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**INITIATING AND SUSTAINING FEMALE NETWORKS IN
COMPUTER SCIENCE AND IT**

Maria Oelinger and Annika Hinze

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Department of Computer Science
The University of Waikato
Private Bag 3105
Hamilton, New Zealand

Initiating and Sustaining Female Networks in Computer Science and IT

Maria Oelinger
University Duisburg-Essen,
Dept. of Computer Science and Applied Cognitive Science,
47057 Duisburg, Germany,
maria.oelinger@uni-due.de

Annika Hinze
University of Waikato,
Dept. of Computer Science,
Hamilton, New Zealand,
hinze@cs.waikato.ac.nz

Abstract

Over the last decade, several networks and communities for women in IT have been initiated. It has been known that specific needs for support exist where members of a minority have difficulties in finding like-minded people in their everyday environment. This paper investigates different forms of female networks in Computer Science and IT. In particular, it analyses forms of network initiation, which often involve face-to-face meetings at regular events like conferences or, increasingly, at summer universities for female students. We conducted three studies to identify the attendees' expectations and needs for support using questionnaires, interviews, and a wiki analysis. This paper aims at identifying effective strategies for initiating female networks.

Keywords

Women in Computing, female networks, mentoring, female support in IT communities

1 Introduction

The need for female networking in a professional context, as well as in education, has long been identified. In general, a specific need for networking can be identified where members of a minority have difficulties in finding like-minded people in their everyday environment. Examples are known from Hispanic or Afro-American employees in a mainly white environment, or special interest groups that cater for specific subgroups of a larger organisation (e.g., the ACM SIGs). For our target group of women in the domains of Information Technology (IT) and Computer Science (CS), these needs have begun to be addressed in various ways over the last decade. The following list highlights the different ways and the wide range of countries of origin:

- series of discrete events such as summer universities or congresses: Informatica Feminale (Germany, annually, since 1997), ditact (Austria, annually, since 2003), Computing Women Congress (New Zealand, annually/biennially, since 2005), Grace Hopper Celebration (USA, triennially/biennially/annually, since 1994)
- rather small but highly effective projects for women in IT: MUFFIN21 (Germany, mentoring project), WIT (Austria, research career project), PROVEN (Germany, research career project)

- dedicated global or national organisations: WITI Women in Technology International (Leighton 1989), national Women in Technology branches (e.g., in New Zealand and Australia,)

In this paper, we focus chiefly on the creation and evolution of self-organised communities which have arisen from single or infrequent face-to-face events. We present and discuss various forms of both initial events and continuing networking activities. To convey the flavours of the different forms, we initially illustrate a selection of existing networks, their history and perceived effectiveness.

The study focuses on two specific forms of community initiation: summer universities and congresses. They are not the only forms of community initiation, but female-only summer universities and congresses are becoming more and more popular and widespread (Oechtering et al. 2004); they target a wide variety of female backgrounds, and appeal to a large number of women in IT (judging from the number of attendees). We therefore identify these two forms of initiating events as our starting point for investigating the effectiveness of networking events for women in IT and CS.

The paper is organised as follows: Section 2 introduces examples of female communities and networks. Section 3 describes initiating events for communities and networks. Section 4 details the three studies that we undertook; we report on the results of the studies and illustrate how the studies will contribute to the larger aim of evaluating and designing effective communities for women in CS and IT. Section 5 compiles the major findings of our three studies. Section 6 draws conclusions and briefly lists future plans.

2 Examples of Events and Communities

The following selection of events and communities is related to our study participants. These particular examples were named and/or experienced by the participants of our study. Acknowledging the personal aspects of networking and community building, we aim at capturing experiences, preferences and personal stories and histories. The introduction and description of the events/communities on one hand allows further insight and understanding of the motivation of attendees, and on the other hand provides a list of concepts and ideas that may inspire further networking events. Whenever an event is open for men and women, this is explicitly mentioned in the section; all other events are female-only.

2.1 Summer Universities

Summer universities are, compared to congresses, more intense events. They typically last one or two weeks during the academic holidays. All summer universities offer both a professional program and a social program.

