen. Zur Sicherheit bei Rechnerausfällen wird die Datenbank alle 14 Tage auf einer CD gespeichert. Diese CDs werden in einem Regalfach abgelegt, wo sie niemand stören" (Brichzin et al., 2007, S. 123).*

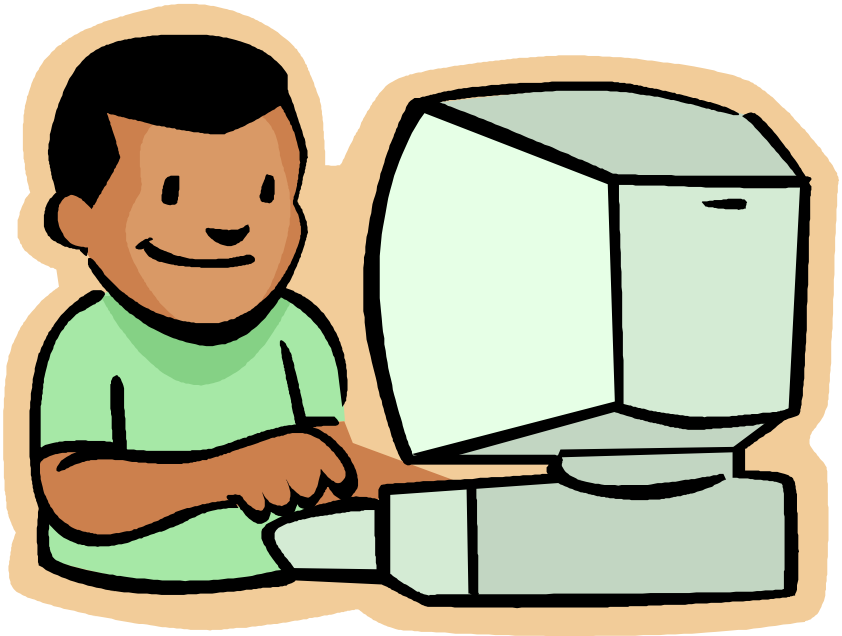
Picture examples

The following pictures have been reproduced on the basis of original pictures from several informatics school books. They show how boys and girls, men and women, with different ethic background, are represented in the context of using computers and electronic media.

Picture 1: two boys using a computer in a computer classroom. (Original picture from Landesbildungsserver B, n.d.)

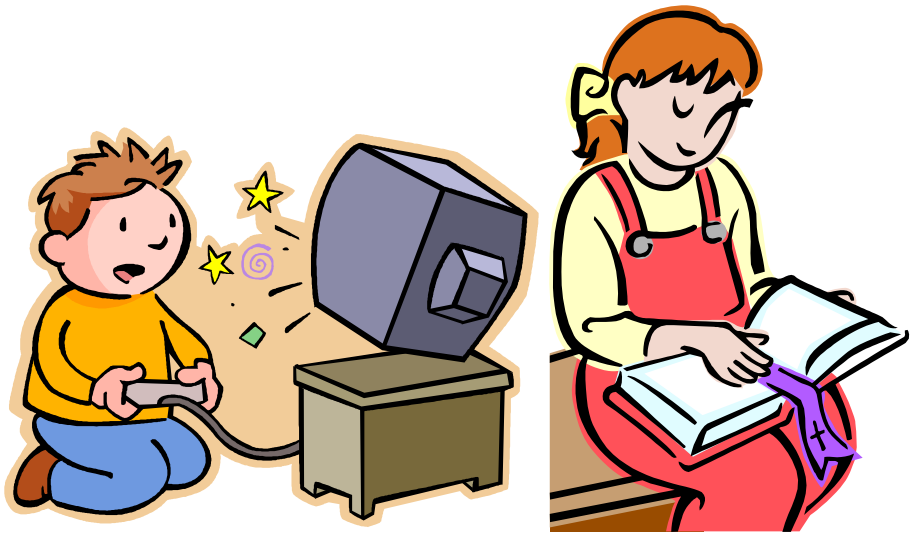
Picture 2: A female and male student, in front of a computer and other technical equipment; the female student is actively using the computer. (Original picture from Berndt, E.-B., Kehlert, M., Lienert, K., & Reuen, S., 2005).

Picture 3: A female and male student, foreign-appearing, in front of a computer; the female student is actively using the computer. (Original picture from Multimedia im Unterricht, 2003; not included in the analysis)



Picture 4: A male, foreign-appearing student using a computer; another male and female student is working with computers in the background. (Original picture from Multimedia im Unterricht, 2003; not included in the analysis)

Picture 5: A man working in front of 7 computer monitors and 1 TV; a woman can be seen on the TV screen, working as a news speaker. (Original picture from Bähnisch, U., Feuerstein, R., Gramm, A., Haß, J., Holm, M., Karau, D., et al., 2008).



Picture 6 : A page from the section "media pictures and book" shows boys and girls performing different media activities; the boys play computer, watch news reports about war; the girls communicate with mobile phones, read Bravo magazines. (Original picture from Dein, J., Döring, B., Engel, A., Genstorfer, A., Gerwig, I., Kreisel, M., et al., 2004).

5 Summary and Conclusion

In summary, it can be said that both kinds of materials, for pupils and for teachers, show a bias in the frequencies of men and women in texts and pictures. Although, it has to be noted that the selection of materials was exemplarily and was also dependent on the availability of the materials. Further, the number of materials considered in each category is rather low and not representative. Still, the results suggest that in offline as well as in online materials, the number of men exceeds that of women and women are less often presented as acting or in a leading position.

Within the two categories that look at the overall ***numbers of males and females*** in pictures and texts it can be reported for all types of materials that the share of males exceeds that of women.

More than half, often more than 2/3, of the persons in pictures are male. Especially, pictures of online materials for pupils show much more men. Although, it has to be noted that pictures play an inferior role in online materials than in offline materials which include about 4 times as many pictures with persons in it.

In texts, where also neutral expressions were counted, the overall picture is the same: about 1/3 to 2/3 of the expressions in all materials are male. Neutral expressions are rather important in the context of online materials. Especially the analysed teacher online materials included nearly 50% neutral expressions, which either address both gender equally or are not related to any gender at all.

Looking at the represented ***leading positions and activities of persons*** it can be concluded that for all types of materials the situation is to the advantage of men.

Within each text, the total number of men in leading positions or described as acting is above that of women. This result has two exceptions: the in-group percentage of all women reported to be in a leading position in texts (pupils' offline materials) and described as acting persons (pupils online materials) is above that of men. This means, if women are represented in these texts at all, they are more often in an acting role, than the men represented in the same texts.

The category of leading positions in pictures did only play a role in pupils' offline materials. In these pictures, again the share of females in leading positions is clearly below that of males.

The ***text example*** provided in section 4 ascribes men and women with different activities and roles, and additionally the choice of names (Frau Liesnix and Herr Ingenuo) implies certain characteristics to these people: the woman is presented as a person less interested in reading instructional materials (although she is working as a librarian and participates in an educational event), and the man is considered as rather naïve in his usage of privacy information in a computer database (although he is presented as active in using internet-based databases in his library).

The analysis at hand focused merely on the numbers of male and female expressions and the occurrence of active/leading persons by sex; however, such examples, suggest, that a qualitative analysis of the actual contents of exercises and task descriptions might reveal a bias that goes beyond frequencies of male and female expressions (see also Helling & Petter, 2008).

