

Reverse-mentoring in school – a way to deconstruct gender related stereotypes in ICT

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Abstract

The project *re-ment* aims at raising the interest of female students for Information and Communication Technology (ICT) professions and at contributing to the deconstruction of gender stereotypes in this field. This reverse-mentoring approach offers a completely new and innovative perspective in the field of gender equality and advancement of girls in technology. This paper describes the major steps of this project and how reconstructive picture interpretation can be used for evaluation. The project implements reverse-mentoring programs in four partner schools in Austria, the main result being a comprehensive course for teacher education.

Keywords:

Reverse-mentoring
ICT competences
Gender gap in IT

1 Introduction

Re-ment was a research project that developed and implemented a reverse-mentoring approach in four upper secondary schools in Austria. The aim of the project was to raise girls' interest in ICT and sciences professions and to make them aware of their competences in this field. In order to achieve this aim, a reverse mentoring program was designed and applied, which started in October 2015 and ended in September 2017.

Reverse-mentoring turns the traditional mentoring concept upside down. As outlined by Bozeman and Feeney, mentoring takes place between a mentor, who is "a person who is perceived to have greater relevant knowledge, wisdom or experience" and a mentee, "a person who is perceived to have less" (Bozeman & Feeney, 2007, p. 731).

This project addresses the gender specific segregation in ICT and offers a new, resource-oriented approach to support gender equality in this field. Although a lot has changed in the past decades, gender specific segregation still exists and the number of women working in this field is still considerably lower compared to men. Consequently, the aims of re-ment are to empower women in the ICT sector as well as to build a renewed image of this sector among women and mainstream society.

In re-ment, female students, aged between 16 and 17, who have higher competences in ICT are mentors and teachers or parents are mentees and, therefore, the project re-ment opens new perspectives and equal opportunities for the girls. In the course of the winter semester 2016 mentors and mentees met on a regular basis to discuss ICT questions that were asked by the mentees. This reverse-mentoring approach was implemented in four secondary schools in Austria: Hertha-Firnberg-Schulen, BRG Gröhrmühlgasse, BG/BRG Mödling-Keimgasse, BG/BRG Purkersdorf. For the purposes of the research project re-ment, reverse-mentoring is defined as

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“Reverse-mentoring is a specific form of mentoring and refers to a reciprocal and timely stable developmental partnership between one or more less experienced mentor/s providing specific expertise and one or more experienced mentee/s who want/s to gain this knowledge. The partnership is characterized by reciprocity and mutual respect and it aims at both, the development of the mentors and the mentees. In applying a networked perspective, it may take advantage of digital technology.” (Zauchner-Studnicka, 2015, p. 51)

As a matter of fact, reverse mentoring often implements ICT related issues as younger people are the digital natives and, therefore, are able to support older people with the latest developments in ICT. As outlined by Prensky (2001) this is an innovative way to encourage learning and both – mentors and mentees – will benefit. In the course of the implementation and evaluation of re-ment as well as interviews with mentors and mentees, that were conducted, similar experiences were observed. Both, mentor and mentee, learnt a lot on many different levels. An overview of the results and evaluation will be outlined in Chapter 3.

Although reverse-mentoring is an internationally well developed and often used method, it is mainly used by private businesses and corporations. However, there are some examples where this method is used in an educational environment. There are two well spread projects in the USA that make use of the reverse-mentoring concept and focus on ICT competences of pupils and students (Hsueh-Hua Chuang and Ann Thompson, 2005, cited by Peterson, 2012). In these two projects, pupils and students act as a kind of help desk regarding ICT questions to support school management staff or teachers. These two projects are called Mouse (Making Opportunities for upgrading Schools and Education) and GenYES. Mouse’s mission is “to empower students to create with technology to solve real problems and make meaningful change in our world.” One central focus of Mouse is on “creating more diversity in STEM (Science, Technology, Engineering and Mathematics) [...]” (<https://mouse.org/>). GenYes aims at “closing the digital divide and empowers students to become leaders in their schools by using technology to solve crucial problems in education, while also becoming interested in STEM careers” (<http://genyes.org/>). The benefit outlined by Peterson is that teachers and management staff profit from the ICT support and pupils and students profit from the preceding trainings that they received by professional mentors (Peterson, 2012). As a consequence reverse mentoring implements a high potential for innovative improvements in educational settings, especially in ICT.