INFORMATICA FEMINALE – female computing summer university. The Informatica Feminale (Vosseberg and Oechtering, 1999; Oechtering et al. 2004) is a German national approach, initiated and developed by Veronika Oechtering and Karin Vosseberg in the early nineties. Its aim is two-fold: on one hand it works towards gender-aware curricular reforms as well as reforms in educational settings. On the other hand, this approach promotes and supports women scientists in academic careers. The main fields of action are summer universities for women in computer science, but a similar event has recently been developed

for female engineers. Since 1997, every year more than 70 female lecturers from universities, research, and industry pass on their expertise during summer courses at the University of Bremen. For two weeks during the university's summer break, they teach courses on computing topics with a strong orientation to existing university curricula. The vast majority of the course participants are female students, who can earn course credits that are accepted at their home universities. Furthermore, the summer courses are also offered to business women who are interested in further education on university level. Each year, around 200-250 participants attend Bremen's Informatica Feminale. Starting 2001, an additional one-week summer university is organised in southern Germany as a regional activity: the venue alternates between the Applied University of Furtwangen and the University of Freiburg. There, about 40 lecturers and 150 students participate each year. This summer university has a stronger focus on undergraduate students. The Informatica Feminale allows men to attend the opening ceremony and keynote; further keynotes may be open to the public. The opening keynote is regularly attended by men (typically, the hosting university is represented by a man). The other keynotes almost never had any male attendees. One year, a male visitor had to face several women complaining about his presence; he left and the keynote was held female-only.

DITACT – women's IT summer studies. ditact is a two-week IT summer university (Oechtering et al. 2004) for female students and scientists, mainly from Austria. Since the project started in 2003, ditact has followed the approach of women teaching women as applied in the Informatica Feminale. The project has been running since 2003. The project goals are increasing the rate of female students in CS and IT-related higher education, decreasing female drop-outs in IT-related higher education, raising the number of female instructors and researchers, networking and cooperating, and the participation of women in information and communication society on equal terms. Participants can choose from over 60 courses in different IT fields. They are taught by female professionals, who also act as role models. About 150 participants attend ditact each year.

COMPUTING WOMEN CONGRESS – female computing summer university. The Computing Women Congress (Hinze 2005, Oechtering et al. 2004) is the first Pan-Pacific congress for women in IT. Even though a congress by name, the CWC follows the model of the Informatica Feminale. Locally, the term summer school or summer university is reserved for summer courses as part of the university curriculum. The CWC takes place for two weeks during the (southern) summer. In 2005 and 2006, more than 50 participants attended the CWC; two thirds came from the Pan-Pacific region. The CWC is designed as an (bi)annual series of conferences that combine an informal environment with technical excellence.

The Computing Women Congress is a summer university that aims to increase the skills, self-image, participation and representation of women in computer science and information technology. It aims to provide role models for those early in their computing careers and also a meeting place for those well into their careers.

CWC provides an open, explorative learning and teaching environment. Mostly, the CWC offers highly intense teaching environments of very small learning groups of two to five participants. Experimentation with new styles of learning is encouraged, with an emphasis on hands-on experience and engaging participatory techniques. Finally, by providing an arena in which women can share ideas and build supportive networks, CWC fosters the confidence and recognition of women in the area of computer science and IT. In addition to workshops and lectures, the CWC 2006 offered a well-received student day where postgraduate students could present their project work. For most of the presenting students, these were their first

presentations at a conference. The goal is to build a continuing community of women in IT for New Zealand and the Pan-Pacific region.

2.2 Congresses and Conferences

Congresses or conferences are – like summer universities – events which focus on talks, presentations, and lectures in a field. However, the numbers of participants, the offered presentations, as well as the particular goals of the events differ from those of summer universities. We observed that the evaluated congresses and conferences included a higher number of presentations on gender politics than the summer universities. The congresses offer a professional program and a number of social meetings.

GRACE HOPPER CELEBRATION OF WOMEN IN COMPUTING – congress for women in IT. The Grace Hopper Celebration of Women in Computing (Borg and Whitney 1994) has taken place as a series of conferences. It has been initiated by Anita Borg and is supported by the ACM. The conferences are designed to bring research and career interests of women in computing to the forefront. Presenters are leaders in their fields, belonging to industrial, academic and government communities. Leading researchers present their current work, while special sessions focus on the role of women in today's technology fields. Grace Hopper Celebrations have resulted in collaborative proposals, networking, mentoring, and increased visibility for the contributions of women in computing. It takes place every two years (from 2006/07 on every year) for three days. Men are allowed to attend the Grace Hopper Celebration. The GHC 2006 had about 1200 participants, most of which from the USA.