Similarly, a qualitative analysis of the pictures in the materials for pupils might reveal additional imbalances in the presentation of men and women. Looking at the ***examples of pictures***, it can be seen that there are pictures which present only boys

in front of a computer (picture 1) or ascribe stereotypical activities and interests to males and females, e.g. boys play computer, girls communicate by mobile phone (picture 5 and 6). It has to be noted, that there are also pictures which serve as good practice examples for the presentation of men and women in the context of ICT usage. For example, pictures 2 and 3 show men and women, foreign-appearing, in front of a computer, with the women actually using the keyboard and mouse.

The results show that the overall bias revealed in pupils' and teachers' materials is to the advantage of men. In consequence, girls at school have less opportunities to see role examples of women in an informatics and ICT context, which might support the reproduction of stereotypes in the field of women and ICT (see Chapman, n.d.; Schneider, 2006; Wiesner et al., 2003)

With regard to school books, this is a rather alarming result. Several schoolbooks in Germany have to be accredited by the cultural ministries of the Länder or special authorities before they are recommended for use in accordance with the state specific school curriculums. Therefore, the aim of school book accreditation processes must be to consider – among other quality aspects – the gender sensitivity of texts and pictures. Not only publishers need to take gender aspects into account, also teachers would need increased awareness for the issue of representing males and females in learning and teaching materials. Online materials for pupils and teachers are collected and provided in the context of projects and special initiatives, or uploaded by individual informatics teachers which are motivated to share their materials with colleagues all over Germany. These materials often are not subject to any accreditation process or quality control at all.

In conclusion, it has to be noted that the production and selection of materials for pupils and teachers and related accreditation and quality control processes need to focus on gender equality aspects more intensely. Furthermore, because of the free availability and exchange of materials, especially in online repositories and databases, teacher training and further education needs to raise teachers' awareness for gender issues and develop competences for a gender-reflective use of such materials during lessons. Currently, only few materials are available for this purpose and teachers are self-responsible for its application (see e.g. the 3-R-Method for analysing gender and related behaviour and roles in teaching and learning at school; Troltenier, 2006).

The overal aim should be to support boys and girls equally and with a focus on gender sensitivity, starting with materials that are designed accordingly, and proceeding towards gender reflective teaching practices. The provision of gender support by teachers through structured measures across the curricular would be inevitable for advancing gender equality in general and in relation to informatics at school. In a long-term perspective, this might reduce inequality in ICT usage in and out of school, and result in an increased uptake of careers in informatics by females through gender-sensitive socialisation processes in school education (see also Ertl & Helling, in press).

6 References

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Annex 1 - List of School Books & Jounals

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Brichzin, P., Freiberger, U., Reinold, K., & Wiedemann, U. (2005). Grundlagen der Informatik. München: Oldenbourg Schulbuchverlag

Brichzin, P., Freiberger, U., Reinold, K., & Wiedemann, U. (2004). IKARUS Natur und Technik. Schwerpunkt: Informatik. München: Oldenbourg Schulbuchverlag.

Dein, J., Döring, B., Engel, A., Genstorfer, A., Gerwig, I., Kreisel, M., et al. (2004). deutsch.werk 1. Realschule. Arbeitsbuch für das 5. Schuljahr. Leipzig: Klett.

Engelmann, L. (Ed.). (2008). Duden Informatik S1. Informatische Grundbildung. Berlin: DUDEN PAETEC Schulbuchverlag.

Fischer, H., Knapp, T., & Neupert, H. (2006). Grundlagen der Informatik II. München: Oldenbourg Schulbuchverlag.

Frey, E., Hubwieser, P., & Winhard, F. (2004). Informatik 1. Objekte Strukturen Algorithmen. Informatik für Gymnasien. Stuttgart: Klett.

Hubwieser, P., Spohrer, M., Steinert, M., & Voß, S. (2007). Informatik. Lehrwerk für Gymnasien. 2. Stuttgart: Klett.

LOGIN. (2008). Informatische Bildung und Computer in der Schule. Heft 154/155

LOGIN. (2009). Informatische Bildung und Computer in der Schule. Heft 157/58

Annex 2 – Structure of Resources

6.1 Offline materials for pupils

Name of the material	**Informatik 1. Objekte Strukturen Algorithmen. Informatik für Gymnasien.**
Reference/ URL of the material	Frey, E., Hubwieser, P., & Winhard, F. (2004). Informatik 1. Objekte Strukturen Algorithmen. Informatik für Gymnasien. Stuttgart: Klett.
Extent of the material	1 book, about 100 pages
Complete analysis or a partial analysis?	Partial analysis of the book. The following two chapters have been analysed: Chapter II – Object relations (pp. 30-43), Chapter V – Automation (pp. 74-95). Complete analysis of pictures in the book.
Short description	Coherent explanations. Introductions in the form of stories. Exercises with reference to daily life of pupils. Processes of object-relations (objects in texts, relations between objects, multimedia-documents, text for reading: computer science and language) Processes of automation (step by step, revisions, decisions, sharing exercises, text for reading: "Wann sind Bedingungen erfüllt?" (fulfilment of conditions), graphical description of algorithms, programming with LEGO)
Pictures/ Text	Nearly all pages contain picture, in a ratio of about 50:50 Women prevail in both, pictures and texts. Besides women are stronger represented in the acting and leading positions in the text, but men are stronger represented in the leading position in pictures.
Anything else?	Robot Karl is used as an example, dominates in chapter V 18 pages the explanation (not counted for the analysis); the female and male terms for pupils (Schülerinnen, Schüler) are used consistently throughout the texts.

Name of the material	**Informatik I. Funktionale Modellierung. Datenmodellierung**
Reference/ URL of the material	Brichzin, P., Freiberger, U., Reinold, K., & Wiedemann, U. (2007). Informatik I. Funktionale Modellierung. Datenmodellierung. München: Oldenbourg Schulbuchverlag
Extent of the material	1 book, about 160 pages
Complete	Partial analysis of the texts and descriptions. The following chapters have

analysis or a partial analysis?	been analysed: Data-safety and data-security (p.123-127); Continuing Reading II (p. 135-141). Complete analysis of pictures in the book.
Short description	Full explanation with background information about data-safety, big databases, ISBN international standard book number, several tasks of database-management-system, normal forms, biometrical data as key, wordings of law.
Pictures/ Text	The material contains only few pictures, but on these pictures, the number of men exceeds the number of women. In the texts, the number of men as acting persons is higher than that of women. Same number of leading positions. High number of neutral expressions.
Anything else?	The male plural is used consistently for both, male and females.

Name of the material	**IKARUS Natur und Technik. Schwerpunkt: Informatik bzw. Grundlagen der Informatik**
Reference/ URL of the material	Brichzin, P., Freiberger, U., Reinold, K., & Wiedemann, U. (2004). IKARUS Natur und Technik. Schwerpunkt: Informatik. München: Oldenbourg Schulbuchverlag. bzw. Brichzin, P., Freiberger, U., Reinold, K., & Wiedemann, U. (2005). Grundlagen der Informatik. München: Oldenbourg Schulbuchverlag
Extent of the material	1 book, about 160 pages
Complete analysis or a partial analysis?	Partial analysis of the texts and descriptions. The following chapter has been analysed: Hierarchical information-structures (p.65-79). Complete analysis of pictures in the book.
Short description	Meaningful file management with class structures (e.g. attributes methods and relations).
Pictures/ Text	Low Number of Women in the text but the only photography with a person is shows a woman; The only leading position is occupied by a woman; Much higher Number of men as acting persons. Many neutral expressions.
Anything else?	The male plural is used consistently for both, male and females.