This paper aims at describing how a reverse-mentoring program was applied in four schools in Austria and it discusses results and experiences that were made during the implementation. First of all, major steps will be outlined to illustrate the way how the project was conducted. Secondly, in the evaluation chapter significant results will be demonstrated and explained. Finally, the conclusion sums up what has been learnt so far and a future outlook will be presented.

2 Description of the Project – Major Steps

The reverse-mentoring program took place in the winter semester of 2016 in the four partner schools mentioned above. This chapter summarizes major steps that were taken during this semester and also the importance of each step is highlighted. Before the reverse mentoring sessions between the girls and the mentees took place, meetings with school coordinators were organized, coaching sessions took place and kick-off meetings signaled the start of the project. The active reverse-mentoring phase, where mentors and mentees met, took place from October 2016 until January 2017. Most of the experiences gained by mentors and mentees were highly positive and during the closing conference the tandems presented their results and were proud of what they had achieved. Finally, the closing conference in September 2017 at University College of Teacher Education in Lower Austria ended the project.

2.1 Meeting with School Coordinators

In September 2016 the active phase of re-ment started with the meetings with school coordinators. Their role in the project was fundamentally important because they were responsible for informing everyone involved and they acted as a vital link between the project team members and the girls. Apart from communication, organization, and being the contact person for everyone, they were also responsible for selecting and choosing the girls who should then participate in the project.

2.2 Coaching Sessions

After the girls were selected, they attended coaching sessions to prepare for their role as a mentor. The coaching sessions were based upon the systemic-constructivist approach and the main aim was to make the girls aware of their strengths in general and their ICT strengths in particular. The coaching sessions took place in schools with professional coaches and according to the girls, they were interesting and helpful. For example, the concept of the Tree of Life was used and the results were highly interesting. Some examples that were designed by the girls are presented in the picture below.



Fig. 1: Tree of Life

2.3 Kick-Off Meetings

With the Kick-Off Meetings in schools the reverse mentoring phase of the project started because mentors and mentees met for the first time and the matching took place. Mentoring experts argue that the selection and preparation process as well as the matching is fundamental for successful mentoring (Kram, 1983, 1985). Apart from mentors and mentees also school coordinators, project members and principals of each school attended the kick-off meetings. They took place in October 2016 and the aim of those meetings was to officially start the project and to agree on the mentoring objectives. Moreover, forms were introduced to mentors and mentees to document the mentoring process and they were asked to keep minutes of each mentoring meeting. They were explicitly asked to use the last ten minutes of every mentoring meeting for reflection and to document the progress.

2.4 Implementation of reverse-mentoring in schools

In the course of the winter semester 2016/17 girls and their mentees met to discuss ICT questions that were chosen by their mentees. Girls stepped into the role of a mentor and worked with the teachers, parents or retired people, who were their mentees. On average, the tandems met 5 to 8 times and the duration of each meeting was approximately one hour. Some of those meetings took place in schools, for example in the computer room, some meetings were held outside the school campus. The topics that were discussed and explained included for example the use of Excel, Word, Power Point, Photoshop, Gimp, File management, Skype, or Social Networks (Facebook). Moreover, many mentees asked questions related to their mobile devices such as personalization or

transferring data, especially pictures. Summing up, it can be argued that most ICT questions were related to personal issues such as pictures, household budget, staying in contact with family and friends, or online teaching material.

Apart from face-to-face meetings, mentors and mentees got the chance to communicate online via yammer, which is a social network (www.yammer.com) that is mainly used by businesses and provides a protected environment to communicate for all participants. If the mentoring process takes place online, it is referred to as e-mentoring which is defined as “a special form of mentoring where communication takes place online, at least partly” (Stöger, 2009, p. 229). According to Giddens and Phillips, “Reverse mentoring is an innovative way to encourage learning and facilitate cross-generational relationships [...] The most positive outcome for us was, that web 2.0 was a catalyst for the strengthening of our professional relationship, underpinned by deeper levels of honesty, trust and respect for each other.” (Giddens & Phillips, 2009, p. 9)

2.5 Closing meetings and closing conference

The final step of the reverse-mentoring program was the organization of the closing meetings in schools which officially ended the reverse mentoring program in the project schools. Tandems got the chance to present their results of the reverse-mentoring program and to talk about their experiences. Some presentations were excellent because mentors made use of what they had learnt during the mentoring sessions and prepared presentations using new technology. After the presentations, an evaluation workshop with the mentors was conducted and finally they received their certificate as shown in the picture below.