FINUT – Kongress Frauen in Naturwissenschaft und Technik. The congress for women in science and technology was initiated in 1977. FiNuT takes place every year for four days during a long public holiday weekend. The presentation topics range from experience exchange in professional talks to political discussions. The participants mainly come from German-speaking regions: Switzerland, Austria, and Germany with some participants undertaking a long journey to attend the congress. The participants' backgrounds range from high school girls to retired women, from craftspeople to professors. There are also special interest groups, e. g. FiNuT-IT. In recent years, the number of participants was about 300 to 600. Each congress provided over 100 different activities: talks, workshops, field trips, network meetings. The congress' themes (e.g., “turn of the tide”, “effective provision”, “balance domain justice”, “providing sustainability”, or “standard:deviation”) serve as the focus of each activity. Social events, such as a party, help in initiating more personal contacts.

AUSWIT – Australian Conference for Women in IT. The Australian conference has seen its 10th instalment in 2006. AusWIT has a mission of informing, sharing, community building, and re-energising those involved in the recruitment and retention of women in information technology. A wide range of participants attends the AusWIT conferences: representatives from industry, government, and education at all levels attend and join in discussions. The presentations focus on specifically Australian topics as well as on general issues in girls/women in IT education. The conference typically takes place for two days close to or as part of a national IT conference.

2.3 Communities of Interest

Communities of interest focus strongly on the personal level. They are often privately initiated and might change focus over time.

ONLINE NEWSPAPER (ZEITUNG) for women in IT (project/editorial board). Originally set up for two weeks during an Informatica Feminale summer university in 2000, the zeitung developed into a mainly virtual editorial board for an IT-related online newspaper for women in IT (Oelinger 2000). Despite the fluctuation of the active journalists, the network has been successfully sustained. Some members have continued working on the editorial board for more than six years. One important precondition is the group's openness for new as well as previous members. The group extended its supportive character into their members' professional life. For example, one board member emigrated and took on a professorship overseas. A second one followed and wrote her master's thesis there and is now returning for her PhD. From within the group, further co-operations in research and industry were initiated, e.g., for a study project in Sweden and several research visits. At another level, the group's members provide each other with technical support regarding questions like "how to install a Wiki", "how to write in LaTeX", "which Linux distribution can you recommend", but also in more methodical questions like "how to write a scientific paper".

CCC Haecksen (Chaos Computer Club Congress - female hackers' corner). The Haecksen (Tangens and Thoens 1988) is a group of female hackers; the group's name is wordplay on "witches" in German. The group recruits its female members from the German Chaos Computer Club (CCC). It was founded in 1988 by Rena Tangens and Barbara Thoens. They meet once a year at the Chaos Communication Congress of the CCC and organise female-only presentations and workshops there. Their main communication tool is a mailing list. The aim of the Haecksen is to prove that girls and women can handle technology naturally in a creative manner and that the typical image of hackers – "hackers must be male" – is incorrect.

2.4 Professional Communities

Professional communities are funded programs which support the career skills of women. Some focus on research and academics, some have mixed target groups (industry, business, and research; like MUFFIN21). A large number of smaller initiatives exists. We describe some of those which the participants of our study identified.

MUFFIN21 – mentoring within the "Initiative D21". The women mentoring program MUFFIN21 (MUFFIN21, 2000-2003) was funded by the German National Research Centre for Information Technology (GMD); it initiated and supported relationships between mentors (women from both industry and research) and their mentees (female students of computer sciences). MUFFIN21 started as a one-year pilot project with only a few members and continued for two more years with a larger number of members. Overall 31 mentors and 29 mentees participated in the project. Beyond the mentorship pairs, MUFFIN21 supported its members with workshops in soft skills and gave financial help for travel. After the official end of MUFFIN21 in 2003, a group of women kept in close contact. They still exchange information and advice regarding political decisions concerning their individual careers. The web platform used during the project was closed at the end; contact was maintained via a mailing list. Through this list the former mentees and mentors keep the professionals' network alive. One of the results of the project was the publication of a mentoring handbook.