Name of the material	**Duden Informatik S1. Informatische Grundbildung**
Reference/ URL of the	Engelmann, L. (Ed.). (2008). Duden Informatik S1. Informatische

material	Grundbildung. Berlin: DUDEN PAETEC Schulbuchverlag.
Extent of the material	1 book, about 320 pages
Complete analysis or a partial analysis?	Partial analysis of the texts and descriptions. The following chapter has been analysed: News objects (p.123-136). Complete analysis of pictures in the book
Short description	Playful introduction with a game which is related to the theme "news objects". Historical development of "news getting". Coherent exercises.
Pictures/ Text	Pupils are addressed directly during the texts. The texts are illustrated with many pictures of male persons and with some graphics and algorithms.
Anything else?	Consistent use of male terms to address the pupils, e.g. "Schüler" (pupils) "Mitschüler" (classmate).

Name of the material	**Grundlagen der Informatik II**
Reference/ URL of the material	Fischer, H., Knapp, T., & Neupert, H. (2006). Grundlagen der Informatik II. München: Oldenbourg Schulbuchverlag.
Extent of the material	1 book, about 190 pages
Complete analysis or a partial analysis?	Partial analysis of the texts and descriptions. The following chapters have been analysed: Text A: Open day at the new school in Infohausen (p.78-81) and Project realization (p.90-96); Text B: Continuing reading (who was N.J. Lehmann?; Card-to-tap and ticker-tape; Tricks for presenting – where to put the hands?) (p.114-120) Complete analysis of pictures in the book.
Short description	Coherent explanations and exercises with reference to the daily life of pupils. Text A describes a school-project for designing a new school-logo. Text B describes particularities about the life and the invention of several pioneers of informatics and especially Lehman because the school is named after him
Pictures/ Text	The text is illustrated by pictures, but not on every page; Men prevail in pictures as well as in text; The number of men and women in leading positions in pictures is nearly the same; The number of men as acting persons is much higher than the number of women as acting persons; The leading positions only differ a little (men 2: women 1). Neutral expressions are in the text too.
Anything else?	Text A: gender-typical career allocation (women as teachers for German/Art; men as teachers for physics/computer science); furthermore 16 male

	persons, because the school is named after a popular professor of physics (not counted for the analysis), Text B: mainly male e.g. „computer-experts, „students"; The Name Lehman was counted as male 2 times).

Name of the material	**Informatik. Lehrwerk für Gymnasien. 2**
Reference/ URL of the material	Hubwieser, P., Spohrer, M., Steinert, M., & Voß, S. (2007). Informatik. Lehrwerk für Gymnasien. 2. Stuttgart: Klett.
Extent of the material	1 book, about 180 pages
Complete analysis or a partial analysis?	Partial analysis of the texts and descriptions. The following chapter has been analysed: Analysis of tables (p.129 – 145). Complete analysis of pictures in the book.
Short description	Pupils are working with modern hard- and software-systems and learning the basic principles of representation, processing, and interpretation of information. Educational aims of this unit: the useful combination of several tables, the extension of tables, the aggregation of records, the safety of files, the deception of files and the scanning of several tables.
Pictures/ Text	On each page, there is at least one picture, together with texts. More pictures show men than women; more leading positions of men in the pictures; more distinctly expressions of women in the text; but neutral expression are often in the male form.
Anything else?	High number of mentions is achieved because of male and female persons as table-file-material; only male, neutral expressions, including „pupils", „minister", „customer", „employee"

Name of the material	**START IT. Band 2**
Reference/ URL of the material	Berndt, E.-B., Kehlert, M., Lienert, K., & Reuen, S. (2005). START IT. Band 2. Stuttgart: Klett.
Extent of the material	1 book, about 160 pages
Complete analysis or a partial	Partial analysis of the texts and descriptions. The following chapters have been analysed: "to present and to publish" (p. 35-46); "to calculate and to depict" (p. 47-56).

analysis?	Complete analysis of pictures in the book.
Short description	Figured pages with plausible overview. Suggestions for using the acquired knowledge and skills in day-to-day life. The pupils are learning how to present and publish, and how they can calculate and depict data e.g. with graphics.
Pictures/ Text	Each page is illustrated by 2 or more pictures; More pictures of women, women are more often in leading positions in the pictures; low number of counted male/female expressions in the text/ no acting/leading positions in the text
Anything else?	The text is composed as an instruction; readers are directly addressed with "you" or in the imperative, therefore male and female expressions are used in the examples of exercises only; only male form of terms and established expressions like "employer", "user"

Name of the material	**Informationstechnische Grundbildung ab Klasse 9**
Reference/ URL of the material	Bähnisch, U., Feuerstein, R., Gramm, A., Haß, J., Holm, M., Karau, D., et al. (2008). Informatik. Informationstechnische Grundbildung ab Klasse 9. Berlin: Cornelsen.
Extent of the material	1 book, about 190 pages
Complete analysis or a partial analysis?	Partial analysis of the texts and descriptions. The following chapters have been analysed: "Creation of a separate webpage" (p. 101): "The separate webpage on the internet" (p.102); "How does the webpage come into the internet?" (p. 103); "How to create a webpage with a WYSIWYG-HTML-Editor" (p. 104-105); "Publication of the webpage" (p. 106-107); "Planning a web-project" (p.108); "folder-structure" (p.109); "Link-structure: navigation and hyperlinks" (p. 110); "Consistent designing of WebPages: Templates" (p.111); "projects" (p. 112-113). Complete analysis of pictures in the book.
Short description	Introduction and explanation about the creation of a webpage. Description of the particular steps, supported by pictures and, helpful hints on many pages.
Pictures/ Text	Each page is illustrated by at least one picture; Many pictures; more men in pictures as well as in the text
Anything else?	The text is composed like an explanation/instruction and the readers are directly addressed with the imperative, therefore male and female expressions are used in the examples of exercises only; only male form of terms and established expressions like „user", „pupil", „composer"

Name of the material	**deutsch.werk 1. Realschule. Arbeitsbuch für das 5. Schuljahr**
Reference/ URL of the material	Dein, J., Döring, B., Engel, A., Genstorfer, A., Gerwig, I., Kreisel, M., et al. (2004). deutsch.werk 1. Realschule. Arbeitsbuch für das 5. Schuljahr. Leipzig: Klett.
Extent of the material	1 book, about 290 pages
Complete analysis or a partial analysis?	Partial analysis of the texts and descriptions. The following chapters have been analysed: Text A – Spare-time and media" (134-143); Text B - Working with the computer (p. 269-273). Complete analysis of pictures in the book.
Short description	The book is in general a book for German language teaching. However, it includes texts by which pupils are learning about the important role of media and how to work with the computer (interdisciplinary media education). Text A is about the role of media in spare-time of adolescents; many examples refer to computer games. Text B is a short chapter with instructions in dealing with computers. Step-by-step explanations with some explanatory pictures are provided.
Pictures/ Text	Nearly every page shows a picture to illustrate the text; Many picture, mainly with men on it; in the text are much more men too and also in a(n) active/leading position.
Anything else?	Text A: the protagonists are mainly male persons; text A is written in the imperative. Text B: it does not contain any pictures or male/female expressions.