Fig. 2: Closing Meetings in Schools

In September 2017 the closing conference was the final event held at University College for Teacher Education in Lower Austria. Project results and experiences were presented to a broader audience, including teachers, university college staff, people working for the Austrian ministry of education, and everyone interested in the concept of using a reverse mentoring program in school. This conference was divided into two parts, key notes and a world café. The key notes were held by experts in the field of gender specific segregation in ICT and gender inequalities from Germany and Austria. The world café was an interesting activity for all participants to be actively involved in discussions related to current trends and developments in this field.

3 Evaluation

In the context of mentoring, research projects researchers often neglect to include all involved persons in their analysis (Ziegler, 2009). Therefore, it was important for the researchers of the project re-ment to obtain the visibility of all groups involved in the reverse mentoring program. For this, the coaches' and school coordinators' perspective was raised by a group discussion. Additionally, at the end of the program the experiences of the mentees were raised by guided interviews. Furthermore, the mentors completed an online survey before and after their activities. With this pre and post questionnaire data about the girls' technological self-concept (Jannek et al., 2012) and about their social competences (Grob & Merki, 2001) were gathered. Finally, the participative evaluation workshop with the girls was particularly important to gain deeper insights in their mentoring experience. Altogether an extensive quantitative and qualitative approach was chosen to evaluate the program. The following sections outline the method applied to analyze the paintings the girls have made at the evaluation workshop and summarize the findings in this regard.

3.1 Reconstructive Picture Interpretation

In social and educational sciences, especially in the field of youth and gender research, methods of image interpretation have become established in recent years. These methods open up access not only to the reflexive, but also to the action-guiding knowledge of the actors and thus to the practice of completed actions (Bohnsack et al., 2012, p. 9). For this reason, we invited the girls to trace the period of the reverse mentoring project from the beginning to the end (see Fig. 3).



Fig. 3: Reverse-mentoring experience



Fig. 4: Planimetric Composition

3.1.1 Iconic Interpretation – Planimetric Composition

The method of the reconstructive picture interpretation always starts with the examination of the planimetric composition. Because the planimetry of a picture makes the obstinacy of it visible (Przyborski & Wohlrab-Sahr, 2014, p. 342). Lines (so called "Feldlinien") help to reconstruct the structure of the image and they make the whole composition amenable for the interpretation (see Fig. 4). The horizontal line in the center of the picture, divides it. In the lower half, the plant grows on a ground of respect. In the upper half, the watering can (motivation and pleasure), the water and the sun (comprehension and communication) ensure that the plant in the lower half thrives.

3.1.2 Iconic Interpretation – Scenic Choreography

The step of the "Scenic Choreography" is used to examine the proportions of different picture elements and to see how persons and objects are arranged. Hence it is also possible to move and omit picture elements. The goal of the "Scenic Choreography" is to capture the balance of the picture (Przyborski & Wohlrab-Sahr, 2014, p. 344).

The picture shown above (Fig. 3 and Fig. 4) has three elements (plant, watering can, sun) which are approximately the same size. Neither of these elements can be omitted without altering the statement of the picture.

3.1.3 Holistic Interpretation

This picture clarifies, what the essential basic prerequisites are for a successful reverse-mentoring program. Reverse-mentoring can therefore thrive on a respectable basis. Understanding, communication, motivation and pleasure ensure the growing of the plant. The growth, symbolized by the plant, affects both sides – the mentor and the mentee. Reverse-mentoring thus works when a basic attitude is determined by benevolence and trust on both sides. According to the systemic-constructivist approach, it can be concluded that people always have the competence and the resources for an independent solution of their problems.

4 Conclusion

In conclusion, reverse mentoring opens up a new perspective to address gender specific segregation in ICT and to deconstruct the image of this sector among female students in particular. Girls stepped into the role as mentors and supported their mentees – parents, teachers, or retired people – in ICT questions. Through coachings, mentors were well trained and prepared for their role as a mentor. According to the girls, those coachings were highly important to make them aware of their strengths and to prepare them for the following weeks. Almost all girls enjoyed their role as mentors and mainly positive experiences were reported. Therefore, it can be concluded that it makes sense to implement such a project in schools as it demonstrates a completely different approach.

The impressions and experiences gained by the girls were illustrated by pictures that demonstrated a great variety of diversity and an unexpected depth from a content point of view. Although the method of reconstructive picture interpretation is a lot of work, the results were remarkable. With the help of pictures it was possible to show in depth thoughts which would not have been possible during simple conversations.

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