PROVEN – network of women in the faculty of engineering. This is an example of a low-key network. The organisation of a Girls' Day connected a number of women who had previously worked separately in IT-related departments at the University of Duisburg-Essen, Germany. A network was founded during the post-event meeting of Girls' Day 2004. A regular lunch meeting was initiated – fostering a growing community which is by now also virtually connected via a forum, a wiki, and a mailing list. Also established have been evening meetings which provide the ground for profitable table talks. After a series of professional meetings, events outside the limited professional context were started. Recently changes in the members' careers (some have left the campus and became business IT professionals) have initiated career-related discussions. The advantages are closer relationships amongst the women and, therefore, an intensification of the community. The Proven network has been cited as a “best-practice-example” and the group became known beyond the borders of the university's campus. After the first year, the University of Duisburg-Essen awarded a grant for organising workshops (presentation techniques in engineering, leadership, time management, fundraising, business studies for engineers) in appreciation of the efforts of the members of the network (Lücke and Simons 2005). The group focuses on career skills for women in a technical profession.

WIT – Women in Internet Technologies. This project provides a female-only PhD programme in the field of Internet technology. It started in 2003 and will end in 2007 (TU Vienna 2003). The purpose of the programme is to foster female research activities. This training includes teaching hardware courses for school girls or representing the TU Vienna on open days. The programme also aims at monitoring and furthering the success of female students by providing additional workshops to enhance technical skills (e.g., databases, Linux), to inform girls about IT as a career option, or to engage in mentoring for female academic beginners in their first semester (related to the project “big sister.first steps”). WIT also offers a series of presentations by international, high-quality guest researchers (e.g. Alan Bundy, University of Edinburgh; Lenore Blum, Carnegie Mellon University; Wendy Hall, University of Southampton and currently vice president of the ACM).

3 Events to Initiate and Sustain Communities

For events initiating communities and networks, we focus on two forms: summer universities and congresses. Both offer the opportunity of regular face-to face meetings, typically once a year. Driving questions for the authors were: Are these events successful? Which form is more appropriate? What do participants gain, what is missing? In this section we describe both event forms. The setup and results of the evaluation of existing events are reported in the next section (Section 4).

3.1 Summer Universities

Female-only summer universities (such as Informatica Feminale, ditact, CWC) last a week or a fortnight; they offer courses mainly designed for university students. Course lengths vary between weekly, half-weekly and a few hours; usually with a large focus on hands-on experiences and new (and sometimes unconventional) forms of teaching. For most events, the organisers aim for courses that can be recognised by universities as part of their curriculum. This allows the female students to do parts of their university studies in a female-only environment. The course topics range from programming (e.g., Java, C++, Perl, AJAX, programming robot dogs, design of databases) to career competencies (e.g., scientific writing skills, identifying one's skills, executive management skills), from teaching techniques

(creativity methods, how to talk) to state-of-the-art research (e.g., robotics, artificial intelligence, wearable computing). Typically, the courses aim at addressing specific needs that are recognised but not sufficiently catered for at the students' home universities. The particular needs of female students have been widely discussed (see, e.g. Margolis and Fisher 2003); we only name the need of many female students to gain practical programming experience. In addition to curricular studies, the event may also offer insights into new technical developments, gender aspects, and soft skills. Courses may be offered by faculty from various universities and specialists from industry (who can both also attend courses) and also by graduate students.

3.2 Congresses and Conferences

Female-only congresses (FiNuT) and conferences (Grace Hopper Celebration, AusWIT, open to men) or restricted female-only spaces at open conferences (Haecksen at the CCC) are typically held every year or every other year. They have a similar structure to open conventions and conferences. Presentations are typically at most two hours, usually shorter. The content is often presented as theory instead of practical hands-on workshops. Congresses are, with three to four days length, on average shorter than summer universities; they have much larger numbers of attendees (up to several hundred). The topics presented at congresses and conferences range from all fields in IT to social science, from gender education to pedagogical advice for tertiary teaching.