6.2 Online materials for pupils

Name of the material	**lehrer-online - Unterrichten mit digitalen Medien**
Reference/ URL of the material	**Portal: lehrer-online** (www.leherer-online.de) Material: E-Mails verschlüsseln (encoding e-mails) Webpage: http://www.lehrer-online.de/e-mail-verschluesseln.php?sid=99473505599105486024582958308420 PDF-Version: http://www.lehrer-online.de/dyn/bin/399161-401167-1-bb_ue2_e_mail_verschluesseln.pdf
Extent of the material	Webpage Version: Start page with overview of the teaching unit; further links to an introduction section of the topic and to a page with the actual task description for the pupils; several links to external information materials (web

	pages, PDFs, software) PDF Version: 1 PDF-file, about 5 pages.
Complete analysis or a partial analysis?	The material "encoding e-mails" was analysed partially; we analysed the following sections from the webpage-version: the start page of the material "E-Mails verschlüsseln" (encoding e-mails), excluding the section "information on the author"; the pages "Einführung in das Thema" (introduction) and "Verschlüsselung eigener Nachrichten" (encoding own messages); the external links to two the working materials "Verschlüsselungsverfahren" (methods of encoding, web page) and "E-Mails – aber sicher!" (E-Mails – but secure!, PDF, 44 pages: Chapter 1-2 analysed exemplarily, all pictures/ graphics analysed)
Short description	The online portal "lehrer-online" contains several materials for pupils to be used during classes. The material "encoding e-mails" was chosen from the teaching units on business informatics. It is only one of the numerous materials available on the portal "lehrer-online". Pupils (female and male) learn to encode their e-Mails utilizing the software programmes Good Privacy and GnuPG.
Pictures/ Text	Webpages: mainly text, some pictures (which do not show people); External information materials: mainly text, some pictures with male/female persons
Anything else?	The descriptions on the web pages were quite gender-sensitive. In the analysed external information materials the text/ description was less gender-sensitive which is the main reason for the identified asymmetry of male and female expressions of the complete materials.

Name of the material	**e-Trichter: Online-Materials for the computer-science-lessons**
Reference/ URL of the material	**Portal: e-Trichter: Online-Materialien für den Informatikunterricht** (www.e-trichter.de) Material: Modellierung (modelling; grade 10) www.e-trichter.de/Modellierung/Modelle.php; www.e-trichter.de/Modellierung/Modellierung.php; Material: Datenbanken (databases; grade 10) www.e-trichter.de/Datenbanken/Datenbanksysteme.php; www.e-trichter.de/Datenbanken/Datenmodellierung_I.php; www.e-trichter.de/Datenbanken/Datenmodellierung_II.php; www.e-trichter.de/Datenbanken/Beispieldatenbank_Bibliothek.php http://www.e-trichter.de/Datenbanken/Beispiele/Bibliothek/Bibliothek.pdf
Extent of the material	Start-page with overview of classes and themes, further links to many particular pages. For the analysis we selected 6 WebPages and 1 PDF-file with 2 pages.

Complete analysis or a partial analysis?	Complete analysis of the two materials "modelling" and "data bases".
Short description	e-trichter is a collection of learning facilities and worksheets, which were developed on the basis of daily lessons at school. The topics included introductions to standard software, programming, object orientation, data bases, functional modelling and algorithms. The collection is extended constantly and provides insight into the experiences of informatics teachers.
Pictures/ Text	Barely pictures; much more men than women; some neutral expressions like "persons"

Name of the material	**einstieg-informatik**
Reference/ URL of the material	**Portal: einstieg-informatik** (www.einstieg-informatik.de) Material: Schatzsuche – endliche Automaten (treasure hunt – finite state automation) http://www.einstieg-informatik.de/index.php?article_id=69&back=121 http://www.kompetenzz.de/content/download/4448/34032/file/schatzsuche_Einstieg%20Informatik.pdf Material: Schlachtschiffe – Suchalgorithmen (battleships – search algorithms) http://www.einstieg-informatik.de/index.php?article_id=70&back=121 http://www.kompetenzz.de/content/download/4449/34035/file/schlachtschiffe_Einstieg%20Informatik.pdf
Extent of the material	The portal provides an overview about relevant issues for people interested in studying computer science at university, including numerous web pages with information about study courses, events, and people already working in informatics professions at school, university and in companies. The "Infothek" includes exercises and examples for reading and practicing informatics activities, including four materials for pupils in the menu section "do it your-self" (http://www.einstieg-informatik.de/index.php?article_id=68&back=121)
Complete analysis or a partial analysis?	Complete analysis of the two materials "treasure hunt" and "battle ships". 2 PDF files about, 11 (incl. 4 pages printout material/graphics) and 18 pages (incl. 12 pages print out material/graphics).
Short description	Treasure hunt: Computers work with symbol and word sequences and computer-scientists often use finite state automation in this respect. A finite state automation follows certain instructions for finding out, if the computer realizes the words and symbol sequences. The material is a playful introduction into this theme with treasure maps. Battleships: Material about the concepts of two often used methods, which

	enable computer to search files rapidly.
Pictures/ Text	Some pictures to visualize the treasure hunt and a battleship search structure. Many neutral expressions like "child". More men in the text and the pictures, and also more male persons in acting/leading position. Pupils are addressed directly in the text of exercises.

Name of the material	**ingo-bartling.de – Mathe, Physik, Informatik**
Reference/ URL of the material	**Portal: Ingo Bartling** (www.ingo-bartling.de) Materials: Einführung Informatik, Klasse 6 (introduction to informatics, grade 6): • Das E-V-A Prinzip der Hardware (the E-V-A principle of hardware) http://www.ingo-bartling.de/info/klasse6/pdf/evaprinzip.pdf Internet, Klasse 7 (Internet, grade 7): • Script (script) http://www.ingo-bartling.de/info/klasse7/pdf/internet_skript.pdf • Snailmail und email: Wie schützt man seine Identität im Internet? (snailmail and email: How to preserve your identity on the internet?) http://www.ingo-bartling.de/info/klasse7/html/internet/Identitaet.html Informatik – Datenbanken, Klasse 9 (informatics – data bases, grade 9) • Datenbanken 1 – Karteikarten (databases 1 – cue cards) http://www.ingo-bartling.de/info/klasse9/pdf/datenbank/DB1.pdf • Datenbanken 2 – SQL-Abfragen 1 (Data bases 2 – SQL query 1) http://www.ingo-bartling.de/info/klasse9/pdf/datenbank/DB2.pdf SQL-Abfragen, Klasse 10 (SQL query, grade 10) • Übungen – Übungsaufgaben ER-Modell 2 – Schule (exercises ER-model 2 – school) http://www.ingo-bartling.de/info/klasse10/pdf/datenbank/10_uebungsaufgaben_er.pdf
Extent of the material	Website published by Ingo Bartling with general information, exercises, materials, links, glossaries tests, games and software for the subjects mathematics, physics and informatics, sorted by grade. The analysed materials were chosen from the Informatics section, they had the following extent: E-V-A: 1 PDF-file, about 1 page Internet script: 1 PDF-file, about 4 pages Identity: 1 webpage (about 4 pages if printed) Data bases 1: 1 PDF-file, about 4 pages