4 Event Impact Evaluation

We examine the effect of initiating events on women in CS and IT communities as a first step to evaluate the effectiveness of these communities. We specifically focus on the personal impression of women from within the communities, their acceptance of the event or community, and the impact of the events and communities on their personal and professional lives. We do not seek to measure external parameters such as number of participants unless it has impact on the attendees.

We have performed three studies within which we (1) analysed questionnaires from the CWC, (2) conducted interviews with participants of several summer schools, and (3) analysed information on a shared web platform for summer universities. Here we report on the results of the studies and illustrate how the studies will contribute to the larger aim of evaluating and designing effective communities for women in CS and IT.

4.1 CWC Questionnaire

The CWC 2005 and 2006 were evaluated using questionnaires for both general questions and specifically for each course. In the context of this paper, we refer to the participants' answers for general questions about the CWC, especially the qualitative evaluation.

The questionnaire asked about: background of the participants, their attendance of the CWC (days, keynotes, courses, social events), courses they would like, information they received, time constraints for the congress, reasons for attending, plans to attend next year, general feedback about the congress. More than 50% of the participants of each year (CWC 2005 and CWC 2006) filled out the questionnaires.

As reasons for attending the CWC, we received the following feedback (on a scale from 1 to 6, with 6 being “applies very much”)

- improve their computer science knowledge: 4.7
- improve their teaching: 4.3
- meet other women in CS: 5.6

Additional answers showed political reasons, e.g., “to support the congress as I think it is a great initiative”, or the opportunities to see other universities, or to introduce people to the women’s own projects.

All except one person said that they would want to attend the congress in the next year. All would recommend attending to female colleagues or students. From these answers we conclude that the qualitative feedback the women gave is intended to further improve the event for them.

We now refer to the answers to the questions “What did you especially like about the CWC in general” and “What could have been better about the CWC in general”.

The positive feedback much focussed on the identification of role models (“brilliant personality and excellent skills”, “cool women”, “different possibilities for career”, “hearing peoples stories”, “different perspectives really exciting”, “the people”) and the open and friendly atmosphere (“relaxed style”, “women environment”). It was pointed out that one of the best things was to “find out that other women in IT exist.”

As for suggestions to improve the event, participants suggested more promotion to reach more people and to industry (“more would come if they knew about it”). It was also suggested to somehow include men, perhaps in a separate workshop about the issue of women in CS and IT (“men could really support this congress”).

4.2 Interviews

Typically, events like the ones considered here (conferences and summer universities) are evaluated a-posteriori using questionnaires (as described in Section 4.1 for the CWC). It has been long agreed by researchers that intervention programs need to be evaluated effectively. However, Craig (Craig et al. 2005) points out the difficulties of evaluating intervention programs for women in IT. It has been observed that evaluations of single events typically and inherently record only certain types of (short term) feedback, while missing the essence of the participants’ impression regarding the long term “usefulness” or “success” of the events.

To improve our general understanding of network and community building events for women in CS and IT, we conducted a number of interviews with attendees of several events. Events often bring about a certain atmosphere and excitement. We aimed at capturing the participants’ impression of the impact of the events on their “normal” life, i.e., outside the event or the immediate aftermath of the event. Consequently, the interviews were conducted over a three weeks period, in which the participants where not currently involved in attending or organising an event.

As reasons for attending the events, interviewees referred to the relaxed and open atmosphere that combined social and professional interaction, finding role models and “learning the ropes”, information about career options, and the interest to contribute to the community, e.g. by helping the organisation or as a role model.

As a result of our study, we identified the different experiences and expectations of participants of congresses/conferences vs. summer universities. We observe that both types of events find their different focus groups. Each event type has different advantages that may match better with women in different situations in their (professional) lives. The two event types fulfil different needs and should be purposefully selected when organising events for a given target group. For more details refer to Oelinger & Hinze (2006).

Some characteristics were discussed equally for both types of events. The question regarding the inclusion of presentations or workshops regarding gender politics and feminism lead to very controversial arguments and statements. A very wide range of answers was given regarding the fraction of courses and presentations that should (or could) focus on gender politics (“female-only events are inherently gender politics”). In our interviews, the atmosphere at a summer university was repeatedly described as “intense” but as “relaxed at the same time” (“feels that [she] does not need to prove herself as much as with male colleagues”).

Most of the participants expressed that they would not hesitate to contact other attendees of a summer university. Having been to the same summer university or conference is seen as a positive reference. Several lasting contacts were made for each participant. Close personal friendships were often formed after the second attendance of a summer university. This seems to indicate that summer universities are successful in initiating female networks. However, further evaluation is needed in the long terms effects and sustainability of these networks.

4.3 Wiki Analysis

A wiki (MediaWiki, 2002) has been set up to offer a secure web platform for attendees of the summer universities Informatica Feminale in Bremen and Furtwangen/Freiburg, Germany, as well as for attendees of the ditact women’s IT summer studies in Salzburg, Austria. The articles mainly refer to the summer university in Bremen, which may be due to the larger numbers of attendees and the long history of the event. The topics of the wiki are links to other summer universities, news (new sites within the wiki), dates (time schedule of different summer universities, including the time schedule of the Informatica Feminale in Bremen), Bremen as one of the universities’ sites (important and/or nice to know about the campus and the city), help (how to use the wiki), and the “core content”. Core content contains

- the profiles of women: participants, lecturers, program committee members (optional, each woman can write or not, much or little)
- learning material (scripts by lecturers or notes of participants)
- courses (wiki pages with information about or from courses at the summer university)
- information about programs of studies (personal reports and assessments, but also facts)
- images and texts (photos, quotations etc.)
- discussions about serious or nonsense topics
- link list (computer science, maths, natural science, web, research, women, feminism, beneficial links, fun, and games)

The wiki consists currently of 412 articles. The best liked page – apart from the main page – is “Upgrade To AJAX” from the summer university 2006. Last changes have been done in March 2007, which indicates that the wiki is still used (it was initiated in summer 2003). In 2006, women were interested in installing password protection for the wiki. Beside the wiki, the participants of the IF decided to employ the business community platform XING (Hinrichs 2004) for keeping in contact. There are currently 44 members in the XING group “Informatica Feminale”. This group here also includes several former participants who did not attend the IF event in the last two years, but followed the call to join this group.

Within the IF wiki, the list of profiles shows 47 items – most of them representing a single person each, but one groups the participants of a database course in 2006, and three further profile items refer to external websites. Thus, a total of 58 profiles is represented. We categorised these profiles following the inductive category formation recommended by Mayring (2003, p75). The found categories include not only facts like name, or a list of – attended or given – courses, but also personal assessments (e.g. of the summer universities, of the wiki itself, anticipation of the next summer university).

All women tend to list their courses or post information about their (research) biography; this holds slightly more for the participating-only students. One exception is the group of the participants from the database course who have used their wiki profile pages to back up their MySQL dumps.

In accordance to our findings from the interviews (Section 4.2), the women’s profile pages show that attendees tend to (re-)visit the summer universities several times. We find only a few women who attended different summer universities, but the main part attended the same event several times.

4.4 Research Design

Figure 1 shows how our studies will be used in a larger research context to evaluate effectiveness of female networks. We show how the user studies are a core part of our event impact evaluation. It has interactions with the results of literature analyses and the hypotheses we define and refine based on the results of each study. These components together guide our research focus. The current situation of women in CS/IT (identified in own and related studies) will serve as a constant reference and as test case for our research. We hope to consolidate our results into conformed findings with long-term impact.

Our current studies have focussed on only a subset of the studies that we devised: We were able to identify needs and expectations of participants and could draw first conclusions about the effectiveness of events.

Further studies will include organisers as well as focus on the situation of women in CS and IT in general. Based on the results of our studies, (questionnaires, interviews and media analyses), we identified the next steps of our work: further detailed interviews with participants, interviews with organisers of events, as well as long-term studies with women in CS/IT.

Since we focus on experiences and exploration of the field, we concentrate first on anecdotal evidence. Anecdotal evidence in this context means we record observations, named effects (by interviewees) and analyse network tools like wikis or other online community platforms, and mailing lists to investigate if our findings in the interviews and questionnaires are supported by findings in the analyses. We will then refine our theoretical model and thus give narrower further focus to our research and define our hypotheses for the long-term studies.