	Data bases 2: 1 PDF-file, about 4 pages ER-model: 1 PDF-file, about 2 pages
Short description	E-V-A: Worksheet with gap text; pupils must have background knowledge to fill in the gaps or they would need teacher support. Internet script: Background information about the internet; explanation of several terms. Identity: Hints for preserving the own identity on the internet (e.g. in online communities, chats etc.) Informing children about behaviour in using the internet. Data bases 1: The example is build around a sports club which decides to transfer its member administration from a card box structure to a computer data base. The terms classes and object cards are reviewed. The material includes exercises and related answers. Data bases 2: The relation between card box and data base is explained. An exercise in SQL is proposed. ER-model: The task for the pupils is to model the school with its classes, pupils and teachers by filling the model with data. SQL queries are practiced.
Complete analysis or a partial analysis?	Complete analysis of the following materials: E-V-A, Internet, Identity, Data bases 1 and 2, ER-Model
Pictures/ Text	E-V-A: Only one picture without persons; Example-exercise is about a boy; that is why there are more male persons in the text; one neutral expression "creature". Internet script: 1 woman on picture in leading position, unrecognisable number of women in a photograph of a conciliatory-room; text: male expressions are hardly mentioned, female expressions are not mentioned at all, some neutral expressions like "people". Identity: Few pictures with 1 female person and 2 male persons; balanced ratio between female/male persons and neutral expressions. Data bases 1: No pictures with people on it; no female expressions; many male expressions used in the example; generally phrased task descriptions Data bases 2: No pictures with people on it; balanced ratio between female/male expressions and neutral expressions ER-model: No pictures; more male persons than female; some neutral expressions.
Anything else?	Internet script: Unrecognisable number of women in a photograph of a conciliatory-room because the picture is too small.

	Data bases 2: High number of persons because of a data-list with names ER-model: High number of persons because of a data-list with names

Name of the material	**Martin Jakobs – Material und Unterrichtseinheiten für den Informatik Unterricht**
Reference/ URL of the material	**Portal: Martin Jakobs** (www.martinjakobs.de) Material: Objektorientierte Programmierung – Grundlagen der OOP mit Delphi (Object-oriented programming with Delphi) http://www.martinjakobs.de/pages/objektorientierte-programmierung.php; Das Text-Adventure (the text adventure): http://www.martinjakobs.de/modules/download_gallery/dlc.php?file=33 Material: 3 Probleme mit rekursiven Lösungen (3 problems with recursive solutions) http://www.martinjakobs.de/media/Rekursion/Rekursion_3_Problememitrekursiver Loesung.pdf
Extent of the material	The website of Martin Jakobs provides a collection of materials and programmes to be used in informatics lessons at school. The materials are sorted according to ten different topics. OOP: the complete material includes 3 zip-packages each with a programme, and related PDF or Word with a task description. Recursive solutions: the complete material consists of 1 PDF file with task description, and 1 zip-package which included the programme files.
Complete analysis or a partial analysis?	OOP: Partial analysis of the materials – the PDF-file "Grundlagen der OOP in Delphi" was analysed (about 7 pages). Recursive solutions: Partial analysis of the material, the PDF-file "Probleme mit rekursiven Lösungen" was analysed (about 20 pages).
Short description	OOP: The expressions class and object the relations between these are explained by the implementation of text adventures. The interaction of a class and the related objects is pointed out. The material is flexible and can be easy extended, e.g. by programming own games. Recursive solutions: The material presents three problems which can be solved recursively. The material includes several approaches to teaching pupils recursive solutions
Pictures/ Text	OOP: No pictures with persons; only male expressions used in the text, e.g. "Schüler" (male pupil) Recursive solutions: No pictures with persons; no female expressions and some neutral expressions like "Schüler/innen" (male/female pupils)

Name of the material	**Gymnasium Odenthal: Unterrichtsmaterial Informatik – Mathematik**
Reference/ URL of the material	**Website: Gymnasium Odenthal: Unterrichtsmaterial Informatik – Mathematik** (http://projekte.gymnasium-odenthal.de/informatik/) Material: ITG-Folienpräsentation (ITG slide presentation) Arbeitsblätter (work sheets): http://projekte.gymnasium-odenthal.de/informatik/anzeige.php?site=&type=pdf&dateiname=Arbeitsblaetter.pdf&verlauf=Informatik/Informationstechnologische%20Grundbildung/Folienpraesentation/Arbeitsblaetter.pdf Beispielpräsentation (example presentation): http://projekte.gymnasium-odenthal.de/informatik/dateien/Informatik/Informationstechnologische%20Grundbildung/Folienpraesentation/Beispielpraesentation.zip Material: Arbeitsheft zur IKG Klasse8 – PowerPoint 97 (exercise book for IKG grade 8) http://projekte.gymnasium-odenthal.de/informatik/anzeige.php?site=&type=pdf&dateiname=Skript.pdf&verlauf=Informatik/Informationstechnologische%20Grundbildung/Folienpraesentation/Skript.pdf
Extent of the material	Website/directory of Mathematics and Informatics materials hosted by the Gymnasium Odenthal; The materials are sorted by subject and grades. The section of informatics materials consists of 15 sub-folders for different topics. Work sheets: PDF-file, about 1 page Example presentations: 2 ppt-files, about 9 pages in total Exercise book: 1 PDF-file, about 8 pages
Complete analysis or a partial analysis?	Work sheets: complete analysis of the PDF-file. Example presentation: complete analysis of both ppt-files. Exercise book: complete analysis of the PDF-file
Short description	Work sheets: Worksheet about the Power Point programme. Example presentation: The zip-file includes two example presentations created with PowerPoint. Exercise book: Introduction into using PowerPoint
Pictures/ Text	Work sheets: No pictures/ No personal/neutral expressions. Example presentation: Only male persons on pictures; balanced ratio between female/male persons in text; no neutral expressions. Exercise book: Pupils are addressed directly in the texts; Few male/female expressions; no neutral expressions.

Anything else?	Work sheets: it is only one page with little text.

Name of the material	**Einheitliche Prüfungsanforderungen Informatik (EPA)**
Reference/ URL of the material	**Einheitliche Prüfungsordnung Informatik**; Beschluss der Kultusministerkonferenz vom 01.12.1989 i.d.F. vom 05.02.2004 Standard examination rules for informatics at school; resolution of the Standing Conference of the Ministers of Education and Cultural Affairs of the Länder in the Federal Republic Germany (version 05.02.2004). http://www.kmk.org/fileadmin/veroeffentlichungen_beschluesse/1989/1989_12_01-EPA-Informatik.pdf
Extent of the material	1 PDF-file, about 71 pages.
Complete analysis or a partial analysis?	Partial analysis of this PDF-file; only page 16-42 "Aufgabenbeispiele" (task examples) were analysed, not including text and algorithms in tables and graphics.
Short description	The agreement for the constitution of the gymnasiale Oberstufe (advanced level of grammar school, upper secondary level) describes the basic requirements for teaching mathematics, natural sciences and technology at school.
Pictures/ Text	No pictures with persons; only graphics/tables with e.g. diagrams and algorithms; no female expressions; few neutral expressions; many male expressions in text.
Anything else?	The graphics/tables included many male expressions (but were not counted for the analysis).

Name of the material	**LMZ Landesmedienzentrum Baden-Württemberg – Unterrichtsmodule**
Reference/ URL of the material	**Portal: LMZ Landesmedienzentrum Baden-Württemberg – Unterrichtsmodule** (http://www.unterrichtsmodule-bw.de) Material: Unterrichtsmodule – Werkstatt Computergrafik und Animation (workshop computer graphics and animation) http://www.unterrichtsmodule-bw.de/fileadmin/pdfs/Werkstatt_Computergrafik_und_Animation_Modulbeschreibung.pdf
Extent of the material	The website contains numerous modules for teaching at schools according to the curriculum of Baden-Wuerttemberg. The modules focus on general school education as well as vocational school education, and are sorted by type of

	school, grades, and topics The material "Werkstatt Computergrafik und Animation" comprises of 1 PDF-file, about 12 pages.
Complete analysis or a partial analysis?	Complete analysis of the pdf-file.
Short description	During lessons, the pupils create pictures with software and explain the themes, colours, tones, forms, lines, textures, perspectives, movements and shapes.
Pictures/ Text	No pictures with people on it; very balanced ratio between female/male persons
Anything else?	Pupils are mainly addressed directly in the analysed PDF material. Additionally, the complete LMZ – Unterrichtsmodule website is uses gender sensitive language.

Name of the material	**LMZ Mediaculture Online – Medienpädagogik und Medienkultur. Das Portal zur Medienbildung**
Reference/ URL of the material	**Portal: Mediaculture Online** (www.mediaculture-online.de) Material: Internet – Telearbeit (Internet, tele work) http://www.mediaculture-online.de/Internet.829+M5fb2cdca62b.0.html http://www.mediaculture-online.de/fileadmin/module/rs_internet_telearbeit/rs_internet_telearbeit.zip including: Linksammlung (collection of links); AB Begriff Telearbeit (the term tele work); AB Beispiele für den Einsatz von Telearbeit (examples of tele work); Lehrerinformation (teacher information); Bildungsplanbezug (curriculum integration); Modulbeschreibung (module description).
Extent of the material	The website provides extensive information on issues related to media education, including related links, references, information about specific media, and teaching modules sorted type of media and by school type, adapted to the school curriculums of Baden-Wuerttemberg. The material "tele work" consists of 4 Word-files and 3 PDF-files, about 10 pages in total
Complete analysis or a partial analysis?	Complete analysis of all PDF and Word files.
Short	The pupils learn about new forms of working and learning which can be realised with technology support. They become aware of advantages and risks

description	that result for future society.
Pictures/ Text	The pictures show only male persons; several examples use mainly male expressions

Name of the material	**Bundeswettbewerb Informatik**
Reference/ URL of the material	Bundeswettbewerb Informatik (http://www.bwinf.de) Material: 28. Bundeswettbewerb Informatik, Aufgabenblatt 1. Runde http://www.bwinf.de/uploads/media/aufgabenblatt281_simple_01.pdf
Extent of the material	The website contains Information about the Federal computer science competition in Germany, targeted at young people (below 22 years). Information about the history of the contest, the participation procedure, past events, etc. is provided. The tasks for the competition can be downloaded; the analysed material is the work sheet 1 of the 28th competition (1 PDF-file, about 12 pages).
Short description	The PDF file contains information about the competition as well as 5 tasks for the first round of the competition. These tasks are the "junior tasks" for participants not older than 16 years.
Complete analysis or a partial analysis?	Partial analysis of the work sheet (only page 5-10)
Pictures/ Text	No pictures with persons on them; balanced ratio between male/female expressions; more female persons in leading positions.

6.3 Offline teacher materials

Name of the material	**deutschwerk 1 – Realschule Lehrerband zum Arbeitsbuch für das 5. Schuljahr**
Reference/ URL of the material	Hunger, A., Rupp, A., & Winkelmann, A. (2004). deutsch.werk 1. Realschule. Lehrerband zum Arbeitsbuch für das 5. Schuljahr. Leipzig: Klett.
Extent of the material	1 book, about 143 pages
Complete analysis or a partial analysis?	Partial analysis of the book; 2 articles from different sections/topics have been analysed: Preface; Informing myself and others (p.4-5); Proposed solutions (p. 73-77)

Short description	Book for teachers with didactical and methodical comments, solutions of exercises, practical tips for lessons, and master copies (see also "offline pupil materials" – deutschwerk 1)
Pictures/ Text	No pictures. The text contains more men than women and men are in leading positions, e.g. "Emperor Augustus". The texts also contain some neutral expressions.
Anything else?	Indication of gender-specific differences in spare time- and media-behaviour of pupils.

Name of the material	**LOGIN – Informatische Bildung und Computer in der Schule Heft 154/155**
Reference/ URL of the material	LOGIN 154/155 2008
Short description	Construction of competence orientated exercises; inquiry of sets of exercises, examples of exercises for lessons of computer science and intentions plus deliberations of the authors of these exercises; Introduction into the theme of "Chatbots", electronically educational game about basic functions of distributed systems
Extent of the material	1 journal, 128 pages
Complete analysis or a partial analysis?	Partial analysis of the journal; 3 articles from different sections/topics have been analysed: Sets of exercises on trial (Aufgabensammlungen auf dem Prüfstand) by Peter Brichzin, Katharina Embacher, Martin Hölzel and Stefan Hörmann (p. 16-24); Exercises of schoolbooks for pupils of secondary education I (Aufgaben in Lehrbüchern für Schülerinnen und Schüler der Sekundarstufe I) Peter Brichzin, Helmar Fischer, Thomas Knapp, Ute Heuer and Markus Steinert (p.37 – 50); Chatbots – part I: Introduction into a teaching unit about "computer science in context" (Chatbots – Teil I: Einführung in eine Unterrichtsreihe zu „Informatik im Kontext") by Helmut Witten and Malte Horndung (p.51-60);
Pictures/ Text	Pictures on most pages of the journal, e.g. photos and drawings of people and authors of articles (mainly men, professors), some pictures illustrate the text. Leading positions are occupied by men only, e.g. Stammvater der Informatik (progenitor of computer science), Bürgermeister (major), Juroren (jurors)
Anything else?	Male and female expressions/leading positions from an example (description of Asterix-Comic) were counted; the name of the Chatbot "Anna" was not counted; The usage of the terms Schüler and SchülerInnen is not coherent, even within

	one text, e.g. some times the languages is gender-sensitive and both expressions are used; at other times only the male expression (Schüler) is used.

Name of the material	**LOGIN – Informatische Bildung und Computer in der Schule Heft 157/58**
Reference/ URL of the material	LOGIN 157/58 2009
Extent of the material	1 journal, 108 pages
Complete analysis or a partial analysis?	Partial analysis of the journal; 3 articles from different sections/topics have been analysed: History of ideas or archaeology – history of computer science – the invisible is the heart (Ideengeschichte oder Archäologie – Geschichte der Informatik – das Unsichtbare ist der Kern) by Ludger Humbert (p. 20-24); OXO – Spacewar! – Adventure, an action-oriented excursion into the history of computer games (OXO – Spacewar! – Adventure, Ein handlungsorientierter Ausflug in die Geschichte der Computerspiele) by Jochen Koubek (p. 57 – 64); Digital medias in education – News from the association "Schulen ans Netz" (Digitale Medien in der Bildung – Aktuelles vom Verein "Schulen ans Netz") by Dirk Frank (p. 84-85)
Short description	Impressions of the history of computer science; and the history of computer games. Papers and announcements of the association Schulen ans Netz e.V.
Pictures/ Text	Pictures on most pages of the journal, e.g. photos and drawings of people and authors of articles (mainly men, professors), some pictures illustrate the text; 1 group picture (18 men, 1 women); Male expressions are often used during the text, e.g. developer, user, teacher, etc.
Anything else?	The usage of the terms Schüler and SchülerInnen is not coherent, even within one text, e.g. some times the languages is gender-sensitive and both expressions are used; at other times only the male expression (Schüler) is used.