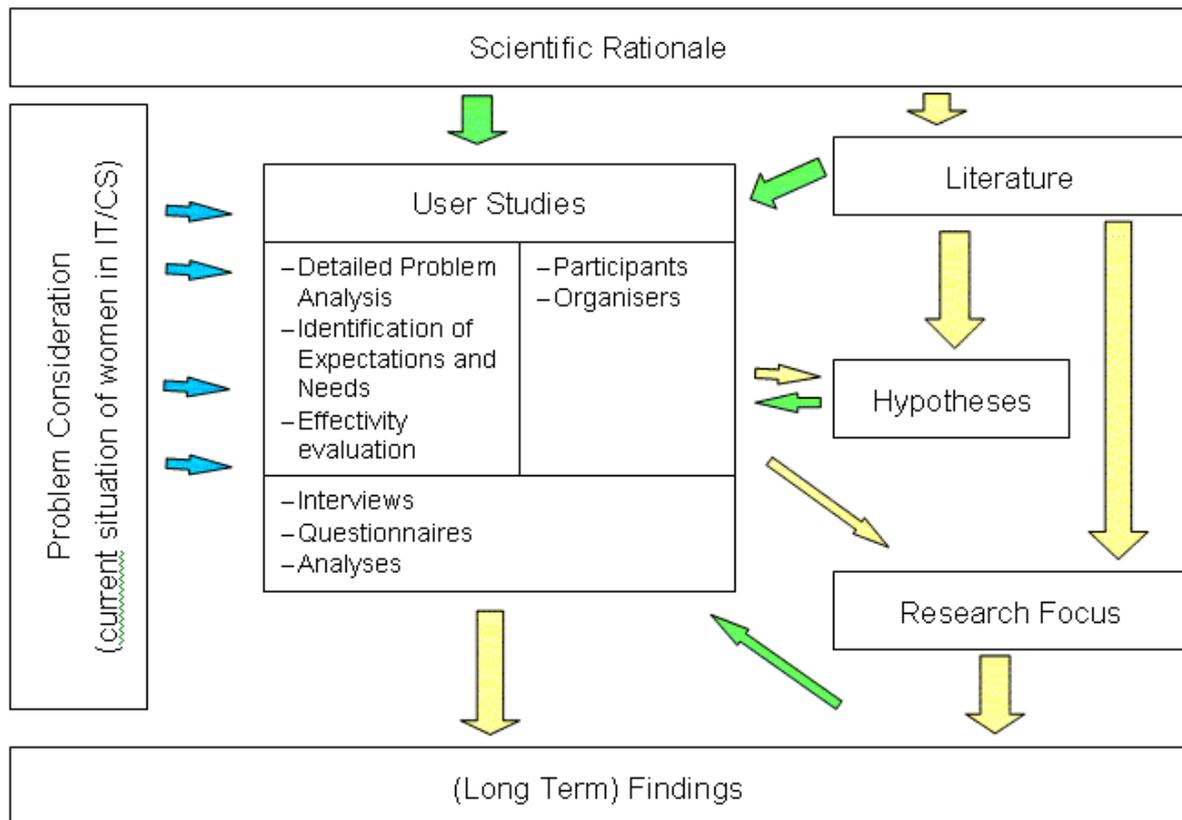


Figure 1: Research Design

We identify three main categories of interest concerning female CS/IT networks (see table). First, there are facts about the network which can be identified by the organisers and/or seen from the self description of the respective network. Secondly, there are questions to network members. Finally, there are facts which characterise the respective network as a whole.

Category	Instruments/Data Pool	Issue of interest (examples)
a) Network fact	<ul style="list-style-type: none"> • Interview (organiser) • Questionnaire (organiser) • Self description (website of the network, press releases etc.) 	<ul style="list-style-type: none"> • Specific vs. interdisciplinary • Size of the network (number of members) • Target group
b) Perception of network	<ul style="list-style-type: none"> • Interview (participant/member) • Questionnaire (participant/member) • Analysis (participant/member postings in wiki, mailing list etc.) 	<ul style="list-style-type: none"> • Anonymous vs. personal (up to friendship) • Career impact
c) Network analysis	<ul style="list-style-type: none"> • Analysis (compare with findings from a) and b)) 	<ul style="list-style-type: none"> • Policy • Spatial impact (e. g. transfer of the German concept to Austria or adapted concept from Germany to New Zealand; or, geographical extension of members' location)

Most of the networks maintain mailing lists for communicating dates (e.g. deadlines), organisational issues, and information considered interesting to the subscribers. The mailing lists are also used as a tool to stay in contact (with personal information such as pregnancies, finished PhDs, or new jobs). Other topics refer to technical, professional or functional questions. Often the importance of even such simple means of communication is especially experienced when mailing lists go offline for some time. The conversations often need to be re-initialised to let the communication flow start.

5 Findings

We evaluated different events, using three types of studies: questionnaires, interviews, and online data analysis. We found that the women tend to visit the same kind of event several times, forming lasting friendships and business connections. The interactions between the participants are continued during the rest of the year. Longer lasting connections are formed and maintained.

The encouraging and supportive atmosphere was always mentioned as an incentive to attend the events. However, successful participation often hinges on details and obstacles to overcome. We identified the following *obstacles for women to attend networking events*:

- distance to home town/working site/place of employment
- funding for travel cost and accommodation (especially for students)
- paid lecturing adds to lecturers' credit and eases argumentation at home university for being released from work
- time effort for professionals
- credibility

Credibility and funding were two major points that were discussed. As contributing factors to credibility were named: the payment of presenters of longer courses (that are accepted at university curricula) as “guest lecturers”; the reimbursement of their travel costs; support by major Computer Science Societies; acceptance of course results in the curricula; reviewing for accepted conference papers. Credibility was argued as being important for receiving funding/time off from employers or universities. Credibility was also argued as being important to the presenters as to not want to be seen to focus on a “hobby horse”.

We identified these issues for all types of events, independent of their geographical location and the background of the attendances.

We concur with the suggestions of the participants of our studies (questionnaires and interviews) for further events in CS and IT:

- Events at each level are required: international and cross-national; with and without men; broad audience (open for all professionals across all career levels) and career-related (for students, for PhD students, postdocs, full and associate professors, for business women); as well as high level of topics (international state-of-the-art research or best practice). It was asked that more professional women be available for conversation and as role models. There should be more room for discussions with these leaders of their fields.

- Political/Business activities for women in CS and IT are experienced as often ineffective and disconnected from community-internal activities such as summer universities and congresses. To change the situation of women, a different and more widely supported approach must be found. Participants named issues such as “more flexibility”, “more justice in payment and working conditions” and better support for families.

6 Conclusion and Future work

Friendship and professional support make the presented communities valuable for their members. The networks often originate in short face-to-face events where women work together in an intensive and demanding but also highly motivating and encouraging way. In this paper, we identified and analysed key factors for the success or failure of initiating events for female networks in CS and IT.

Successful events. As a result of our study we conclude that both forms of initiating events (universities and congresses) can be equally successful: congresses lead to larger and more loosely coupled communities with less personal contacts. Summer universities lead to smaller, closely connected communities where personal networks are formed. We conclude that both forms of networks and events are necessary. Participants often were part of several communities; forming their personal network of contacts through various professional communities. A few smaller issues were identified that could be improved for certain events (e.g., some technical courses or different gender topics). Participants identified as a major issue the need to personally meet role models and female leaders in their field. This is still not sufficiently implemented in existing events. In addition, the restricted funding for events was identified as a main problem.

Successful communities. The very first personal meeting often is crucial for lively communities. The event often determines the atmosphere of the community. That holds for both the social and the technical support that participants can find within the community. For the long-term success of the community, organisers of initiating events need to support

- communication within the community (e.g., by setting-up a mailing list and/or a wiki),
- special interests groups to form within the social structure of kick-offs and network events, such as minority meetings and other kinds of “meeting points”.

This evaluation is based on three small indicative studies; further evaluation is needed. No extensive evaluation is available so far, even though the topic has been discussed in several forums, e.g., in (Oelinger et al 2006, Craig et al, 2005, Margolis and Fisher 2003). Our next step in our analysis of female intervention programs in IT and CS is to identify the needs of women in IT and CS in different countries and on different career steps. This will allow us to further investigate the effects of existing programs and, if necessary, to design new types of events and communities.

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