6.4 Online teacher materials

Name of the material	**lehrer-online - Unterrichten mit digitalen Medien**
Reference/ URL of the	**Portal: lehrer-online** (www.lehrer-online.de) Material: Roberta - Ein Projekt zur Mädchenförderung (a project for

material	facilitation/ advancement of girls Webpage: http://www.lehrer-online.de/roberta.php?sid=72507438443346570324584178417710
Extent of the material	The online portal "lehrer-online" contains several materials for teachers (e.g. on didactics). The material "Roberta – a project for the facilitation/ advancement of girls" was chosen from the didactics section in the subject area of business informatics. It comprises of 3 web pages, and it is only one of the numerous materials available on the portal "lehrer-online".
Complete analysis or a partial analysis?	The material "Roberta – a project for the facilitation/ advancement of girls" was analysed partially (this means links to additional materials were not analysed); the following sections were analysed: • the start page of the material "Roberta – a project for the facilitation/ advancement of girls" excluding the sections "information on the author" • the pages „Notwendigkeit der Mädchenförderung" (necessity of facilitating girls) and "Genderaspekte" (gender aspects)
Short description	The ROBERTA project has the motto „Girls take over robots". By utilizing special LEGO modules it aims at increasing the interest of girls and young women in techniques, natural sciences and informatics; and facilitating the understanding of technical systems.
Pictures/ Text	No pictures; text only
Anything else?	On the web pages of the material, the male and female form of words was used mainly, e.g. "Die Schülerinnen (female pupils) und Schüler (male pupils) erarbeiten…." The project described on the web pages was for the target group of girls/ young women. For this reason, female expressions occurred more often than male expressions.

Name of the material	**Landesbildungsserver BW – Bildung stärkt Menschen**
Reference/ URL of the material	**Portal: Landesbildungsserver BW** (www.bildung-starkt-menschen.de) Material: Bildungsplan der Realschule – Leitgedanken zum Kompetenzerwerb für Informationstechnische Grundbildung, Realschule, Klassen 6, 8, 10 http://www.bildung-staerkt-menschen.de/service/downloads/Bildungsstandards/Rs/Rs_ITG_bs.pdf
Extent of the material	The portal "Bildung stärkt Menschen" provides information for teachers on the education plan reform in Baden-Wuerttemberg in 2004. It includes information about related evaluation, counselling, literature, educational media, a glossary, etc. The analysed material was from the educational standards

	download section. It is a PDF-file with 5 pages.
Complete analysis or a partial analysis?	Complete analysis of the PDF-file.
Short description	Education-standards for basic education of information technology for grades 6, 8 and 10 of Realschule (secondary school/middle school); Principle for acquisition of competences; competences and contents for information technologically basic education.
Pictures/ Text	Only two pictures with people in it; Balanced ratio between female/male persons and neutral expressions.
Anything else?	The first page of the PDF (cover) shows a very large picture of a foreign-appearing girl using a computer; the second picture shows two boys in front of a computer in a computer classroom

Name of the material	**Landesbildungsserver BW – Schule Baden-Wuerttemberg**
Reference/ URL of the material	**Portal: Landesbildungsserver BW** (www.schule-bw.de) Material: Informatik EIN/AUS – Bildung (computer science on/off - education), by Werner Hartmann http://www.infosense.ch/hartmann/docs/informatik_ein_aus.pdf
Extent of the material	The Landesbildungsserver BW is an information platform for the publication of didactical and education materials for schools in Badem-Wuerttemberg. It provides materials for pupils (to be used during classes) as well as materials for teachers (e.g. theoretical background information about education topics). The analysed material was selected from the section "didactics of informatics", it is a PDF-file with 14 pages..
Short description	Article with background information about the sense of computer science lessons. Contains many excerpts of publications e.g. by computer-science experts. Explanation of negative aspects of the actual computer science lessons; helpful tips for organizing meaningful lessons.
Complete analysis or a partial analysis?	Complete analysis of the PDF-file.
Pictures/ Text	No picture with people on it; Female course instructor in one example.
Anything else?	Typical role of women in some parts e.g. females use an oven; women problems ICT applications

Name of the material	**Bildungsserver Hessen – Unterrichtsmaterial:Lernarchiv**
Reference/ URL of the material	**Portal: Bildungsserver Hessen – Unterrichtsmaterial: Lernarchiv** (http://lernarchiv.bildung.hessen.de) Material: Digitale Medien in Unterricht und Schule (digital media in lessons and school), by Gerhard Tulodziecki http://lernarchiv.bildung.hessen.de/medien/medienkompetenz/lehrerbildung/edu_28955.html http://www.uni-paderborn.de/fileadmin/kw/Institute/Erziehungswissenschaft/mepaed/downloads/tulodziecki/Soest.pdf Material: Die Angst des Lehrers vor dem Computerraum (teacher's fear of the computer room) http://lernarchiv.bildung.hessen.de/medien/medienkompetenz/lehrerbildung/edu_31838.html?show_all=1 http://www.lehrerfreund.de/medien/paedagogik/swr-angst-computerraum-07-2004.pdf
Extent of the material	The learning material archive is part of the offer of the education server of Hesse. It provides a large collection of materials for teachers and pupils for basic education, secondary school level, and vocational school education. The analysed materials were chosen from the section about media literacy/teacher education (medienkopetenz/teacher education). Digital media: 1 PDF-file with 16 pages. Teachers' fear: PDF-file with 7 pages
Short description	Digital media: Basics of media pedagogic and examples; computer based offers for teaching and learning; empirical studies about digital media and learning; conditions and basics of learning effectively by using digital media; learning- and working-standards for using media; e.g. for case- and problem-oriented learning; communication and cooperation; task descriptions for media and information technologies teaching. Teachers' fear: Information about the usage of new media and computers in lessons; helpful tips for teachers
Complete analysis or a partial analysis?	Digital Media: Partial analysis (only p.1-14) Teachers' fear: complete analysis of the PDF-file.
Pictures/ Text	Digital media: No picture with person on it; relative balanced ratio between male/female and neutral expressions. Teachers' fear: Many neutral expressions like LehrerInnen (male/female teacher); Balanced ratio between female and male persons n pictures

Anything else?	Digital media: Excerpts of textbooks; quotation of a girl with restricted knowledge about the computer Teachers' fear: Statement of a male teacher at the beginning ("I am not that crazy" to the question of the author, if he would use the computer room; Unrecognisable number of persons in some photographs

Name of the material	**mediaculture-online - Medienkompetenz**
Reference/ URL of the material	**Portal: mediaculture-online – Medienkompetenz** (http://www.mediaculture-online.de/Medienkompetenz.14.0.html) Material: 8 Milliarden Websites (8 billions of webpages) http://www.mediaculture-online.de/Medienkompetenz.14+M5155727f88b.0.html http://www.mediaculture-online.de/fileadmin/bibliothek/althaus_website/althaus_website.pdf Material: Medienpädagogisches Manifest (manifest of media pedagogic) http://www.mediaculture-online.de/Medienkompetenz.14+M5155727f88b.0.html http://www.mediaculture-online.de/fileadmin/bibliothek/niesyto_medienpaedagogisches_manifest/medpaed_manifest.pdf
Extent of the material	The website provides extensive information on issues related to media education, including related links, references, information about specific media, and teaching modules sorted type of media and by school type, adapted to the school curriculums of Baden-Wuerttemberg. 8 billions: 1PDF-file with 9 pages. Manifest: PDF-file with 6 pages (list with people who signed the manifest on pages 3-6)
Complete analysis or a partial analysis?	8 billions: Complete analysis of this article. Manifest: Partial analysis of the PDF-file (page 1-2)
Short description	8 billions: Article about the importance of protecting children and adolescents with regard to media usage; media literacy and the law; raising awareness/responsibility of parents and educators. Manifest: Manifest of media pedagogic published by institutions active in the area of media pedagogic and media education; the signers demand a sustainable integration of media pedagogic in all areas of education.
Pictures/ Text	8 billions: No Pictures; many neutral expressions; Manifest: No pictures; only neutral expressions in the text

Name of the material	**Niedersächsischer Bildungsserver**
Reference/ URL of the material	**Portal: Niedersächsischer Bildungsserver** Material: Grundlagen der Medienbildung (basics of media education), http://www.nibis.de/nibis.phtml?menid=1609
Extent of the material	The Niedersächsischer Bildungsserver provides information on educational issues at school level in Lower Saxony. The analysed material was selected from the section "Portal Medienbildung" (basics of media education), which includes also a sub-section on gender and media. The material "Grundlagen der Medienbildung" consists of 11 web pages, 10 of them provide short text-based information on the topic, and 1 page provides additional reading material.
Complete analysis or a partial analysis?	Analysis of the following 10 menu items: 1. Wandel der Medienpädagogik (change of media pedagogic) 2. Medien, Pädagogik, Schule (media, pedagogic, school) 3. Medienpädagogische Ansätze (approaches of media pedagogic) 4. Medienbegriff (the term "media") 5. Erweiterter Textbegriff (the term "text" from an extended perspective) 6. Medienkompetenz + Kulturtechnik (media literacy + cultural techniques) 7. NT und Allgemeinbildung (new technology and general education) 8. Lernen mit Medien (learning by using media) 9. Medienerziehung und -didaktik (media education and media didactic) 10. Integrative Aufgabe (integrative purpose/functions)
Short description	1. Information about media-education for teaching of media literacy and the paradigm shift in media pedagogic 2. The Lower-Saxon approach of media education 3. Review of the media pedagogical approaches of the last few decades as background for the current discussions 4. Explanation of the term "media". 5. Explanation of the "text" from an extended literacy perspective: reading and writing literacy needs to include media reading and media writing literacy. 6. Explanation of the term "media literacy as cultural technique". 7. The importance of new technologies as modern key technology; appeal to schools to meet the resulting challenges. 8. Thinking about existing ideas of learning with media. 9. Explanation of the actual importance of the terms media didactic and media education. 10. Supporting pupils to acquire competences for using media.
Pictures/ Text	None of the webpages shows any pictures. All information is provided in short texts. (1) Some male expressions; but principally neutral expressions

	(2, 4, 5, 6) No person related expressions at all (3, 8) Balanced ratio between male and female expressions. (7) More male persons in the text because of an example. (9) Two neutral expressions (10) Many neutral expressions; balanced ratio between female/male expressions

Name of the material	**Schulen ans Netz**
Reference/ URL of the material	**Portal: Schulen ans Netz** (www.schulen-ans-netz.de) Material: Learningdelphi 2009 (learning delphi method 2009) http://www.schulen-ans-netz.de/meldungen/aktuelles/learningdelphi2009.php http://www.mmb-institut.de/2004/pages/trendmonitor/download/MMB-Trendmonitor_2009_I.pdf Material: Medienkompetenz und Digitale Kluft (Media literacy and digital divide) http://www.schulen-ans-netz.de/meldungen/aktuelles/medienkompetenzunddigitalekluft.php Besser Lernen mit Computer und Internet (Improved learning by the use of computer and the internet) http://www.schulen-ans-netz.de/themen/lernenmitdigitalenmedien/besserlernen.php
Extent of the material	The association "Schulen ans Netz" is a competence centre for the application of media in education at school and in extracurricular education. The association provides information, further education, materials for learning and teaching with digital media. Delphi: Article sprawls about 1 web page; including 1 PDF, about 9 pages. Media literacy: Article sprawls about 1 webpage (summary of the results of a usage survey conducted by "Schulen ans Netz", and summary of the 300-pages final report of the Delphi survey "future of ICT and media). Improved learning: Article sprawls about 1 webpage, based on Themendienst von Schulen ans Netz, Ausgabe 2 - 2005
Complete analysis or a partial analysis?	Partial analysis of all three the material; only the text on the web page was analysed for each material, not including the PDF-files and further links.
Short	Delphi: Learners are using web 2.0 for learning at increasingly; the Delphi survey about the future of ICT and media shows that the basis of E-Learning

description	still will be blended learning and web based training offers. Media literacy: The result of the user survey show: many, but not all users of the Schulen-ans-Netz offers consider themselves as competent in the use of media; The Delphi survey about the future of the information society lays emphasis on the importance of media competence. Improved learning: Argumentation of the 2005 educational debate about the implementation of new media at school, discussed by Dirk Frank.
Pictures/ Text	None of the analysed materials includes any pictures. Delphi: More male expressions; some female/neutral expressions. Media literacy: only mentioning of male and neutral expressions Improved learning: no female expressions; only male and neutral expressions
Anything else?	Delphi: Many male expressions because the male form of expert (Experte) is often used in the text. Improved Learning: Male form of pupil (Schüler) is often used.

Annex 3 – Analysis Scheme

Name of Resource	Complete vs. partial analysis
Please use the same name as in the PREDIL Resource Library	Please provide details on the excact object of analysis here, e.g. Complete analysis vs. partial analysis (which part? why?); What is the extent of the resource/ part of the resource? (e.g. number of chapters/ pages, linked websites/ sub pages)?; Does the resource/ part of resource contain text only/ pictures only/ both? Anything else that you feel is necessary for understanding the results!

pictures			
men in pictures	**women in pictures**	**men in leading positions**	**women in leading positions**
Count the overall number of men and women (e.g. photos, drawings or words that occur) on all pictures/ in all illustrations/ graphics		Count the number of men shown in leading positions on pictures/ in illustrations/ graphics, e.g. a male doctor and a female doctors' assistant , a male manager and a female assistant	Count the number of women shown in leading positions on pictures/ in illustrations/ graphics, e.g. a female doctor and a male doctors' assistant , a female manager and a male assistant

text					
male person	**female person**	**men as acting persons**	**women as acting persons**	**men in leading positions**	**women in leading positions**
Count the overall number of male/female persons in texts. A person who is named several times during a text counts each time!		Count the number of men and women which are the main agents/ acteurs in the described situation (who is described as doing something, e.g. in a task description, in a lesson plan). A person which conducts several actions/ activities during a text counts each time!		Count the number of men/women which have a leading position in the described situation. A person described as having a leading position several times during a text counts each time!	
sexist female expressions		**neutral expressions**			
Count the number of sexist expressions, e.g. housemaid (sexist) vs. domestic worker/ servant (non-sexist). An expression which occurs several times during a text counts each time!		Count the number of expressions that refer to both - men and women - without further specification of the sex (might be relevant in some languages only), e.g. guests, children, pupils, people, Lehrer/innen, they. A neutral expression which occurs several times during a text counts each time!			

> do not count expressions which address the reader personally, e.g. "you"
> if some expressions, pictures, described action etc. are not clear, leave it out